

HISTORY OF AGRICULTURE IN COLORADO





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HISTORY OF AGRICULTURE IN COLORADO

A CHRONOLOGICAL RECORD OF PROGRESS IN THE DEVELOP-
MENT OF GENERAL FARMING, LIVESTOCK PRODUCTION
AND AGRICULTURAL EDUCATION AND INVESTIGA-
TION, ON THE WESTERN BORDER OF THE
GREAT PLAINS AND IN THE MOUN-
TAINS OF COLORADO

1858 to 1926

BY

ALVIN T. STEINEL

D. W. WORKING, COLLABORATOR



Published in Honor of the Fiftieth Anniversary of the
Admission of Colorado to the Union, by The State
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This work is dedicated to the pioneers who laid the foundation for a prosperous industry in an untried region, overcoming Nature's handicaps and breaking down the last barriers before the westward advance of American agriculture.

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FOREWORD

In the span of three-quarters of a century, an unknown region, a part of the "Great American Desert," has been explored, settled and developed into the commonwealth of Colorado.

Early travelers to the region had little thought of staying here. They planned to return to the States as soon as they made a "stake," or found the bodily vigor the climate was expected to give, but once here they found a new zeal in life, a greater opportunity and an appeal that was irresistible. The lure of the West that had drawn them across the plains held them, or clothed their experience with romance, with a longing to return if forced to leave. And so the miner, the soldier of fortune, the hunter and trapper, the stockman, the farmer, the professional man and the health seeker became community builders, assembled these communities into a territorial organization and in due time qualified this for statehood, making of the Pike's Peak country the state of Colorado.

Embracing, as it does, the highest portion of the continent and made up of almost equal areas of mountains and plains, with great diversity of soil and climate and a wealth of natural resources, the development of mining, agriculture, industry and transportation in this region presents many unique features of broad human interest, and the development of the state, county, municipal and school district governments is a credit to the self-governing ability of our people.

The records of early years are fragmentary and incomplete. Those who laid the foundations for our industrial and civic structure have been gathered to their fathers and the surviving pioneers of early statehood days are all too few. The historian who would trace our early history finds many difficulties.

Because of this, and because of the importance of agriculture in our economic life and the many different features presented in its development, the State Board of Agriculture authorized a history of agriculture as the contribution of the State Agricultural College to the semi-centennial celebration of statehood. The plan was approved in August, 1923, following some months of preliminary study.

It was realized that the history should be written by one who could bring to the task broad knowledge of Colorado, long residence and experience in the state and a sympathetic understanding of our rural people; and that he should have the aid of one or more trained investigators and

seek the co-operation of every individual and organization that might assist him in his work.

The task of organization and of general direction of the work was assigned to the writer of these lines.

Alvin T. Steinel, our specialist in rural development, whose broad knowledge of present agricultural conditions in Colorado, long editorial experience and training and taste for research fitted him admirably for this work, was appointed editor, and Dr. Daniel W. Working, investigator. He had wide experience and knowledge for this important part of the work. His service to the state in agriculture includes a term as Master of the State Grange, two years as editor of *The Colorado Farmer* in the nineties, and secretary of the State Board of Agriculture from 1893 to 1897; also many years in supervisory service for the Department of Agriculture, during which time he introduced county agent work in Colorado and other western states.

Dr. Working began his work in December, 1923, spending about two years in research, traveling to the places of earliest settlement and interviewing those who might throw light on their development. In addition to this work of investigation, Dr. Working wrote the chapter on Beginnings of Colorado Agriculture. The results of his investigations were turned over to Mr. Steinel, who supplemented these by extensive studies of his own and wrote the other chapters of the history.

From the first announcement of the plan to prepare this history by the State Agricultural College, it received general commendation and assistance. President A. A. Edwards of the State Board of Agriculture gave it every possible support. Former Governor E. M. Ammons, vice-president of the board, up to a few days before his death, assisted in gathering material. His great knowledge of the state made him an invaluable counselor. The members of the faculty and the librarian of the college have given generously of their time, and the farm organizations gave every possible assistance. The press of the state has been especially helpful, being most generous in permitting the use of early files.

Unstinted and effective co-operation was given by the Colorado Historical and Natural History Society, through Albert B. Sanford, Curator of the Historical Department, and Jean Allard Jeancon, Curator of Archaeology and Ethnology. Mr. Sanford's help proved particularly valuable because of his personal knowledge of and acquaintance with pioneers and pioneer conditions. As a boy, he knew the men and women who built the state's foundations, for his parents were among them. He saw the state's agriculture develop from the experimental stage to the status of dominating

industry, and he proved to be, therefore, a wise counselor and safe guide to authentic sources of information.

Mr. Jeancon's guidance was along archæological lines, especially relating to the extent of ancient irrigation and the practices and methods of the aboriginal farmers of the arid Southwest, including a large section of what is now Colorado. Mr. Jeancon, in his service for the Smithsonian Institute at Washington and lately as director of archæological and ethnological research for the State of Colorado, has unearthed evidences of agriculture by irrigation that throw new light on the life of the ancients. It was the inspiration of his work that enabled the author, in the chapter on irrigation, to give this historical record its proper setting, fixing a new mark for beginnings that takes nothing from the record of achievements of the recent Anglo-Saxon settlement, but leaves for the present generation of students, an impressive lesson as to the age of the so-called new world and the stage reached by civilizations that have vanished.

We present this narrative of our agricultural development to the fiftieth anniversary of statehood in the hope that, in part at least, it fulfills its purpose: that of showing as far as possible from first-hand information the conditions that faced our first settlers and how they met them, of tracing the different branches of the industry through their various phases from their beginnings to the present, of showing how agricultural education and investigation were provided, supported and utilized, and how legislation and state-supported service kept pace with changing needs and made possible further advance.

Its preparation was a labor of love, in grateful appreciation of the men and women whose courage, ability, vision and love of adventure made possible our commonwealth of today, who, in their work and in their plans, reflected the generous expanse of our plains and the sturdiness and sublimity of our mountains.

Geo. A. Lory

ACKNOWLEDGMENT

The authors desire to make grateful acknowledgment to those who were especially helpful in supplying material and aiding, through suggestions and advice, in the preparation of this volume. First of all we owe a debt of gratitude to Dr. Charles A. Lory, president of the State Agricultural College, under whose personal supervision the work was done. He assumed executive responsibility for the project which he conceived; and he directed the details, giving counsel frequently, and deciding questions on important phases of the work as these arose. Finally, it was his task, also, to read the finished manuscript, in order to insure that the work might at least approximate the ideal of his conception.

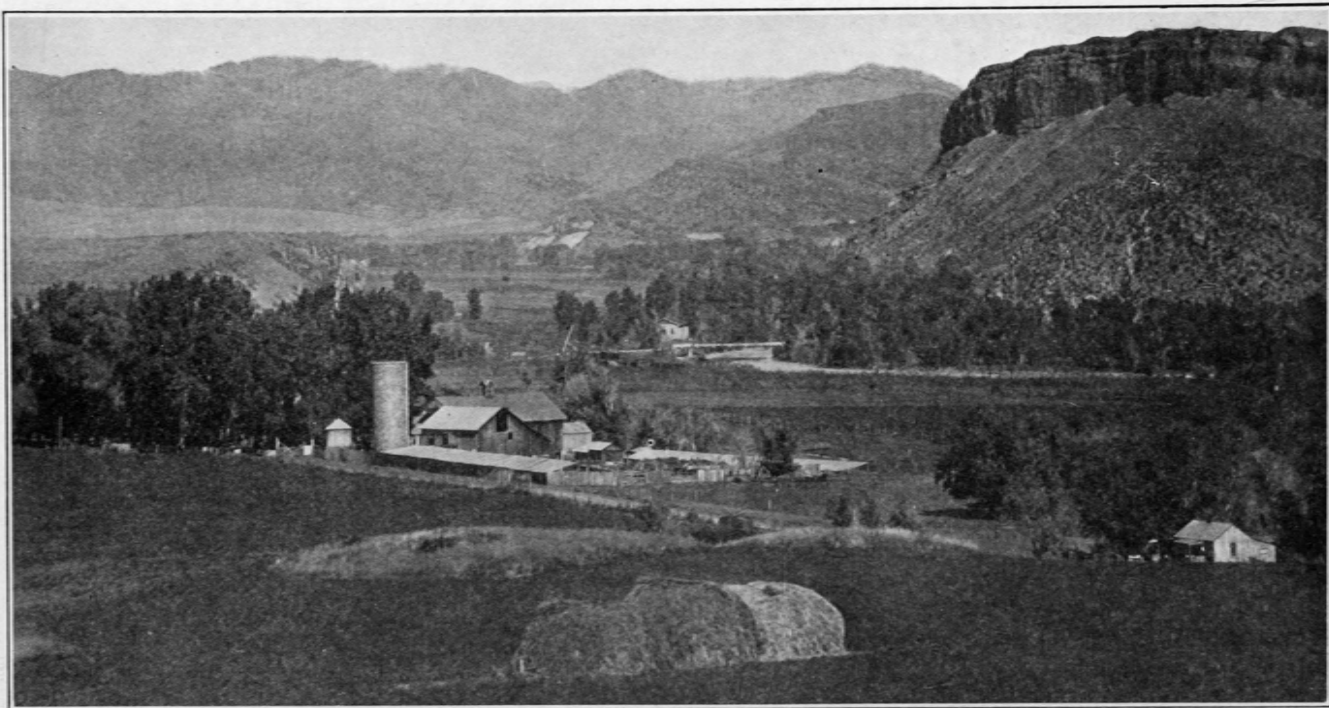
Other members of the faculty of the Agricultural College who gave active aid by counsel and in assembling material, or in reviewing data or particular portions of the manuscript, were Alvin Kezer, Edward B. House, Charles I. Bray, E. P. Sandsten and Charlotte A. Baker.

Among those outside of the college organization who gave special help were Lucius M. Wilcox, John Painter, Walter H. Olin, A. Lincoln Fellows, the late Avery C. Newton and the staff of the State Historical and Natural History Society. All realized the public nature of the project and their aid was given freely as a service to the people of Colorado.

THE AUTHORS.

Contents

Chapter	Page
I. BEGINNINGS OF COLORADO AGRICULTURE.....	11
II. RURAL LIFE OF THE PIONEER PERIOD.....	47
III. EARLY YEARS OF STATEHOOD.....	73
IV. THE SETTLER AND THE INDIAN.....	91
V. THE RANGE LIVESTOCK INDUSTRY.....	107
VI. MYTHICAL GREAT AMERICAN DESERT VAN- ISHES WHEN IRRIGATION BEGINS.....	167
VII. DRY LAND FARMING COMPLETES CONQUEST OF PLAINS.....	245
VIII. HISTORY OF SUGAR BEET PRODUCTION.....	281
IX. THE ECONOMIC DEVELOPMENT OF AGRICUL- TURE	311
X. AGRICULTURAL COLONIES AND COLONIZATION OF LABOR.....	383
XI. CROP CHRONOLOGY AND EVENTS OF IMPORT TO AGRICULTURE.....	411
XII. DEVELOPMENT OF FRUIT AND VEGETABLE GROWING	501
XIII. UNITED STATES RECLAMATION PROJECTS....	527
XIV. PRACTICAL APPLICATION OF RESEARCH AND EXPERIMENTATION	541
XV. AGRICULTURAL EDUCATION.....	583



Scene of the "Cache la Poudre." Pleasant Valley, 8 miles from Fort Collins, one of the oldest farming sections of Colorado. The Cache la Poudre leaves the mountains here, the river flowing at the foot of the natural rampart on the right. In the field at the left is "the hiding place of the powder" from which the Cache la Poudre gets its name. French trappers here cached their supplies, including powder, and returned from an expedition up the river, to find everything safe. (Photo by Grant Eddy.)

CHAPTER I

Beginnings of Colorado Agriculture

BY D. W. WORKING*

THE PLAY OF GEOGRAPHICAL INFLUENCES

To get the meaning of the story of the beginnings and the development of agriculture in what is now the State of Colorado, one needs to consider the geography of the western half of the United States. It is not enough to have in mind the country as it is represented on the maps of the present day. We must take into account the West as it was represented on the maps of a century ago; for the actions of men are influenced by what they know or think they know, not by the actual facts that exist unknown to them. The movements of the explorers and other adventurers in the early part of the nineteenth century were determined by the scant knowledge of their time, not by the abundant information possessed by the people after the first railroads had been built to the Pacific.

Studying the West as it was vaguely understood as a result of the Lewis and Clark Expedition in 1804-5; the expedition of Pike in 1806-7, that of Long in 1819-20, and the Fremont expeditions of 1842 and 1843-4, one realizes that no one could have had more than a very imperfect knowledge of the region now known as Colorado. And when one adds to this general study of the Far West a careful examination of the drainage of the Rocky Mountain region, he will realize that it was but natural that the lines of travel through the prairie and mountain country should have resulted in delaying the settlement and development of Colorado until after most of the neighboring states had made considerably greater advancement. The river system of Colorado has its own story to tell to those who would understand the forces that determined the beginnings of agricultural development within the borders of a state that was not even a named territory when this development began. And it is to be understood that the meaning of our rivers has changed. Their relation to our recent growth and the progress toward which we confidently look took on a different meaning, even before the railroads began to be substituted for the older means of "overland" travel and traffic; but this must be left for later discussion.

RIVERS AS GUIDES.—The nature and the great elevation of the country where the principal rivers of Colorado have their beginnings furnished

*Chapter I was written by D. W. Working. The succeeding chapters were written by Alvin T. Steinel.

one of the principal problems of the early explorers, adventurers, and travelers. The rivers were guides and also warnings. "Not this way!" they must have seemed to say to many a hardy explorer and hunter. And the wise adventurers understood: if they could not go up the river canons and across the high passes of the great white mountains, they could go around; and around they went. It is not to be overlooked that the mountains, valleys and plains of Colorado were not of primary interest to most of the explorers* already mentioned and to the many others who traversed the mysterious West during the period covered by their explorations and down to 1860. The great attractions then were in the Far Northwest, in California, and in the Southwest, including part of Mexico as it is known today. And because the mountains of Colorado were the highest and most difficult of passage to the points of their destination, the travelers to the West needed to know something of the geography and topography of the central mountain region. The little they knew taught them to go around—to go up the Missouri to the Oregon country; up the Platte to Julesburg and on to Fort Laramie and beyond through the low passes of what is now Wyoming to Utah and the mountains and gold-laden streams of California; by the Santa Fe Trail† to old Santa Fe and Taos, and from these settlements to the Southwest beyond.

The Colorado River of the West gathers its first waters within the limits of Middle Park, the northern rim of which approaches within forty miles of the northern boundary of Colorado at a point almost exactly midway between the eastern and western boundaries. From the park it flows southwesterly, passing out of the state of its origin a short distance south of the middle point on the western boundary line. This noble river gathers to itself all of the drainage of Colorado west of the crooked Continental Divide and sends it across the southeast corner of Utah and the northwest corner of Arizona, and then down to the Gulf of California, to mingle with the waters of the Pacific Ocean. Just across the northern rim of Middle Park the sources of the North Fork of the Platte are found in North Park, whence that stream flows northward until half way across Wyoming before turning to the east and southeast to unite with the South Fork in Nebraska. Across the southern rim of Middle Park the headwaters of the South Fork of the Platte are found in South Park.‡ On the west and north of this park are found a number of the very high mountains of Colorado. With

*See H. M. Chittenden's *The History of the American Fur Trade of the Far West*.

†The old Santa Fe Trail led from Independence, Missouri, to Council Grove, Kansas, and on to the ford of the Arkansas just east of the 101st meridian, and then in a practically straight line to Santa Fe; or it continued up the Arkansas to La Junta, Colorado, and then in an almost direct line to Raton Pass and down to Santa Fe, joining the more direct trail near the crossing of the Moro River.

‡The Bayou Salade of early explorers and trappers.

its tributaries the South Platte drains the highest peaks of Colorado north of Mount Massive—Lincoln and Long's and Gray's and the great shouldering bulk of Mount Evans and its neighboring summits. However, the Colorado shares with the Platte the honor of draining these high peaks, and with the Arkansas the privilege of carrying the surplus water from the highest summits in the state—Massive and Elbert. From its source near Leadville the Arkansas, for about seventy miles, flows only a little east of south, and from near Salida it flows slightly south of east to Canon City, where it leaves the mountains to continue its easterly course and pass out of Colorado a hundred miles north of the southeast corner of the state, meanwhile passing the historic spots known in the early days as Fort Reynolds, Fort Bent, and Old Fort Lyon. Across from the narrow valley of the upper Arkansas is found the southern of the great chain of parks that extends across the state of Colorado—the San Luis Valley, largest and most fascinating of them all. Here are found the extreme northern sources of the Rio Grande del Norte, the main branch originating in the extreme western side of the valley, where the Uncompahgre and San Juan ranges carry the Continental Divide farther west than it is found elsewhere in Colorado. This important stream flows practically south from about the center of the valley at Alamosa, and leaves the state at a point midway between its eastern and western borders. Like the Colorado, this is an international* river; which fact has brought problems to the State of Colorado and the nation—and these will call for later consideration.

ON THE MOUNTAIN TOP.—Thus, judged by the directions of the flow of her rivers, Colorado is at the top of the western part of the United States. It is a region of high mountains, elevated mountain parks and valleys, and of broad plains country, sloping down to Nebraska, Kansas, Oklahoma, and New Mexico. On its more mountainous sides it slopes down to Wyoming, Utah and New Mexico. In the great elevation of Colorado lies at least in part the reason for the course taken by exploration and settlement of the western plains and mountains. The rivers marked the earliest travel routes—except where river canons were too difficult. The first explorers looked for ways to get beyond the mountains of the great region which later came to be known as Colorado. Lewis and Clark went up the Missouri in 1804 to find a way to Oregon; Pike traveled up the Arkansas in 1806 until the mountains turned him south, to become a prisoner in the hands of Spanish forces who took him to Santa Fe; and Fremont† in

*The Colorado River flows through a portion of Mexico before reaching the Gulf of California; and the Rio Grande from El Paso to Brownsville forms the boundary between the United States and Mexico.

†Fremont's second expedition, in 1843, followed the Kansas River for some distance, and arrived again at Fort St. Vrain by crossing from the headwaters of the Smoky Hill to the South Platte below the mouth of Beaver Creek; and the following year he returned through North Park, South Park and across into and down the Arkansas.

1842 followed up the Platte to Fort St. Vrain, and then to Fort Laramie and on. Later, when the Mormons crossed the mountains to Utah and when the Argonauts journeyed to the gold diggings of California, they avoided the heights of Colorado. When the period of railroad building arrived, the same influences determined the routes. The Union Pacific survey touched Colorado at Julesburg, but turned northward and crossed the hump of the continent by way of southern Wyoming; and when the Atchison, Topeka & Santa Fe route was fixed upon, it led up the Arkansas into Colorado to turn to the southwest at La Junta, and thence across the Raton Mountains to pass over the Continental Divide in western New Mexico. So, just as the old stage routes crossed the mountains to the north and the south of Colorado, the main railroads found easier passage to the western edge of the United States. Thus it would seem clear that the settlement and development of Colorado were appreciably retarded by the great elevation of our mountains and the difficulties offered by our mountain streams.

But the influences that were so effective in turning the routes of travel far aside from the now important centers of population and wealth came in time to have decreasing power; and the economic forces to the north and the south and in the extreme west, which seem to have reinforced the tendency to bend the trade routes around Colorado, have greatly changed. There are signs that it may be cheaper and better for railway traffic to go under the mountains rather than around them; and some day those who feel that Colorado should have furnished the original routes for travel and trade between Missouri River points and Salt Lake City and San Francisco may find that the Centennial State is on the main road across the western half of the continent.

THE PERIOD OF THE EXPLORERS

Agriculture in Colorado is much older than the permanent settlements that were established shortly after the discovery of gold in 1858. At this time, and for several years, much of what is now Colorado was vaguely known as "Pike's Peak" or "the Pike's Peak country." And these settlements at and near Denver, so far as we may think of them as made up of men interested in stock raising or farming, were not to any considerable extent established by people who had seriously made up their minds to build homes, develop farms, and organize communities in a region of known agricultural productiveness. The men who were later known as the pioneer farmers and stockmen of Colorado had come to the country with the fever of adventure in their blood. Most of them were looking for gold and for new and exciting experiences, not setting out on the higher

adventure of establishing farm homes and rearing families and organizing schools and churches as the basis of a new state in the remote West. But some of them saw opportunity in agriculture, and some recognized the need of providing a dependable food supply nearer than the Missouri River; and some found that they knew much more about farming and gardening and stock raising than they did about mining, and so took up the way of living and making a living that they had learned on old and new farms in many states and some foreign countries. Agriculture became another form of adventure in a new country. And as it was different from what they had known, it was worth trying—at least for a season. This was the beginning of agriculture north of the Arkansas and east of the Continental Divide while the stream of adventurers came to dig for gold or otherwise find experience or fortune in the mountain country.

In their search for gold and adventure, men found opportunities in stock raising and crop growing; and as these opportunities became known to more and more people, and as, year by year it was being proved that farming and stock growing could be made profitable, men of serious purpose deliberately made up their minds to establish farms in what was then a part of Kansas Territory at the eastern base of the Rocky Mountains.

BEGINNINGS FURTHER BACK.—But there had been beginnings further back. And the story of these beginnings, as it can be pieced together from the fragmentary accounts of many travelers and government explorers, is worth considering as a preparation for the account of the more orderly development that had its beginning after Denver and Golden had been settled. After the travels of the early Spanish adventurers, which yield very little information regarding the agricultural possibilities of Colorado, the first famous American explorer of Colorado was Lieutenant Zebulon Montgomery Pike, who journeyed up the Arkansas in the fall and winter of 1806, and across the mountains from Pike's Peak to the San Luis Valley in January, 1807.

Pike seems to have seen nothing of agricultural promise; he could not well have done so at the season he came. Later travelers, such as Long and Fremont and others less well known, did make observations of real agricultural value. They observed crops and stock; and their occasional and more or less incidental references to farming operations and farm and stock products furnish trustworthy information concerning the simple farming carried on before 1860. There were many hunters and trappers passing through the mountains and along the river valleys in the years from about 1820 to 1845—or during the period when the fur trade was at its maximum in the United States. These hunters and trappers were good, if somewhat uncertain, customers of those who had flour, bacon,

sugar, coffee, salt and tobacco for sale; and there were real inducements at favorable points for men to engage in pioneer farming to supply the demand along the trails.

GREW GRAIN IN 1839.—Where there was demand for corn and wheat and other products, there someone was likely to undertake to satisfy it—perhaps by establishing a trading-post and freighting merchandise from the river; possibly by growing part of the products in demand. Indeed, Farnham* in 1839 mentioned that a company of American and Mexican trappers had undertaken to raise grain and vegetables on the Arkansas five miles above Fort Bent. Farnham seems to have been a keen observer. He remarked that the “Arkansas, some four or five miles above the post, can be turned from its course over large tracts of rich land,” and that “these individuals might realize the happiest results from their industry.”

Because of the “looseness of the soil and the scarcity of rain,” Farnham thought it was impossible “to raise anything thereabout without irrigation; and, as this is the only spot, for a long distance up and down the Arkansas, where any considerable tracts can be watered, they could supply the market with these articles without any fear of competition.”

FREMONT'S SCHOLARLY ACCOUNT.—Next to Pike, Fremont was the most noted of the explorers who wrote of their observations in territory now included within the limits of Colorado. Fremont was a scholarly soldier, with the gift of writing an interesting story. Unfortunately, his account of his first experience after crossing from Nebraska into what is now Colorado territory and journeying up the Platte River from Lodge Pole Creek was not a true description of normal conditions. Apparently the people who read his report a few years later could not realize that what was true on the sixth and seventh days of July, 1842, was not necessarily characteristic of the country we now know as the rich and pleasant valley of the Platte River.

The impression of the country traveled over today was one of dry and barren sands.

This was July 6, 1842; and the notes for the following day include the “desert” idea, as below:

Nothing of interest occurred during the morning. The same dreary barrenness, except that a hard, marly clay had replaced the sandy soil. Buffalo absolutely covered the plain on both sides of the river, and wherever we ascended the hills, scattered herds gave life to the view in every direction. A small herd of wild horses made their appearance on the river bottoms.

Add to this that Fremont reported that his thermometer stood at 103° at noon, and that on July 8th he reported a temperature of 108°, and it need not be surprising that some readers with little discrimination should picture the whole western country as one of “dry and barren sands” and

*Travels on the Great Western Prairies, p. 173.

excessive heat, and that most of them should think "desert" without wondering whether or how countless buffaloes could subsist without grass, or why they were there in such numbers. They doubtless did not undertake to explain to themselves the presence of wild horses—animals usually supposed to have the intelligence to look for pasturage where there is something to eat.

SQUAW-MEN PICKED RICH LAND.—Fremont continued this, his first journey in Colorado, traveling up the Platte toward Fort St. Vrain, near the mouth of the St. Vrain River. Seven miles above the mouth of the Bijou he came upon the camp of "some four or five whites" whom he took to be New Englanders who had gone with Captain Wyeth to the Columbia. Here they were—"independent trappers,"* as Fremont calls them. All were living with squaws; and the explorer was "really surprised at the number of little, fat, buffalo-fed boys that were tumbling about the camp, all apparently of about the same age—about three or four years old." He noted that these white men and their families were encamped on a rich bottom, "covered with a profusion of fine grass, and had a large number of fine-looking horses and mules." A few miles above this camp, the party came to Chabonard's camp on an island in the Platte; and on the heights above this island Fremont met the first Spaniard he had seen in the country. He noted that Mr. Chabonard was in the employ of Bent and St. Vrain's company. Apparently the island dweller was not entirely without agricultural resources, for "one of the people was sent to gather mint," with the aid of which a "very good julep" was concocted. Fremont spent the night at this place, which was called St. Helena. His story for the following day may be given in his own words:

July 10—We parted with our hospitable host after breakfast the next morning, and reached St. Vrain's fort, about forty-five miles from St. Helena, late in the evening. This post is situated on the south fork of the Platte, immediately under the mountains, about seventeen miles east of Long's Peak. It is on the right bank, on the verge of the upland prairie, about forty feet above the river, of which the immediate valley is about six hundred yards wide. The stream is divided into various channels by small islands, among which it runs with a swift current * * *. At the fort we found Mr. St. Vrain, who received us with much kindness and hospitality. * * *

PLATTE VALLEY A GARDEN.—In his notes for July 12th, Captain Fremont states that, through the kindness of Mr. St. Vrain, he was enabled "to obtain a couple of horses and three good mules"; also that he had not been able to secure anything "in the way of provisions." On the morning of that day they proceeded on their way, their road lying down the Platte valley, "which resembled a garden in the splendor of fields of varied flowers." In about ten miles, after crossing Thompson's creek, they came to the Cache a la Poudre, "a very beautiful mountain stream, about one hundred feet wide, flowing with a full, swift current over a rocky bed."

*Fremont's Report, page 30.

From his halt at noon on the Cache la Poudre, Fremont went on up that fine stream, turning from it after entering the mountains to go to Fort Laramie. The diary has much geographical interest, but no further information pertaining to any form of husbandry.

In June, 1843, Fremont was again in Colorado; and in the account of his trip he mentioned crossing a range of "rolling hills" on the afternoon of the 30th and finding himself overlooking the Platte Valley* a short distance below the mouth of the Beaver, from which point they went up the Platte to the Bijou, where they camped that night. At noon on the Fourth of July, Fremont and his party arrived at Fort St. Vrain, where Mr. St. Vrain received them "with his customary kindness" and invited them to join him in the feast prepared for the day. On the 6th Fremont was again on the road up the Platte; and his notes for that day have a very special meaning for this history, as follows:

THIS WAS LUPTON'S FORT.—Passing on the way the remains of two abandoned forts (one of which, however, was still in good condition), we reached in 10 miles, Fort Lancaster, the trading establishment of Mr. Lupton.† His post was beginning to assume the appearance of a comfortable farm; stock, hogs, and cattle were ranging about on the prairie; there were different kinds of poultry; and there was the wreck of a promising garden, in which a considerable variety of vegetables had been in a flourishing condition; but it had been almost ruined by the recent high waters.‡

The first camp after leaving St. Vrain's fort was made sixteen miles up the Platte; and the following morning, a few miles farther up the river, they came to a populous Arapahoe village "encamped in a beautiful bottom, and consisting of about 160 lodges." From the appearance of the village, Fremont conjectured that the Indians must have "a regular supply of the means of subsistence." Whether this indicates that they were raising corn and other crops there seems to be no way of knowing.

Following up the Platte and (apparently) Plum Creek, on the 9th Fremont arrived almost at the top of the Divide. He then turned eastward, crossing the upper sources of Cherry Creek, the Kiowa, and the Bijou. He noted the abundance of "luxurious grass, flowers of all colors, and timber of various kinds." On the 11th the party followed the Bijou to its head in a broken ridge at an estimated elevation of 7,500 feet.

This is a piney elevation, into which the prairies are gathered, and from which the waters flow, in almost every direction, to the Arkansas, Platte, and Kansas rivers; the latter stream having here its remotest sources§ * * * The soil of all this country is excellent, admirably adapted to agricultural purposes, and would support a large agricultural and pastoral population¶ * * *

*"A broad and misty valley, where, about ten miles distant, and 1,000 feet below us, the South Fork of the Platte was rolling magnificently along, swollen with the waters of the melting snow."

†Lancaster P. Lupton, who had resigned as a first lieutenant in the U. S. Army to engage in the fur trade. He built the fort in 1836 or the next year. It soon came to be known as Fort Lupton.

‡Fremont's Report, page 111.

§Fremont was in error here; what he took to be the "remotest sources" of the Kansas were the beginnings of the Big Sandy.

¶Fremont's Report, page 114.

It is worthy of note that, on the night of July 9, 1843, Fremont pitched his camp near the road running from St. Vrain's fort to the Arkansas; that on the 12th he reached "the wagon road to the settlements on the Arkansas River"; and that on the 13th he passed near the encampment of a hunter named Maurice,

who had been out into the plains in pursuit of buffalo calves, a number of which I saw among domestic cattle near his lodge.

DOWN THE FONTAINE.—From this point the expedition continued down the river (Fremont wrote it Fontaine qui Bouit), and at noon on the 14th encamped at its mouth on the Arkansas. Here again the exact words of the explorer give special emphasis to his agricultural observations, as follows:

A short distance above our encampment is a pueblo (as the Mexicans call their civilized Indian villages), where a number of mountaineers, who had married Spanish women in the valley of Taos, had collected themselves together, and occupied themselves in farming, carrying on at the same time a desultory Indian trade. They were principally Americans, and treated us with all the rude hospitality their situation admitted; but as all commercial intercourse with New Mexico was now interrupted, in consequence of Mexican decrees to that effect, there was nothing to be had in the way of provisions. They had, however, a fine stock of cattle, and furnished us an abundance of milk.*

On July 23rd Fremont was again at St. Vrain's fort, where he found that meat was scarce. However, he remarked that "two very small pigs, which he obtained at the fort, did not go far among forty men." But the fact does go far, and indicates that Lupton was not the only man who was raising pigs on the Platte in 1843. Before continuing on his journey to the Northwest, Fremont engaged the services of Alexander Godey,

a young man about 25 years of age, who had been in this country six or seven years, all of which time had been actively employed in hunting for the support of the posts, or in solitary trading expeditions among the Indians.†

In June of the following year Fremont was again in the country that was to become Colorado, having come down through North Park, and thence through Middle and South parks into the valley of the Arkansas. The following paragraph seems to indicate that other stock than horses and mules were kept at Bent's fort, besides mentioning a settlement new to the explorer:

After several days laborious traveling, we succeeded in extricating ourselves from the mountains, and on the 28th encamped immediately at their foot, on a handsome tributary‡ of the Arkansas. In the afternoon we descended the stream, winding our way along the bottoms, which were densely wooded with oak, and in the evening encamped near the main river. Continuing the next day our road along the Arkansas, and meeting on the way a war party of Arapahoe Indians (who had recently been committing some outrage at Bent's fort, killing stock and

*Page 116.

†Fremont's Report, page 120.

‡Probably Beaver Creek.

driving off horses), we arrived before sunset at the Pueblo, near the mouth of the Fontaine-qui-bouit River, where we had the pleasure to find a number of our old acquaintances. The little settlement appeared in a thriving condition, and in the interval of our absence another had been established on the river, some thirty miles above.*

On June 30th Fremont left the Pueblo and continued his journey to Bent's fort, where he stayed several days before proceeding eastward "along a broad wagon road" down the Arkansas.

SAW WIDE CORN FIELDS.—In *The Oregon Trail*, Parkman tells of the "welcome sight" which greeted† his party from the edge of a hill overlooking the Arkansas, which "ran along a valley below, among woods and groves, and nestled in the midst of wide cornfields and green meadows, where cattle were grazing." Here they saw the "low mud walls of the Pueblo." When they passed out of the gate of the village on leaving, they were able to "look down the little valley of the Arkansas; a beautiful scene"—doubly beautiful to them after long experience with deserts and mountains.

Tall cottonwoods lined the river, with green meadows on either hand; the high bluffs, quietly basking in the sunlight, flanked the narrow valley. A Mexican on horseback was driving a herd of cattle towards the gate, and our little white tent, which the men had pitched under a tree in the meadow, made a pleasing feature in the scene. When we reached it, we found that Richard‡ had sent a Mexican to bring us an abundant supply of green corn and vegetables, and invite us to help ourselves to whatever we wanted from the fields around the Pueblo.§

The following year (1847) Frederick Ruxton passed that way, and described the Pueblo as "a small, square fort of adobe, with circular bastions at the corners, no part of the walls being more than eight feet high." Inside the yard or corral were built "some half-dozen little rooms," which were inhabited by as many Indian traders and mountain-men.

They live entirely upon game, and the greater part of the year without even bread, since but little maize is cultivated.||

A SETTLEMENT IN '47.—Thomas Fitzpatrick is said by Smiley to have reported as Indian Agent from Fort Bent, in September, 1847, as follows:

About 75 miles above this place, and immediately on the Arkansas River, there is a small settlement, the principal part of which is composed of old trappers and hunters; the male part of it are mostly Americans, Missouri French, Canadians, and Mexicans. They have a tolerable supply of cattle, horses, mules, etc.; and I am informed that this year they have raised a good crop of wheat, corn, beans, pumpkins and other vegetables. They number about 150 souls, and of this number there are about 60 men, nearly all having wives, and some have two.||

Smiley states that in August, 1846, a company of about eighty Mormons arrived at the Pueblo on their way to Utah, later being joined by as many more. In the following May they renewed their journey, except two families who remained. This may account for part of the difference in the estimates of Ruxton and Fitzpatrick.

*Fremont's Report, page 187.

†*The Oregon Trail*, chapter XX.

‡"A little, swarthy, black-eyed Frenchman" first met near Fort Laramie.

§Parkman, *The Oregon Trail*: Boston, 1847.

¶Ruxton, *Life in the Far West*.

||Smiley, *History of Colorado*, pages 177-8.

THE DODGE EXPEDITION.—In 1835 Major Henry Dodge had made a military expedition into the mountain country. Lieutenant Kingsbury kept the journal. In his record for July 28th, Kingsbury noted that they visited the Fontaine qui Bouille, “or spring that boils,” and the next day he reported the arrival at the camp of two Spaniards from Taos, who had come to trade with the Indians. “Their stock, which consisted of whiskey and flour, they had left on the opposite side of the Arkansas”—which may be taken as an indication that neither of these articles was produced on the Arkansas at that date.

CAPTAIN GUNNISON’S EXPLORATIONS.—When Captain J. W. Gunnison’s expedition passed up the Arkansas in the summer of 1853, Bent’s fort was visited, but nothing noted regarding any agricultural products of the vicinity. However, on August 6th, Lieutenant Beckwith of the party, traveling in the direction of the Spanish Peaks, “struck a wagon trail leading from the Raton Pass to the Pueblo on the Arkansas River” and on north.

Following this trail * * * we were gladdened by the sight of a herd of cattle and horses feeding, and were soon in the camp of a trader from New Mexico returning from Fort Laramie. * * * Passing over another sharp ridge, we descended in two miles to the fine little valley of the Greenhorn, a stream of two feet in width and three or four inches in depth, which is now entirely diverted from its channel and employed in irrigating the lands of the six New Mexican families who reside at and constitute the present population of the place. They plant a few acres of corn and of wheat, of beans and of watermelons—in all, an area equal to that of the farm of a small eastern farmer, who cultivates his own fields. Two hundred fanegas* of wheat and fifty of corn, with the requisite amount of beans and melons, constitute the largest total crop of this valley.†

FORT ON THE GREENHORN.—Mrs. Alexander Hicklin, who, with her husband (“Zan”) settled on the Greenhorn in September, 1859, stated on October 10, 1924,‡ that there was an old fort on the Greenhorn in 1859, built by Frenchmen. There was also a string of log cabins. Mrs. Hicklin§ seemed to be clear in her memory of a water power from a big spring and an old mill, the mill-stones being afterwards used for grind-stones. Mrs. Hicklin’s testimony confirms the Beckwith account.

On August 13, 1853, Captain Gunnison, with a small party, arrived at “Mr. Williams’ herd-grounds on the Sangre de Cristo. * * * They dined with the master of the rancho on milk and tole, or parched corn-meal pudding, and slept under his awning on buffalo robes.” On the 15th

*The fanega is equal to two bushels.

†Beckwith’s Report, p. 35.

‡Interview with D. W. Working and L. B. Sporleder.

§Mrs. H. was a Bent, daughter of Governor Charles Bent, killed in the Taos Rebellion, January 19, 1847. As Estefana Bent, she married Hicklin October 20, 1855, when she was 21. At the age of 90 she was seen sewing without glasses. In 1878 she was given title to 5,118 acres of land of the Vigil and St. Vrain Grant, this grant having been confirmed by Act of Congress approved June 21, 1860.

Beckwith started for Taos for information. His observations on this trip are noteworthy because they support the statements concerning early agricultural settlements in the San Luis Valley.

A ride of twenty miles* further brought us to the Culebra or Snake Creek. There is a small settlement five miles to the east of the point where we crossed the stream near the mountains; but without visiting it we continued our journey, and arrived a little after dark * * * at the Costilla, a stream similar to the last, on which a new settlement is opened and a few fields are already covered with crops of corn, wheat, oats, and the other usual crops of a New Mexican farm.†

VILLAGE ON THE CULEBRA.—Less than two months before another Government expedition had entered the San Luis Valley, and it became necessary to send to Taos for supplies. It was the diarist of the expedition, with a few companions, who made the trip. On the night of July 4, 1853, Mr. Heap arrived "at a small village on the Culebra, inhabited by Mexicans." Although it was midnight, Mr. Heap was "invited into one of the huts, where a couple of women commenced at once baking tortillas" and otherwise preparing for his needs and those of the members of his party who were to come in the morning.

July 5—Before daybreak the house was invaded by lambs, kids and pigs, and all further attempts at sleep were in vain. Glad to escape from their noise, I got a horse and rode to the upper hamlets of the Culebra. The valley here spreads out in a meadow, a perfect sea of verdure, several thousand acres in extent, on which were numerous herds of cattle and horses.‡

The same day, on the Costilla, Mr. Heap observed "numerous farms, which are skillfully irrigated, but in other respects are cultivated very carelessly by the Mexicans; however, their crops, consisting of wheat, corn, beans, and peas, gave promise of better results than those on the Culebra." But here we have come to a region of permanent settlement, the first within the limits of the present State of Colorado—and that must be another story.

THE SETTLEMENTS THAT VANISHED

Agricultural pioneering has its tragedies as well as its triumphs. There is reason for pride in the men who conquered the wilderness for themselves and those who were to come after them. We are justly proud of those of our race who took the risks and endured the privations of the early days and were strong enough to live through the dangers and on into the times that brought them substantial rewards in goods and friends and local reputation. But courage and strength and endurance did not always win the returns for which men strive. There were many who played the game with fine courage and with the vigor and intelligence that ordinarily bring success, and yet missed the prizes. The arrow or the bullet of the Indian might bring a sudden ending to the career of the bravest and the strongest; and

*From the Trinchera.

†Beckwith's Report of Gunnison Expedition, page 40.

‡Report, page 60.

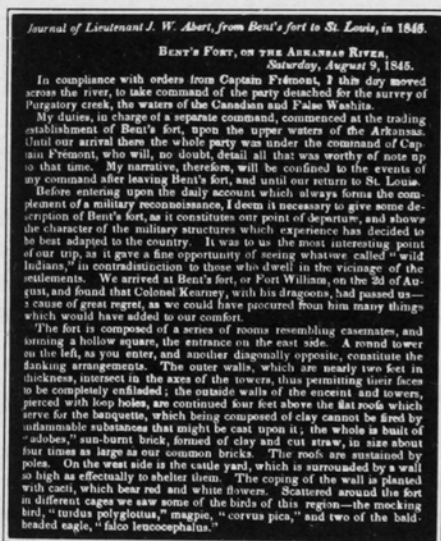
the shifting of a trail might make the promising location of a sagacious pioneer of little or no value. The early agricultural adventurer took the sportsman's risks and the gambler's chances. To win was his hope and purpose; to lose might be his fate, as he knew it had been the fate of better men; but to him, win or lose as he might, the adventure was worth the risk.

BENT'S OLD FORT.—In 1839 Thomas J. Farnham* arrived at Fort William on the Arkansas after many days of wearying travel. Here he was greatly pleased to receive the hearty welcome of a "fellow countryman in the heart of the wilderness." So glad was he at the prospect of a short respite from the dangers and privations of travel that the adobe walls of Bent's Old Fort seemed to him to be "noble battlements" that assured

protection and comfort. So they did, for a few days; and then the journey to the westward was renewed. Five miles beyond the home of William Bent and his brothers, Farnham came to a farming settlement where "a company of American and Mexican trappers" had retired "to spend the remainder of their days in raising grain, vegetables, horses, mules, etc., for the various trading establishments in these regions." It is probable that the Bents had tried farming at an earlier date than this. But here was a settlement with the agricultural motive, while Fort William (Bent's Old Fort) was established as a trading-post. In time the "noble battlements"

that had been laboriously built up to protect a famous trading venture were reduced to ruins; and in a shorter time practically all traces of the settlement called "Fort El Puebla" by Farnham disappeared. It was one of the settlements that vanished.

It may have been in the nature of events that Fort El Puebla had to disappear as an agricultural settlement. But our traveller suggested reasons that indicated the inevitable. Yet before that he noted the advantages



Description of Bent's Fort from the Journal of Lieutenant Abert.

*Travels on the Great Western Prairies. Thomas J. Farnham. London, Richard Dentley, 1843.

of the situation: the "Arkansas, some four or five miles above the post can be turned from its course over large tracts of rich land" from which the settlers "might realize the happiest results; for, as it is impossible, from the looseness of the soil and the scarcity of rain, to raise anything thereabout without irrigation; and, as this is the only spot, for a long distance up and down the Arkansas, where any considerable tracts of land can be watered, they could supply the market with these articles without any fear of competition.*" But the retired trappers were "wholly crippled by want of capital and a superabundance of whisky." However, Mr. Farnham added that the El Puebla farmers had a number of horses, mules, cattle, sheep, and goats, and still maintained "their original intention of irrigating and cultivating the land in the vicinity of their establishment." And this record was made under date of July 11, 1839.

WHAT SAGE SAW IN '42.—When Rufus Sage† traveled up the South Platte in the late summer of 1842, he observed a number of forts or trading establishments—among them Fort George and Fort Lancaster, the former belonging to Bent and St. Vrain, the latter the property of Lancaster P. Lupton. He made no mention of agriculture here, though a year later Fremont observed that Mr. Lupton's post "was beginning to assume the appearance of a comfortable farm," where hogs and cattle were ranging on the prairie and there "were different kinds of poultry." Mr. Lupton had planted a garden in which a considerable variety of vegetables had been in a "flourishing condition" until recent high water had damaged them.

At this point, on July 6th, the paths of Fremont and Sage crossed. The latter had mentioned that fifteen or twenty men were stationed at Fort George in 1842; also that a "large number of Mexicans" were employed at "the different trading posts" in the vicinity of Fort Lancaster. It seems fair, therefore, to assume that other efforts had been made to grow crops than the one mentioned by Fremont; for it is known that the Mexican laborers who were found useful in taking care of the stock and "doing the drudgery" connected with the trading-posts on the South Platte were from the agricultural settlements in New Mexico, and therefore familiar with farming methods, including irrigation.

LUPTON RAISED CROPS.—Lancaster P. Lupton seems to have been the first American to make a serious effort to raise stock and crops on the Platte in what is now Colorado. He established himself near the site of the present town of Fort Lupton in 1836 to engage in the fur trade. Our

*Farnham, page 107.

†Rocky Mountain Life; or Startling Scenes and Perilous Adventures in the Far West, During an Expedition of Three Years. By Rufus B. Sage. Boston, Wentworth & Company, 86 Washington Street, 1857.

present interest in him and his activities is due entirely to his efforts as farmer and stock-grower.

When Sage continued his journey from Fort Lancaster on September 10, 1842, he turned his horses' heads toward the west and south, intending to go to Taos, then one of the northerly settlements in New Mexico. He spent a night with a "camp of free traders and hunters on Cherry Creek," and then crossed the Divide. In July, 1843, Fremont visited the "pueblo" at the mouth of the Fountain, "where a number of mountaineers, who had married Spanish women in the valley of Taos, had collected together, and occupied themselves in farming, carrying on at the same time a desultory Indian trade." Fremont mentions the fact that these mountaineers had "a fine stock of cattle, and furnished us an abundance of milk." Sage, writing as of the latter part of September, 1842, states that "At the delta,* formed by the junction of the Fontaine qui Bouit with the Arkansas, a trading fort, called the Pueblo, was built during the summer of 1842." There were "ten or twelve Americans" at the place, most of whom were married to Mexican women.

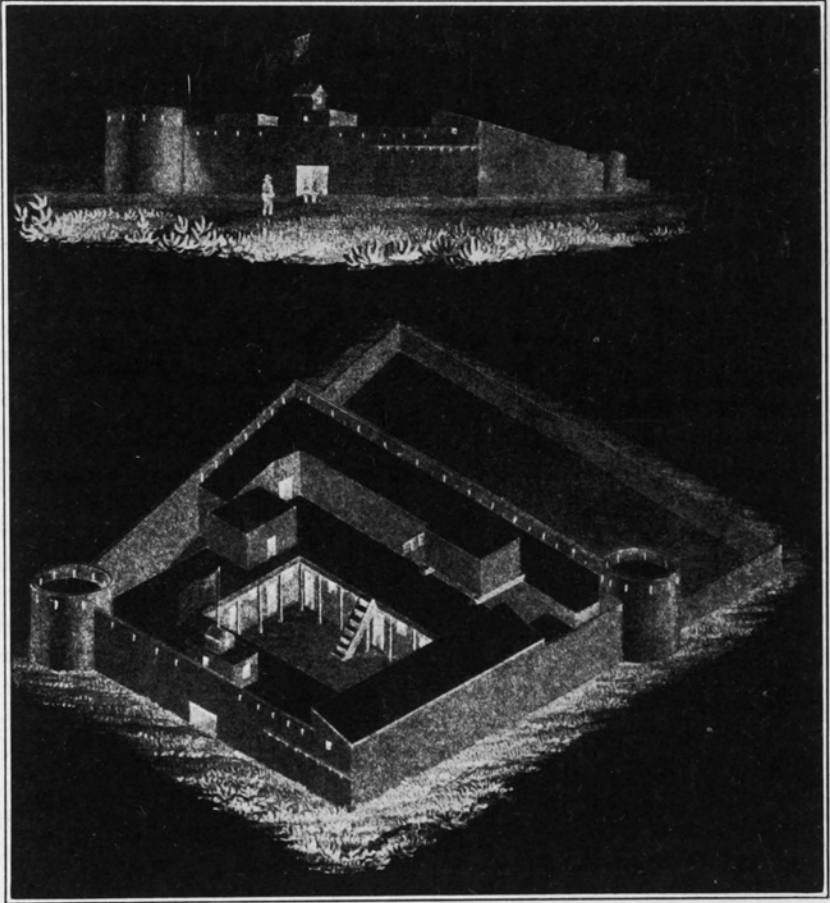
Nothing is said of their agriculture, as might be expected in the case of a settlement just being established. However, the Pueblo soon came to be well known as an agricultural community. Fremont visited it a second time on June 29, 1844, when he found a number of "old acquaintances" and the settlement in a thriving condition. In the same connection he mentioned that since his previous visit another settlement had been established on the river "some thirty miles above"—doubtless what was known as the Hardscrabble settlement. In September, 1847, Major Thomas Fitzpatrick, reporting as Indian Agent from Bent's Fort, mentioned a "small settlement" on the Arkansas, about seventy-five miles above the fort.

The settlers, he said, were "mostly Americans, Missouri French, Canadians, and Mexicans. They have a tolerable supply of cattle, horses, mules, etc., and I am informed that this year they have raised a good crop of wheat, corn, beans, pumpkins, and other vegetables."

RUXTON ON THE GREENHORN.—George Frederick Ruxton,† who came up from Mexico in the fall of 1846, was on the Greenhorn in the following January. Here he found two or three French Canadian hunters who had made that place their headquarters. "Game being abundant," remarks Ruxton, "and the rich soil of the valley affording them a sufficiency of Indian corn, they lead a tolerably easy life, and certainly a lazy one, with no cares whatever to annoy them." This observant traveler here added a remark which explains in part the tendency of the time to try to farm in the valleys near the Rocky Mountains:

*Sage, *Rocky Mountain Life*, page 222.

†Ruxton, *Life in the Far West*.



BENT'S FORT

The adobe forts of the exploration and trapper period were substantial structures, built to withstand siege and offering protection alike to settler and livestock endangered by Indian attack. Bent's Fort, here shown, as reproduced from the pages of the Journal of Lieutenant J. W. Abert, an aide of General Fremont, was typical. This drawing was made in 1845. It was around these adobe forts that crops were first grown by Americans on Colorado soil and cattle kept to provide milk and beef.

The depreciation in the value of beaver skins has thrown the great body of trappers out of employment, and there is a general tendency amongst the mountain men to settle in the fruitful valleys of the Rocky Mountains. Already the plough has turned up the soil within sight of Pike's Peak.

From the Greenhorn, Ruxton rode to the San Carlos, where he saw many spots "admirably adapted for cultivation, with a rich, loamy soil, and so situated as to be irrigated with great facility from the creek."

"Fourteen miles from the San Carlos," says Ruxton, "we struck the Arkansas at the little Indian trading-fort of the 'Pueblo', which is situated on the left bank, a few hundreds yards above the mouth of the Fontainequi-bouille. * * * Here I was hospitably entertained in the lodge of one John Hawkens, an ex-trapper and well-known mountaineer." In another paragraph he mentioned that "but little maize is cultivated." It was the summer of this very year that Major Fitzpatrick reported the "good crop" of wheat, corn, and other products.

The Pueblo continued to be occupied until 1854, although its population had decreased from the 150 mentioned by Fitzpatrick in 1847 to about two dozen in 1854; and then on Christmas Day (or the day before) a party of Ute Indians killed every man but one and carried off the one woman and two children. So vanished this settlement.

FIRST PERMANENT AGRICULTURAL SETTLEMENT

Bent's Fort was established as a trading station, although it is probable that stock were bred as well as kept there. St. Vrain's Fort was established for the same purpose, although we have record that pigs were kept there in 1843. Lupton's Fort Lancaster was a trading station, although Fremont noted that in July, 1843, the place had begun to "assume the appearance of a comfortable farm," with hogs, cattle and different kinds of poultry. The Pueblo at the mouth of the Fountain was primarily established as a trading station and place of rendezvous for hunters and trappers, although for a time it was a real agricultural community. The Greenhorn settlement seems to have been made with the agricultural motive and to have had its rude "Mexican" mill for the grinding of corn and wheat.

These and a few other places within the limits of the present State of Colorado, that need not be mentioned here, were real settlements at which some agricultural activities were carried on by Americans, Frenchmen, and Spaniards or Mexicans. Doubtless most of the trading posts were established with the idea that they were to be permanent. The facts stand, however, that they were fated to be temporary; their owners and the hangers-on who lived at or near them passed away; the "forts" were abandoned, and with their abandonment the pioneers of the second quarter

of the nineteenth century drifted elsewhere. Agriculture, however, was destined soon to get a permanent foothold within the limits of a region yet to become a great agricultural state.

SAN LUIS VALLEY SETTLEMENTS.—Reference has been made to the observations of Heap and Beckwith, who had visited settlements and seen irrigated crops* in the lower part of the San Luis Valley in the summer of 1853. Both Heap and Beckwith spoke of the Costilla settlement as being new, which would seem to imply that those on the Culebra were older. The evidence is conclusive that these settlements were never abandoned after this time—that is, July 4th and 5th, 1853, when Mr. Heap visited them; and August 15th, when they were seen by Lieutenant Beckwith.

When were the settlements made? On this point the testimony is conflicting. In the sketch of Costilla County in his *History of Colorado*,† Hall states that the “first actual colony was started” on the Costilla, in 1849; also that colonies “were established at San Luis, in the fall of 1851, * * * and in 1852 and 1853 settlements at San Pedro on the Trinchera and in San Acacio. Mr. A. A. Salazar‡ of San Luis, one of the earliest settlers, stated orally in August, 1924, and later in writing, that the settlement attempted in the fall of 1851 was broken up and the settlers driven out by the Ute Indians, or by fear of them. The next year the settlement was again made—this time to be permanent. It is to be remembered that Fort Massachusetts was built on the upper waters of Ute Creek during this year; so from this time forward the venturesome pioneers of the San Luis Valley were assured of military protection. From this time forward the settlement and development of the southern part of the San Luis Valley (in Colorado) was practically continuous.

THE ONLY SURVIVOR INTERVIEWED.—There have been claims that the settlement in Conejos County, at Guadalupe, was earlier than that on the eastern side of the valley; but these seem to be based chiefly on lack of information concerning actual dates. The only living member§ of the original group who came to Conejos County in August, 1854, stated very confidently in October, 1924, that there was no earlier settlement, giving

*“On its banks,” says Heap of the Costilla, “are numerous farms, which are skillfully irrigated, but in other respects are cultivated very carelessly by the Mexicans; however, their crops, consisting of wheat, corn, beans and peas, gave promise of better results than those on the Culebra. These settlements are new.”

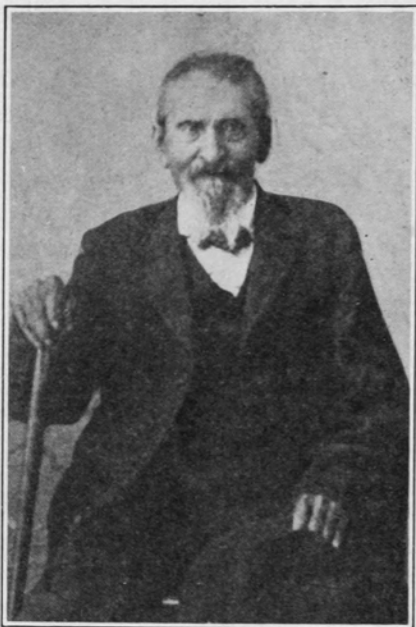
†Vol. III, page 329.

‡Mr. Salazar, as a boy of eleven, came to Colorado in 1859, and has lived at San Luis almost continuously since. He is a man of exceptional intelligence, considerable education, and good memory for facts.

§Vicente Velasquez, who was born at El Lanito, N. M., in March, 1838, and went with his uncle (Jose M. Jaques) with the party that explored the Conejos River region in August, 1854. The report of this party was so favorable that permanent settlement was decided on, and made in October. Mr. V. was married in 1863 and has five living sons. He and his wife raised a good crop in 1924 on their little farm on the Conejos west of Antonito, where they were visited on October 7, 1924, by D. W. W. Mr. V. began farming on this place in 1858.

detailed accounts of important happenings that strongly confirmed the accuracy of his statements.

The settlers who came to Guadalupe in October, 1854, under the leadership of Jose Maria Jaques brought with them horses, cows and oxen, sheep and goats. In the following March the Indians stole their stock, and they had to supply themselves again from older settlements south of the Colorado-New Mexico line. With their new supply of livestock, chickens were brought in for the first time. The first Mexican mill* was built on the Conejos River in 1856 by Mr. Jaques, and was run by water power. Previously the settlers had obtained their flour and corn meal from Taos, N. M., or from San Luis, where power grinding had been begun at an earlier date. However, from the time the first grain was grown in 1855, the Mexican women did grinding on metates with hand stones called *la manos*—a practice that was continued for some years after the power mill was in operation.



Jose Maria Jaques, leader of the party of New Mexicans who visited Guadalupe and vicinity in August, 1854, and later settled there—in October, 1854.—From a photograph lent by Meliton Velasquez, whose father is the only survivor of the original party.

FIRST AMERICAN MILL.—The earlier date of the last preceding paragraph is the earliest date when grain was ground at a permanent settlement in Colorado. According to Mr. Salazar, "Mexican" mills were used as early as 1853; and the first "American" mill was built "at San Luis in 1859" by H. E. Easterday, who was both millwright and miller. Two years before, Mr. Easterday had built an American mill at Santa Fe. At this time, it is to be remembered, San Luis was in New Mexico. A letter† from

*Written statement of Meliton Velasquez, son of Vicente Velasquez. Mr. M. Velasquez has taken special pains to secure trustworthy information from his father and others in regard to the pioneers and events connected with the settlement of Guadalupe and Conejos. He is positive that J. M. Jaques was the leader of the settlers who established themselves in Guadalupe in 1854; also that Lafayette Head came with the October party, but not with the group who came in August, 1854. In this he is supported by A. A. Salazar of San Luis, who seems to be the most dependable man in his county in regard to events within his memory.

†This letter is in the J. M. Francisco collection, from which I was permitted to make a number of photostat copies—one of the Easterday letter.—D. W. W.

Mr. Easterday to Colonel St. Vrain (of April 7th, 1860) is dated "San Luis, N. M., Mills." In a subsequent chapter this beginning of modern milling will be discussed more fully. The earliest settlers from New Mexico (Taos, Abiquiu, Santa Fe, and other places) well understood the need of being prepared to feed themselves; and practically all of them went to their new homes with some livestock and with seed for planting. These people were agricultural pioneers, not mere adventurers expecting to make their living by hunting, trapping, or trading; and they expected to raise their own food crops and to grind their own grain as soon as practicable. Until they could live on their own products they would send to Taos or Abiquiu, or even to Santa Fe, for the flour and corn meal to supply their pressing needs. There are abundant indications that they regarded mills as among the prime necessities. So a "Mexican" mill* was to be found in every Mexican settlement very soon after there was home-grown grain to be ground; and before the water-power mills were available, they used the hand mills, or metates.

CROPS OF THE MEXICANS.—The livestock of the early Mexican farmers consisted of cattle, sheep, goats, horses, mules, burros, hogs and chickens. Their first crops were wheat, corn, beans, peas, potatoes, lentils and chile. Oats and barley were brought in later†. Mr. Vicente Velasquez, a member of the original party that went to Guadalupe in August, 1854, stated on October 8, 1924, that the crops grown in 1855 included wheat, corn and peas, of which a scant crop was raised. Better results were had in 1856. The Guadalupe settlers brought with them to the Conejos in October, 1854, "horses, oxen, cows, sheep, goats, and chickens; hogs the next year." In March, 1855, according to Mr. V. Velasquez, the Indians took all of their stock, and they had to supply themselves with animals from the settlements to the southward. Mr. Jose Francisco Salazar of Ortiz,‡ who has lived continuously in the vicinity of Antonito and Conejos since 1863, remembers§ that the first crops were corn and wheat. The American settlers of later years were led to believe that corn was not adapted to Colorado because of the cold nights; but in the San Luis Valley, at elevations above 7,500 feet, where there is frost nearly every month, the Mex-

*Mr. Armand Choury of San Luis (son-in-law of A. St. Clair, who helped build the Easterday mill in 1859) writes of the first permanent settlers that, "Having raised a crop of grain, they had to construct 'Mexican mills.' Two of these were put up at San Pedro by Salome, Jaques and Francisco Vallejos, and one at San Luis by Mariano Pacheco." Mr. Choury came to the San Luis Valley in 1880.

†Statement of A. A. Salazar. In July, 1853, Mr. Heap noted that the crops on the Costilla, "consisting of wheat, corn, beans, and peas, gave promise of better results than those on the Culebra."

‡Ortiz lies just north of the Colorado-New Mexico line, and is on the San Antonito creek, about eight miles south of Conejos.

§Mr. Salazar was preparing his blue Mexican corn for the 1925 planting when visited October 7, 1924. No doubt this is the kind of corn grown there from the beginning. From a cottonwood branch he made a model of the kind of wooden plow used in the early days. He was 90 years old in 1924.

icans have been raising corn successfully for seventy years, and many of them still grow the variety introduced with the first settlers.

THE PIONEER FLOUR MILLS

Before there were any grist-mills equipped to make what was called American flour, a number of Mexican mills had been constructed by pioneers of the southern part of the San Luis Valley and probably on the Greenhorn, the Huerfano, and one or two other Colorado streams. These Mexican mills were simple in construction, but served to grind the corn and wheat of the pioneers into a reasonably acceptable meal. The burrs of these mills were made of the native stone of the region—a lava called malpais. These mill-stones were very hard and durable. Those used in the first mill* built near the old town of Guadalupe in 1856† or 1857 have been preserved as reminders of the simpler ways of the people who helped to conquer the wilderness before the Indians had given up their claim to the San Luis Valley.

The distinction between the Mexican and the American mills was the bolting cloths by which the fine flour was separated from the bran. Some of the later mills, which were provided with French burrstones, were not at first equipped with bolting-cloth. The mill built on the Cucharas in 1864 by J. M. Francisco and Henry Daigre, where the town of La Veta was afterwards established, did not bolt its flour, although the fine silk bolting-cloth purchased at the time was kept for more than sixty years‡ as evidence of the good intentions of the builders.

There have been many claims made in behalf of men said to have been the first Colorado millers. In an article descriptive of the Excelsior Flour Mill, the Denver Daily Tribune of September 25, 1867, gives the honor to Mr. John W. Smith in the following words:

Mr. Smith claims to be, and is, the pioneer mill man of Colorado Territory. In 1860 he ground the first wheat and corn in the territory with one small set of burrs and a five-horsepower engine. In 1862 he enlarged his mill and increased the power. In 1864 he changed to water power, and in 1865 he built the present mill.

FREMONT COUNTY MILL.—In Capt. B. F. Rockafellow's History of Fremont County in Baskin's History of the Arkansas Valley, Colorado, the statement is made that "the first grist-mill in Fremont County was built by Lewis Conley, in 1860, on his ranch * * * on Beaver Creek." This mill ground "about six bushels of wheat a day, and took one-fourth for toll." As wheat was then selling for from 10 to 12½ cents per pound,

*The upper stone from the first mill built on the Conejos near Guadalupe and Conejos is 31 inches in diameter and 6 inches in thickness.

†Mr. Meliton Velasquez, relying on the testimony of his father, a member of the original group of settlers, gives 1856 as the date of the building of the first mill near Guadalupe.

‡On October 8, 1924, Mrs. A. R. Francisco, a sister-in-law of J. M. Francisco, showed me the bolting-cloth bought for the mill in 1864.—D. W. W.

the miller had a chance to make money out of a small business. In the same book* occurs the following:

Early in 1862, the writer, satisfied with the permanency of settlement in the Arkansas Valley, secured the services of a company, who, crossing the plains from Illinois in that summer, commenced the erection of the first flour-mill ever built in the State of Colorado, at Pueblo. Although laboring under every disadvantage conceivable, a three-story mill was built, equipped, and in a week would have been doing custom work, when it was accidentally burned to the ground, parties owning it losing everything, even to clothing. The enterprise was reluctantly abandoned in consequence of the disaster, till 1865, when a Mr. Jewett built a mill at Pueblo that is still at work.

The apparent contradiction between this quotation and the statement above may be accounted for by supposing that the Conley grist-mill was not equipped with a bolting-chest, as the "flour-mill" doubtless was. Even so, it may be said now that the mill built in 1862 was not the first in Colorado; and neither was the Conley mill, even if we overlook the fact of its smallness and the practical certainty that it merely ground the grain into meal and had no means of separating the coarser materials from the fine flour.

FLOUR REACHES DENVER.—The Rocky Mountain News of December 1, 1859, contains two notices mentioning the receipt by Auraria merchants of supplies, including flour and corn meal. William Dunn had received several wagon loads from the Arkansas, his meal "ground at a new mill, recently erected by Wm. Kroenig, on Huerfano,† about one hundred and fifty miles from this city." Doyle & Co. had received an "immense stock" of new goods, including "30,000 pounds of flour, 15,000 pounds of corn meal, and 4,000 pounds of onions."

In the same issue of the News appeared an advertisement signed by J. B. Doyle & Co., dated "Auraria, Nov. 28, 1859," in which it was announced that the firm "have just received from their house at La Junta, New Mexico, a supply of superfine flour, Albuquerque onions, corn meal, oats, corn," and a miscellaneous lot of other merchandise. In 1861 Mr. Doyle‡ himself built a mill on the Huerfano at a place later known as Doyle's Mill.

The First Mill.—A fine flouring mill arrived yesterday for J. B. Doyle & Co. It will be shipped from here to the Huerfano, where it will be set up to grind the grain of the great farm of that firm, in the valley of that stream. Custom work will be done when the mill is not otherwise engaged.—Rocky Mountain News, September 6, 1861.

*Baskin's History of the Arkansas Valley, page 566.

†Mr. Kroenig settled on the Huerfano in 1858, and the following year, according to W. N. Byers, "from less than an acre of ground obtained and shipped to the Denver market over twenty wagonloads of vegetables."—See Rocky Mountain News of April 25, 1860.

‡Mr. Joseph B. Doyle came to Colorado from St. Louis in 1840, settling at Bent's Fort after two years "roaming round"; in 1846 going to Pueblo, where he remained about two years; thence to New Mexico, where he remained till 1854; thence back to Colorado, where he attempted to establish himself on the St. Charles; thence, because of impending Indian troubles, removing his family to Esconeville; again (about 1855) returning to New Mexico, where he remained until he made his final settlement in Colorado in 1859 on the Huerfano.—See sketch of A. P. Berry in the Encyclopedia of the New West, 1881.

One of the pioneer newspapers of Colorado was the Canon City Times, established at Canon City in September, 1860. In its issue for November 10, 1860, this paper contained an article entitled "Canon City: Its Rise and Progress," including the following:

The agricultural resources of the Arkansas River will be a new tributary of wealth to this place. Many farming claims are taken, and their return this year has encouraged the attention of the husbandman. Next season, unless the immigration is immense, the products will nearly equal half the demand. There are two grist mills in operation, one on the Huerfano, and the other on the Fontaine qui Bouille, their existence proving beyond doubt that this is a tillable country.

A note in Bancroft's History of Colorado (Works, Vol. XXV, page 392) states that "the first grist-mill in Fremont County was erected by Lewis Conley in 1860 on Beaver Creek, and was washed away in 1862." This statement agrees with that of Captain Rockafellow above quoted. It seems odd that The Canon City Times should not have mentioned this mill in its article of November 10, 1860, above quoted. It may be that the smallness of the Conley mill accounts for its omission from mention in the Times article.

FIRST MILL ON THE FONTAINE.—In the fall of 1924 Mr. John R. Cantril of Castle Rock stated to the writer that "the first flour mill in Colorado was at Old Town, below where Manitou now stands—a water mill on the Fountain," adding that he had "hauled wheat from Captain Craig's ranch on the Huerfano to this mill about 1864 or '65." Another of the pioneer mills was mentioned in an article contributed from Boulder to the Georgetown Mining Review of May, 1874, by E. H. N. Patterson, who wrote under the nom de plume of "Sniktau."

In this connection it may also be stated that the first flouring mill in the county was started by Doughty & Son, on South Boulder, in 1862, the proprietors having made the burrs from conglomerate rock found in the foothills.

"The first mill in Colorado was built at San Luis in 1859. From this mill flour was sent to Denver, Golden, California Gulch and Canon City. There were small Mexican mills built in 1853. Before that (in 1852) grain was taken to Taos for grinding." So said A. A. Salazar* of San Luis on August 18, 1924. The filing for the water power ditch was made in 1859. The mill was built by Mr. H. E. Easterday, who employed a Pennsylvania millwright† to set up the machinery.

EASTERDAY'S FIRST ADVERTISEMENT.—In the Rocky Mountain News of April 25, 1860, appeared what seems to have been Mr. Easterday's first newspaper advertisement offering for sale flour from the new mill. The announcement follows:

*In a letter dated September 19, 1924, Mr. Salazar said, "As to the first mill, will say that * * * the first flour was ground in 1859 according to my personal knowledge." As a boy of eleven, Mr. Salazar was at San Luis in 1859, and so had opportunity to know the fact he reports.—D. W. W.

†This millwright was Alexander St. Clair, whose daughter Mary married Armand Choury. Mr. Choury is sure that the Easterday mill was the first to turn out "regular flour."—Letter September 1, 1924.

FLOUR!

FLOUR!

Mr. Byers, Dear Sir: We wish to give notice through your valuable paper, that we will keep constantly on hand a large and beautiful supply of American Mill Flour, made at our mill in New Mexico, at Canon City, near Tarryall, and in a very short time we will erect a good building at Independence City, a new and beautiful place just secured and laid out at old Pueblo crossing on the Arkansas River, by my esteemed friend, Dr. Wm. M. Belt & Co., from Independence, Mo., from which place we can supply Colorado and the miners in the mining districts.

April 24, 1860

H. E. EASTERDY & Co.

In the Weekly Bulletin and Supplement to the News of May 23d two changes appeared in the "notice"—Hamilton City* being substituted for Canon City, and the signature being changed to Strain & Easterdy. A week later this was corrected to read St. Vrain & Easterdy.† (Mr. Easterday's name was consistently misspelled.) An item in the Rocky Mountain News of June 30, 1860, mentioned the rapid growth of Hamilton City, near Tarryall, illustrating the statement by mentioning a wholesale provision house just erected by St. Vrain & Easterday. Doubtless this was the place where they kept the supply of American mill flour from San Luis on the Culebra.

DOUGHTY'S BOULDER MILL.—Mention has already been made of the Excelsior Mill and its owner's claim that he was the pioneer mill man of Colorado; but there seems to be no direct evidence that he made "American" or bolted flour before 1864. In the Georgetown Mining Review of May, 1874, Mr. E. H. N. Patterson,‡ writing from Boulder, mentioned incidentally that "the first flouring mill in the county was started by Doughty & Son, on South Boulder, in 1862, the proprietors having made the burrs from conglomerate rock found in the foothills." An article in the Rocky Mountain News of July 7, 1864, refers to this mill as follows:

The saw and grist mill of Messrs. Doughty & Son, a few miles above the furnace, and near the canon, which proved such a convenience to the farmers of the surrounding valleys last season, was swept away by the flood, but the burrs and most of the machinery were saved, and the mill will be immediately rebuilt on an enlarged and improved plan. The Messrs. Doughty assured us that they will have it ready for business in time for the incoming crop.

That this pioneer flouring mill§ of Boulder County was ready to grind

*"This young city laid out on the nearest suitable ground to the Tarry-all mines, is growing beyond all precedent. It already has one wholesale provision store—that of St. Vrain & Easterday, advertised elsewhere," etc.—News, June 30, 1860.

†H. E. Easterdy, Esq., of Culebra favored us with a call Tuesday. He is on his way to Hamilton, where he is largely interested.—Canon City Times, July 4, 1861.

‡Mr. Patterson had been at Boulder in 1859 and also in 1861. He was a close and accurate observer.—D. W. W.

§Andrew Doughty, a Pennsylvanian, erected the first grist mill in this county, which was the first completed in Colorado. It was set on the South Boulder in 1861. The same season, but a little later, the second grist mill in the county * * * was put on the St. Vrain, near Pella, by a Mr. Davis and partner. The burrs for both the Doughty and Davis mills were cut by the hands of their respective owners from the rock of the adjacent hills. Mr. Doughty also established the first flour mill near the town of Boulder, at Red Rock. This was in 1866. The next year he removed to St. Louis, Larimer County, establishing the first flouring mills there * * *.—A. Bixby, in History of Boulder County, 1880.

the incoming crop according to the owners' promise appears from an editorial article in the News of October 21, 1864, as follows:

It is not necessary to wait for extra fine flour to come from St. Louis to this market, any longer, since they are manufacturing in this territory some of the finest flour which we have seen in any section of the States. Messrs. A. Doughty, at their excellent mill on South Boulder, turn out some of the fairest, sweetest flour that any one need ask for. From samples of it received at this office, through the politeness of those liberal millers above mentioned, we are able to tell Denverites and Colorado generally, where to get their cereals ground in the best style of the art, and where to get a sack of flour of superior quality—to the South Boulder Mills.

FLOUR FROM BEAR CREEK.—While the above quotation might seem to imply that the News editor did not know that Colorado wheat flour was available from other sources than the Doughty mill on the South Boulder, it is only necessary to turn to the file of the News for September 19, 1864, to find that Colorado wheat was being converted into choice flour within a dozen miles of Denver. The testimony, under the heading "Colorado Flour" runs as follows:

Before us lies a sample of Colorado flour, made from Colorado wheat in a Colorado mill, which looks like—and we are assured is as good flour as ever was offered on the Denver market. It was made at Barnes' mill* on Bear Creek, eleven miles from this city, and of new wheat. The first load of this flour was brought to market today and is for sale by the sack at the store of J. J. Cobb, on F Street below Blake. He has secured the sole agency and will keep a constant supply on hand. When we have tried it in bread we may have more to say of its merits.

But this is not the earliest newspaper testimony concerning Colorado flour. Reference had been made to a grist mill on the Fontaine qui Bouille, said to have been in operation in 1860. This mill was, probably, located at or near Colorado City, then a considerable town for the Pike's Peak country. The Denver Weekly Commonwealth and Republican of August 20, 1863, testifies as follows:

Our thanks are due the firm of Colton & Co.,† of Colorado City, for 59 pounds of flour, manufactured from new wheat at their mill in that place. It is a superior article. Colton & Co. are prepared to manufacture from one to one hundred sacks per day. They warrant all their work. They will undoubtedly get the custom of the whole southern country, as there is no other mill in that section nearer than Fred Maxwell's beyond the Raton Mountains.

This statement does not necessarily imply that the mill at San Luis was not in operation, or at least in condition to operate after the later harvest of the San Luis Valley, for the main road to New Mexico led across the Raton Pass, and there was comparatively little travel from Denver into the San Luis Valley and on to Taos and other New Mexico points.

Colorado City became an important milling center a few years later than the date of the foregoing reference to the Colton mill. A correspondent of the Denver Tribune, writing from Colorado City under date October 28,

*A sketch of Fred H. Buckman, in "Denver and Vicinity" (1880), says that "the old Barnes' mill * * * was started April 18, 1864, being the first mill built on Bear Creek."—The Rocky Mountain News of Sept. 16, 1864, reported it in operation.

†An article from Colorado City in the Rocky Mountain News of Nov. 6, 1862, refers to a new mill just raised by E. T. Colton.

1867, stated that he "would not advise the building of any more grist mills at this place. They have only three already completed and more in prospective, all near together—up in the very canon of the mountains." This writer declared that the three mills, "if properly distributed, would grind all the grain raised in the lower country for years to come." In the following spring Mr. W. R. Thomas, who was then making a study of the agriculture of the territory for the Rocky Mountain News, wrote from Colorado City on May 26, as follows:

The fine water power afforded by the Fontaine is being improved, and three flouring mills have been erected. That of Messrs. McPherson and Kenneth is a new one, and is known as the "Champion Mill." It was constructed last fall at a cost of \$18,000 and has already gained a most favorable reputation among the citizens south of the divide. It has a capacity of about fifty bushels per hour, and will doubtless become justly famous for producing first-class flour.

ON THE CUCCHARAS.—Reference has been made to a mill built on the Cucharas by J. M. Francisco and Henry Daigre. This was a water power mill which is of particular interest as having been built as a part of the farming establishment of its owners. The Rocky Mountain News of July 14, 1868, spoke of this as "the largest and most celebrated farm" in the Cucharas Valley, and referred to the mill as a part of the equipment of the farm. This mill began grinding about the middle of September, 1864. A few years later the mill was enlarged or rebuilt. On November 24, 1865, Mr. Daigre wrote* from "Las Cucharas" to Mr. Francisco expressing the opinion that it would be to their advantage to have the mill put in condition to make good flour. The home of Francisco and Daigre was within the present limits of the town of La Veta, and the old buildings still stand on what is known as "The Plaza"—the most interesting spot in the town.

In May, 1865, a member of the News staff visited Boulder, and in his paper of the 27th he reported that "A large flouring mill has been built this spring about four miles below Boulder, near the Butte. It only awaits the machinery—now on the plains—to begin work." This mill was built by P. M. Housel, and was afterwards known as the Butte mill and Housel's mill. In 1872 or '73 it was bought by Henry A. Drumm, an experienced miller, who had been employed in several different Colorado mills erected at earlier dates. In August of the same year an article in the News reported two new mills† in Jefferson County.

*A postscript, as follows: "I hope you will not dispose of your French burrs before coming. I think it would be to our advantage to have our mill fixed here to make good flour, which can be done with little expense."—Apparently Mr. Francisco was at Denver.

†We noticed, while on a visit to Golden City recently, two new flouring mills up in that town; one of them is ready to run, and the other will be by the time the new crop is ready for grinding. Each of these mills has two run of burrs. We saw a specimen of the flour made by the Barnes' Mill, and believe it is superior to the best St. Louis flour. This mill was last year located upon Bear Creek and has been removed to Golden City this summer. Mr. Barbour has the foundation laid for another mill, with four run of burrs, and is now on the road with his stones and machinery. These mills are all to be run by water power.—Rocky Mountain News, Aug. 19, 1865.

San Luis N. M. Hills Apr 8th 1860

Enclosed please find memorandum
of goods required for our store at
this place. Which I have endeavored to
make plain but having no S. I. S. I.
bills to go by I expect I have used
in names and description of some thing
in which case you will please act
on your own judgement for amount
& spiritual consent. We have changed
the name of our town and sent on
to the Postmaster general a petition
asking him to grant us a Post office
calling it San Luis. By filling the
memorandum and having packed
and marked S. I. S. I. San Luis. N. M.
and forwarded to this place you
will confer a favor. I expect to start
for the mines the 10th with three wagons
and have them on the keurpans and
go ahead. Mr. Francisco's wagon will not
start till about the 16th or 18th of this
month

Colonel the going and coming
and those necessarily ~~needed~~ involved
with our business at this place makes
the house work to much for the
Custody and the impossibility of
getting house help has induced us to
~~let you~~ ^{let you} the favor to buy us a good
strong negro woman that can do all
kinds of house work and bring or
send her with the wagons by doing
so you will confer a favor in us long

to be by us remembered and for which
we will try to make ~~provision~~
We have no news of import to write
but will write often we will be glad
to hear from you as often as convenient

Yours truly
H. C. Custody

The illustration on the previous page is a photostatic copy of a letter from San Luis, New Mexico (now in Costilla County, Colorado), written by H. E. Easterday of Easterday and St. Vrain, millers and freighters, to his partner, Colonel Ceran St. Vrain, in April, 1860. Theirs was the first American mill to start making bolted flour on Colorado soil.

The letter is interesting, not only for its minor details on business affairs, but also because it directs Colonel St. Vrain, who was then at Denver, to purchase a negro woman to do the housework for the Easterday family. This commission for the purchase of a slave was never carried out. Colorado became a territory in 1861 and it was free soil from the start. The original of this letter is in the Francisco collection at La Veta, Colorado, in possession of John B. Hamilton, who loaned the letter to D. W. Working. The wording is as follows:

San Luis, N. M., Mills,
April 7, 1860.

Inclosed please find memorandum of goods required for our store at this place. Which I have endeavored to make plain but having no St. Louis bills to go by, I expect to have erred in names and description of some things, in which case you will please act on your own judgment for convenience by mutual consent. We have changed the name of our town and sent on to the Postmaster General a petition asking him to grant us a postoffice, calling it San Luis. By filling the memorandum and having packed and marked S. & D., San Luis, New Mexico, and forwarded to this place, you will confer a favor. I expect to start for the mines the 10th with three wagons and leave them on the Huerfano and go ahead. Mr. Francisco's wagons will not start till about the 16th or 18th of this month.

Colonel, the going and coming and those necessarily around connected with our business at this place makes the house work too much for Mrs. Easterday and the impossibility of getting house help has induced us to ask you to do us the favor to buy us a good strong negro woman that can do all kinds of house work, and bring or send her with the wagons. By doing so you will confer a favor on us, long to be by us remembered and for which we will try to make remuneration. We have no news of import to write, but will write often. We will be glad to hear from you as often as convenient.

Yours truly,

H. E. EASTERDAY.

GETTING A Foothold ON THE LAND

When the pioneers of 1858 and 1859 began to think of the possibilities of farming on the upper reaches of the South Platte River, they found themselves face to face with the puzzling question, how to secure a foothold on the land. The Indians were understood to have a more or less valid title, which it was assumed would be extinguished when Congress should get around to the task of enacting the necessary legislation. Meanwhile, the mines were attracting their thousands of gold-hunters, and the valleys of the Platte and its upper tributaries were appealing to hundreds who believed that there might be as much gold for them in the crops that could

be raised to feed the men and animals in the growing towns and mining camps. But how should they secure defensible titles to farming lands and the improvements they needed to make upon them?

The region south of the Arkansas had belonged to Mexico; and there much of the choice land was held under the lavish grants made by generous Governor Armijo of New Mexico in 1843 and other times prior to the acquisition of the lands ceded by Mexico after the war of 1846. It was a simple matter to get some sort of a title to land on the Huerfano, the Las Animas, and other southern streams, although troubles enough came later regarding these Mexican titles. North of the Arkansas the problem was less simple. However, the situation was met by staking out land claims and giving notice to the public, as the following will serve to illustrate:

I. H. Cochran claims 160 a of land Bounded and described as follows Commencing at a stake on the west Bank of the Platte river about 5 miles above Plumb creek running thence West 160 rods to a stake thence north 160 rods to a stake thence East to the Platte river thence up the river to place of beginning

Said clame mad this 15th Jul 1859 in presence of Wm Bambrick

On the back of the sheet appears a rough map of the Cochran claim and four others, all fronting on the Platte River. This claim was filed for record on July 15th, 1859, at 6 o'clock a. m., and it is endorsed as having been recorded in "Book of Claims, p. 67." An earlier claim is on record as follows:

I, the undersigned on or about the twelfth day of May A D 1859, took a claim of one hundred & sixty acres more or less Situated about Eleven or twelve miles from here on cherry creek had a Correl built a garden planted & and the claim formerly belonged to the Express company having been abandoned by them I have taken it for my Sole use and benefit Signed Sealed delivered in presence of R E Whitsett

Wm T Carlyle Seal

This claim was also recorded in the Book of Claims, on page 66, having been filed for record on the 28th of August, 1859.

COMPLIED WITH THE CODE.—As may be assumed, this was the customary method of acquiring land for farming purposes. The code was complied with in each case. The claimant made public his claim to a definitely described tract, and paid the required fee for recording, as is shown on the back of the Cochran claim. What was the "code" just mentioned?

In the Rocky Mountain News of August 13, 1859, may be read the following report of a meeting held five days earlier in the town of Auraria:

At a meeting of the Arapahoe County Claim Club held in Auraria, Aug. 8th, 1859, the following resolutions were unanimously adopted:

RESOLVED, That each and every claim holder, who holds claim for farming purposes, shall make, or cause to be made, improvements on his or their claim, by breaking one acre of land; or building a house sufficiently good to live in. The same shall be made within sixty days from the date of this resolution.

RESOLVED, That all claims, with the above improvements, shall be considered valid for one year from the time the improvements are made.

CHARLES L. DAHLER, Secretary.

Two weeks after the publication of the foregoing, there appeared in the same paper the following report of the organization of a claim club in El Paso County*:

A meeting of the citizens of El Paso County was held on the 15th inst., in Colorado City, for the purpose of organizing a "Claim Club," for the protection of the rights of squatters on public lands; the jurisdiction of said club to be co-extensive with the boundary of El Paso County. Judge Wagoner was elected chairman, and W. P. McClure, secretary. After the adoption of a liberal constitution, a permanent organization was effected by the election of M. S. Beach, President; Lewis N. Tappan, Secretary and Recorder; H. M. Fosdick, Justice of the Peace; and D. Pursall, Constable. Seven Directors were elected, two of them being the President and Recorder; the others are Messrs. Fosdick, Wagoner, Pursall, McClure, and Clark.

On motion, it was voted that the minutes be published in the Rocky Mountain News.
LEWIS N. TAPPAN, Secretary.

ARAPAHOE CLAIM CLUB.—The News of January 18, 1860, contained an official notice calling a meeting of the Arapahoe County Claim Club, to be held on February 8th, to elect a new board of officers and to take under consideration important proposed amendments to the constitution of the club; and a local item emphasized the need of a large attendance. The meeting was held on the advertised date, and A. C. Hunt was chosen temporary president. After the purpose of gathering had been stated a committee of five was appointed "to revise and amend the present constitution and by-laws of the club," and to report at an adjourned meeting on the 11th, when the election of officers was to be held. As reported in the News of the 15th, the members again assembled according to agreement. The adjourned session is particularly interesting because of the speed and unanimity of the proceedings.

A large assemblage of the members of the Arapahoe County Claim Club convened at Cibola Hall, Auraria, pursuant to adjournment, on Saturday, February 11th at 2 o'clock p. m.

The meeting was organized by calling N. G. Wyatt to the Chair, and appointing W. D. Dawson, Secretary.

The minutes of the previous meeting were read, and, on motion, adopted.

"The next business in order being the report of the revising committee appointed at the last meeting," that committee, by its chairman, proceeded to read a constitution of seventeen articles, introduced by the following preamble:

WHEREAS, It sometimes becomes necessary for persons to associate themselves together for certain purposes, such as the protection of life and property; and as we have left the peaceful shade of civilization—left home and friends for the purpose

*It may be noted here that Kansas Territory extended to the summit of the Continental Divide until the organization of Colorado Territory in February, 1861. In 1855 Arapahoe County was created by the Kansas Legislature—"Beginning at the northeast corner of New Mexico; running thence north to the south line of Nebraska; thence west along said line to the east line of Utah territory; thence south along the line between Utah and Kansas territories to the north line of New Mexico; thence east along the line between New Mexico and the territory of Kansas to the place of beginning."—Subsequently five counties were created out of the portion of Arapahoe County west of the 104th meridian of longitude—Montana, Oro, El Paso, Fremont, and Broderick. Montana County included the towns of Auraria, Denver, and Montana. The Denver papers do not seem to have recognized the change; but Colorado City was prompt to acknowledge that it was in El Paso County—where it remained.

of bettering our condition, we, therefore, associate ourselves together under the name of "The Arapahoe County Claim Club," and adopt the following constitution.

When the reading was finished, "on motion of Wm. Clancy, the report was received and adopted in full, without amendment or alteration." Proceeding according to the provisions of their new constitution, the members promptly and unanimously elected A. C. Hunt president. Thos. E. Pim and George Wyncoop were nominated for vice-president and secretary and recorder, and were elected "without opposition." Then a committee of five was appointed to nominate six directors; and upon consultation the committee reported six names, and their report was unanimously adopted. A blank in the constitution was filled by voting that the regular meetings of the managers of the club should be held on the "first Saturday of each month." It was finally resolved that the editor of the Rocky Mountain News be "earnestly" requested to publish the proceedings in full in the next issue of his paper. There being no further business, on motion the club adjourned.

OTHER CLAIM CLUBS.—Many other claim clubs were organized. On March 18, 1860, the "Farmers Claim Association" of the Keystone District was formed at the house of Jesse Estlack near the mouth of Plum Creek, "pursuant to notice." G. B. Jones was called to the chair, and W. M. Bambrick was appointed secretary. After the adoption of a "Preamble, Agreement, and Constitution," Mr. Estlack was unanimously elected president; and Mr. Jones and John A. Koontz were chosen vice-president and secretary and recorder. As a last act before adjournment, it was "unanimously agreed" that the proceedings be published in the Rocky Mountain News. And so we have the record of what seems to be a unique Preamble and Agreement, as follows:

WHEREAS, It has been found necessary in all new countries for settlers upon public lands to associate themselves together for self protection: Therefore, in defense of our property and families, we do solemnly enact the following articles of agreement:

ARTICLE I. We, whose names are hereto subscribed, claimants upon public lands, do hereby agree with each other and bind ourselves upon our honors that we will protect every just and lawful claimant in the peaceable possession of his or her claim, and that in case of said claim being jumped we will, when called upon by the proper officer, turn out and proceed to enact all decisions which may have been duly made.

ART. II. We further agree that when the surveys have been made and the land offered for sale by the United States, that we will attend said sales EN MASS and protect each other in entering our respective claims.

ART. III. We do further agree that after the sales are made and lands secured, to deed and re-deed to each other, so that each claimant may secure his or her claim as held at the time of such sale.

CLAIM CLUB CONSTITUTION.—Another club worthy of mention was formed on November 6, 1860, with a constitution brief enough and comprehensive enough to be given here in full as an illustration of the general character of the organizations of claim-holders. The report of this organization meeting was published in the News of November 30th. The settlers

met at Hunter's Ranch, and organized by electing John Jones chairman and J. F. Gardner secretary. They then adopted a constitution in the form of a series of resolutions, as follows:

RESOLVED 1. This District shall be called the Cherry Creek District, and the boundaries shall be as follows, viz: The west line shall be the main divide between Cherry and Plum Creeks. The east line shall be the main divide between Cherry and Running Creeks. The north line shall be the north line of Mr. Moore's farm, and the south line, the south line of Mr. Leptrap's claim.

RESOLVED, 2. A claimant shall within five days after taking his or her claim, have it recorded, and shall drive a stake, or set a post upon the place where he intends to build, and shall also give the boundaries of his claim, and within fifty days from the time of recording, he shall erect a comfortable dwelling, or make other improvements to the value of fifty dollars, and every succeeding three months, he shall improve said claim to the amount of twenty-five dollars.

RESOLVED, 3. Any person of the age of fifteen years may hold a claim by complying with the laws of this district.

RESOLVED, 4. All persons holding claims before the organization of this district shall have them recorded within thirty days from the time the proceedings of this meeting are published, and within thirty days after recording, he shall make such improvements as are required in the second resolution.

RESOLVED, 5. Any person may take a claim in any shape he pleases, provided that if it be neither a perfect or oblong square; the smaller shall join the larger portion by a line of not less than eighty rods.

RESOLVED, 6. Any person by improving his claim to the amount of one hundred dollars may absent himself therefrom six months, and still his title hold good.

RESOLVED, 7. A majority of the citizens of this district are competent to settle all disputes that may arise therein, on the first Monday of the month.

RESOLVED, 8. There shall be a meeting of the citizens of this district held quarterly, on the first Monday of the month.

RESOLVED, 9. The proceedings of this meeting shall be published in the Rocky Mountain News.

The foregoing "constitution" having been adopted, provision was made for the future activities of the district by electing C. E. Parkhurst president, L. Herrington vice-president and J. E. Gardner secretary. As published, the report of the proceedings of the meeting were signed by John Jones as chairman and J. E. Gardner as secretary.

CONSOLIDATION IS URGED.—As the number of claim clubs increased, it became evident that there was a growing tendency toward diversity of laws and methods of administration. It became evident, too, that there might easily develop such differences as would tend to defeat the hopes of all claimants whose chief desire was to secure a title from the United States Government as soon as the necessary legislation could be enacted and surveys be made. So it was but natural that there should soon develop a contrary tendency toward consolidation. If local organizations were the best to represent the neighborhood interests of settlers, a more general organization could hardly fail to be more effective as the representative agency of groups of settlers in their broader relations. This idea found expression in the Rocky Mountain News of June 7, 1861, in an editorial article under the heading "Farmer's Claim Clubs"—an article which adds

something of historical interest to the argument for the kind of unity which assures power with the agencies of government.

A plan for the consolidation and uniform government of all the claim clubs in Arapahoe County was recently introduced and discussed by the club of this city and vicinity, which has always been known and is organized under the name of the "Arapahoe County Claim Club." In the early days of the settlement of the country, it was the only one here, and extended over the whole county; but recently its territory has been divided by the settlers in the several portions of the county into various districts, with independent codes of laws and convenient local boundaries. While the parent club has no desire to re-establish its jurisdiction over the entire county, yet it desires the mutual adoption of general laws, and an arrangement of conflicting boundaries that will secure uniformity of action, and an union of strength. To attain that object it is proposed to call a convention, at an early day, in which each club shall be represented by two delegates, to consider the following desirable objects:

- 1st. A perfect harmony of laws in the different clubs.
- 2d. The boundaries of the jurisdiction of each.
- 3d. The regulation of appeals to a board of arbitration.
- 4th. The basis of an arrangement between claim holders as to the settlement of boundary lines of claims in reference to future surveys of the United States.

The importance of each of these objects will readily suggest themselves to every one who is in the least interested in the agricultural resources and enterprises of the country. The board of arbitrators may consist of the presidents of the several clubs, and a certain number may constitute a quorum for the transaction of business or the settlement of conflicts between neighboring districts. The fourth proposition, however, is the most important, and imperatively demands the early consideration of every land claimant in the territory.

Those who have before settled in the West, and experienced all the disadvantages and vexations incident to a squatter's life on the public domain, will see the importance of a unity of action and strength in guarding and protecting the future homestead rights of the actual settler; but people from the East, who are serving their apprenticeship in the far West, will hardly realize the true state of the case until they have seen titles perfected in this country. We hope that the object proposed will meet with a hearty response from every claimant.

Evidently the plan for consolidation attracted general attention throughout the territory; for when the Arapahoe County delegates met in convention on the second day of November, 1861, they found representatives present from clubs of other counties; and so the News was able to report in its issue of November 4th "a convention of delegates representing the agricultural interests of Colorado" which took the initiatory steps toward forming a territorial organization. Mr. Byers was prompt in proposing that Congress be memorialized to provide for the "final establishment of the original lines of the claims" by a special act similar to the Oregon Land Act. He also read a prepared memorial, which was referred to a committee of three with instructions to "propose some plan of action to this meeting." With Mr. Byers as chairman, the committee soon reported a "memorial and petition to the Congress of the United States," which was adopted.

CONGRESS IS MEMORIALIZED.—The memorial represented that it was "important for the benefit and advancement of the agricultural interests of Colorado Territory" that Congress should at an early date enact a special law to regulate the entry by pre-emption of lands occupied by actual settlers prior to the survey of such lands. It stated that, "owing to the peculiar

conformation of the face of the country and the almost total want of rain during a great part of the year—particularly in the growing season—the lands at present available for agricultural purposes are confined to the narrowest belts or valleys bordering the streams; and even upon these a system of artificial irrigation is absolutely necessary to secure any certainty in the production of all kinds of farm and garden produce. This necessity has caused all the early settlers to make their claims to correspond with the natural configuration of the country, usually fronting on a stream, and running back at right angles thereto a sufficient distance to include the squatter claim of one hundred and sixty acres.”

Thus (the memorial continued) each considerable water-course in the agricultural portion of the Territory—or the Plains—has fronting upon it, a double row of farm-claims, and that water front is absolutely necessary to enable the farmer to render his land productive. The lines of the government surveys will necessarily intersect these mutually agreed upon and established “claim lines at all conceivable angles; frequently including the dwellings, garden or other improvements of neighbors, upon the same subdivision—cutting off the water privileges, ditches, dams, water-wheels, or other necessary and valuable improvements, of one settler, and include them in the pre-emption right of another.

Other evils were foreseen; and Congress was petitioned to enact a law for the relief of settlers upon the public lands, so that each settler might have 160 acres “according to his claim lines.” So insistent were the memorialists on having their original claim lines respected that the memorial proposed that the claimant should pay the additional cost of surveying which would be made necessary.

After the adoption of the memorial, it was voted that the central committee be instructed to have copies printed and sent to local committees in all parts of the territory, in order that signatures might be secured and the petitions returned to the central committee to be forwarded to the territorial delegate in Congress. This central committee, as finally completed, consisted of Wm. N. Byers, S. W. Brown, J. Kershaw, Dr. J. H. Morrison, A. C. Hunt and Wm. H. Middaugh.

TO ENCOURAGE FARMING.—An interesting side-light on the mixed motives of members of the convention is thrown by an editorial article in the issue of the News that contained the report of the convention. Arguing for activity in circulating and signing the petitions, which were to be issued “in a few days,” the News declared that each signature would “aid in securing a boon which will do much toward placing our young territory upon a footing independent of surrounding territories and states; and put cheap bread in the mouths of all.” On November 16th the editor returned to the subject in an article entitled “Claimants’ Petition,” in which it was said: “It is not to the interest of the farmers alone that the relief asked should be granted; but to everyone who expects to reside in the territory, let his occupation be what it may. The tendency will be to encourage

and give confidence to farmers. They will not hesitate to make extensive and valuable improvements, if they can have the assurance that their claims and improvements will not be taken from them. The result will be to extend the business, and thereby cheapen bread and every other necessary and luxury of life that can be produced here."

The memorial so ardently championed by Editor Byers was introduced in the Legislative Assembly, then in session. It promptly passed the Council; but, according to the News, it struck the House "as being a superfluous piece of legislation," and was indefinitely postponed. However the House was not unfriendly to the claimants on public lands. In more than one act the Assembly recognized the validity of the "claims" of the settlers on the unsurveyed public domain.

In an act approved November 1, 1861, this same first Assembly of the Territory of Colorado formally recognized the right of a claim holder to maintain trespass, ejectment, and other actions for the protection of his possessory rights "extending to the boundaries of his 'claim'." It was provided in the law that the claim should not exceed 160 acres in extent; that the boundaries should be so marked as to be easily traced; and that the claim should be improved and occupied, with at least five acres enclosed by a reasonable fence. Another act of this Assembly declared that "persons who claim, own or hold a possessory right or title" to land within the boundary of Colorado Territory on the bank or margin of a stream "shall be entitled to the use of the water of said stream," for the purpose of irrigation. Thus it was made clear that the rights recognized by the several claim clubs were also recognized by the Legislative Assembly. Congress, however, was comparatively slow to act in the interest of the adventurous squatters on western lands. The Homestead Act of 1862, although it was not to be to the liking of many of the members of claim clubs, was to mark the beginning of a great epoch in the settlement of Colorado and other territories and states of the West.

CHAPTER II

Rural Life of the Pioneer Period

With what facility and speed the pioneer farmers of the Pike's Peak gold region set about the business of food production may be judged from the series of incidents and events related here. What was done in the development of irrigation, the agitation of sugar beet growing that led eventually to the establishment of that industry, and the exciting era of cattle and sheep raising, are treated in separate chapters. Here the record is of the daily life of rural Colorado from 1859 to statehood in 1876 and beyond, to the end of the pioneer period.

The manner of taking up or staking out claims has already been described. The crop years of 1859, 1860 and '61 had put the new community well along the road of experience. What occurred in farming during the first two seasons in the Platte Valley is told mainly in the chapter on irrigation. A glimpse of southern Colorado, where isolated ranches were under cultivation prior to the gold discoveries, shows sudden activity, especially in the settlements on the Huerfano where the demand for food for the Pike's Peak "diggings" was immediately felt and responded to.

PORK FROM THE HUERFANO.—"Fresh pork from the Huerfano" reached Denver December 21, 1859, to hearten the first Christmas of the pioneer gold seekers, the merchant who offered it for sale being William Dunn. He also advertised "a large supply of cornmeal, corn, potatoes, onions, cabbage, turnips," and, in fact, all kinds of winter vegetables. The farmer who supplied this store of provisions was William Kroenig, 135 miles south of Denver.

During the following June a correspondent of the Rocky Mountain News visited the Huerfano settlement and interviewed Kroenig, who gave him information regarding his own and other ranches. Kroenig had 160 acres in cultivation, Charley Autabee had 120 acres, J. B. Doyle 30 acres, Young 40 acres, and Patterson 40 acres, all on the Huerfano. On the Fontaine-qui-Bouille, Jenks had a farm of 70 acres and Anderson 40 acres. Near Fontaine City there was another 40-acre farm. On the Greenhorn about 100 acres were in cultivation and 20 acres more on the Arkansas, making a total, according to Kroenig's calculation, of over 600 acres of cultivated land, against about 125 acres in 1859. In addition to the farms above enumerated, there were a great many gardens and small fields. Crops seemed to be doing well that year, as the farmers were all dependent upon

irrigation. "We may feel assured of a good supply of vegetables and not a small amount of grain, potatoes, etc., for winter supply," said this correspondent.

In another letter it was related that a great portion of the territory south of the Arkansas was held under grants from the Mexican government, the principal owners of which were Kit Carson, Ceran St. Vrain, Judge Spruce, N. Baird, Robert P. Kelley, Luis N. Baca, and Judge J. Houghton. These grants were being subdivided and offered for sale in 1860.

DOYLE CAME IN 1840.—Among the early settlers on the Huerfano none was better known than Joseph B. Doyle, who came to that section from St. Louis, in 1840, and who, according to his biographer, Judge A. P. Berry of Pueblo*, found others in the region south of the Arkansas, then a part of the province of New Mexico. In 1859 Doyle took up land on the Huerfano, where the Doyle ranch became famous during pioneer years. He built a flouring mill on his ranch and opened stores at Pueblo, Denver, Colorado City and Canon City to supply the newly-arrived settlers with necessities.

Doyle died in 1864. Of him the Rocky Mountain News of March 16, 1864, said: "Mr. Doyle was one of the first who commenced agricultural pursuits in southern Colorado, and he has ever labored with zeal worthy of emulation, to make Colorado second to no other agricultural state in the Union."

DAIRY FARMER ON HUERFANO.—W. M. Pierson, who milked a hundred cows and made butter and cheese to supply the wholesale markets of Denver and the mining camps, was probably the first dairy farmer on the Huerfano. In 1861 he was preparing also to establish a dairy farm in California Gulch, to supply*the miners in that new camp with milk and butter.

In another year changes were noted in a descriptive letter published in the Canon Times of March 23, 1861: "Pueblo was dull but the farm claimants are making active preparations for putting in extensive crops. On the Huerfano the same improvements are going on. Among the new ranches may be noticed that of A. Majors, stretching out with its extensive buildings like some lordly domain. Between Pueblo and the reservation line are 125 ranches, half of which will be worked this season. These, added to the other farms on and near the Arkansas, will give a harvest the value of which may be estimated at upwards of a million dollars."

*From sketch of Judge A. P. Berry in the Encyclopedia of the New West (1881).

While this estimate undoubtedly was much overdrawn, farming activity was remarkable, considering the brief period that had elapsed since the rush began.

FARMING ON THE ARKANSAS.—A detailed description of farming in the Arkansas Valley, written by B. T. Allen at Canon City, October 23, 1862, gives a fair picture of conditions at that early day. Allen, in writing to the Rocky Mountain News, says:

I will give you as a plain farmer my ideas of this locality in particular, as a farming or grazing country, derived from three years of experience in this valley of the Arkansas River. * * * All kinds of grain or vegetables grown in Illinois will grow here. The inquiry is or may be, what is your average yield to the acre of the different crops? I will answer only from my own experience: Wheat, 35 to 40 bushels per acre; Mexican corn, 30 to 40 bushels; American corn, 40 to 50 bushels; potatoes, 100 to 400 bushels; barley, 40 to 50 bushels; sorghum, 200 or 250 gallons of syrup per acre.

The tobacco plant, as well as the sweet potato, thrived well and come to maturity here. The reader will, of course, take into consideration that we have to irrigate all lands cultivated in order to be sure of crop. The following are at present out prices here by the pound: Corn, three cents, wheat, four; barley, six; potatoes, three; beans, five; onions, six; and canned molasses, \$1.50 per gallon. As to the cost of irrigation, it depends on the quantity of water you have, and the convenience of it to the ground; but it has cost me, after once getting the water onto the land in ditches, about \$4 per acre to the season; labor costing \$1.50 a day. Stock for the two winters past has fattened on grass, unless worked, and very seldom need to be fed at all.

Of the various kinds of wild fruit abundant here is the plum, growing four inches in circumference, and of a better quality than I ever saw in the states, also raspberries, currants, cherries and grapes from which we manufacture a good article of wine.

The length of time between frosts for the last three seasons was as follows: 1860, five months and eighteen days; 1861, five months and twenty-seven days; 1862, five months and sixteen days. Snow fell in the winter of 1860 and 1861 to the depth of seven inches, duration five days; in 1861 and '62 it fell to the depth of nineteen inches, duration 11 days. To the man wishing to engage in agriculture, we have plenty of land left. To the mechanic we have water power in abundance and want mills. To the invalid we have the healthiest, most pleasant and best climate in the world in Colorado territory.

PLATTE VALLEY IN 1861.—What the Platte Valley looked like in the fall of the third season was described by a correspondent under the heading "A Ride in the Country" in Rocky Mountain Weekly News, of October 23, 1861: "Down the river on the east or south side the first farm that attracts particular attention is that of Dr. Morrison, three miles from the city. Here is a fine, substantial farm house, extensive, well-fenced and well-farmed fields, and a vast congregation of grain and hay stacks forcibly reminding one of scenes in the States. We have been told that the yield of the Doctor's farm this year reached the snug sum of \$12,000, but cannot vouch for the truth of the report. Passing a number of claims * * * we come to the fine farm of Mr. Reithman and next beyond that of E. McLaughlin, Esq. Both are well fenced with posts and boards and give unmistakable evidence of thrift. The Hermitage of our old friend, J. J. Minter, six miles from the city, became our halting place. * * * Next below is the farm of Mr. Farwell. * * * Crossing the river, we next come upon

the ranch of Mr. Kerr * * * At the mouth of Clear Creek is the well-improved place of Mr. Ford * * * following up Clear Creek * * * We halted at the fine residence of Jerry Kershaw * * * They have a fine farm of over 300 acres nearly all fenced and prepared for irrigation."

FIRST THRASHING MACHINE.—Thrashing machines were already in use, the first one having been brought to the Platte Valley by M. C. Fisher in the fall of 1861. An advertisement in a Denver newspaper called attention to the fact that "on and after the 20th day of October" Fisher would be prepared to thrash and clean all kinds of small grain. The machine arrived at Denver after an overland trip from the Missouri River, November 1, 1861, and it attracted general attention. Others followed in 1862, among them being a machine for J. McAuley, who gave out the first thrashing returns on which an accurate estimate could be based for wheat yields. This report appeared in the Rocky Mountain News of January 19, 1864. It covers the grain crop of 1863, as follows: "From Mr. McAuley, who has been engaged in thrashing ever since last harvest and has doubtless better means of knowing than any other man in Colorado, we learn that the small grain crop of the Platte watershed the past year was about 50,000 bushels. Of this total about 33,000 bushels was wheat, equivalent to 13,200 sacks of flour, provided all of it was ground. A large share of this amount, however, must be counted out; a part for seed, and a very considerable quantity for feed for stock. The remaining 17,000 bushels is mainly barley and oats, with a little rye and buckwheat. The Arkansas country, including the Fontaine-qui-Bouille and Huerfano valleys, probably produced an equal quantity, giving a grand total of 100,000 bushels of wheat, barley and oats as the crop of 1863. Considering the newness of the country, its small farming population, and the very unfavorable season, the result is quite satisfactory. This year will doubtless see it doubled, as the season bids fair to be favorable, and our farmers have gained much valuable experience."

In Boulder County Wellman brothers were among the first farmers, beginning operations in 1860 two miles east of Boulder. They raised potatoes and a small patch of wheat. Among others starting about that time was Perry White, on the St. Vrain, who grew a crop of wheat in 1860. By 1862 there was an ample supply of wheat to keep the mill of Doughty & Son on South Boulder Creek busy.

GOVERNOR EVANS ON FARMING.—Governor John Evans in his message to the Territorial Legislature July 18, 1862, called attention to the rapid development of agriculture in these words: "As to a home supply of agricultural products so important to the accumulation of permanent wealth and population, the crops now standing on the farms in the valleys of

the various branches of the South Platte and Fontaine-qui-Bouille afford most encouraging prospect. In the latter valley alone there will be produced this year, according to careful estimates, 25,000 bushels of wheat, 40,000 bushels of corn, 20,000 bushels of potatoes, and other produce in proportion. The great profits of such crops and the exceeding productiveness of those lands lying along the streams, I have no doubt, will induce an agricultural production that will abundantly supply the land."

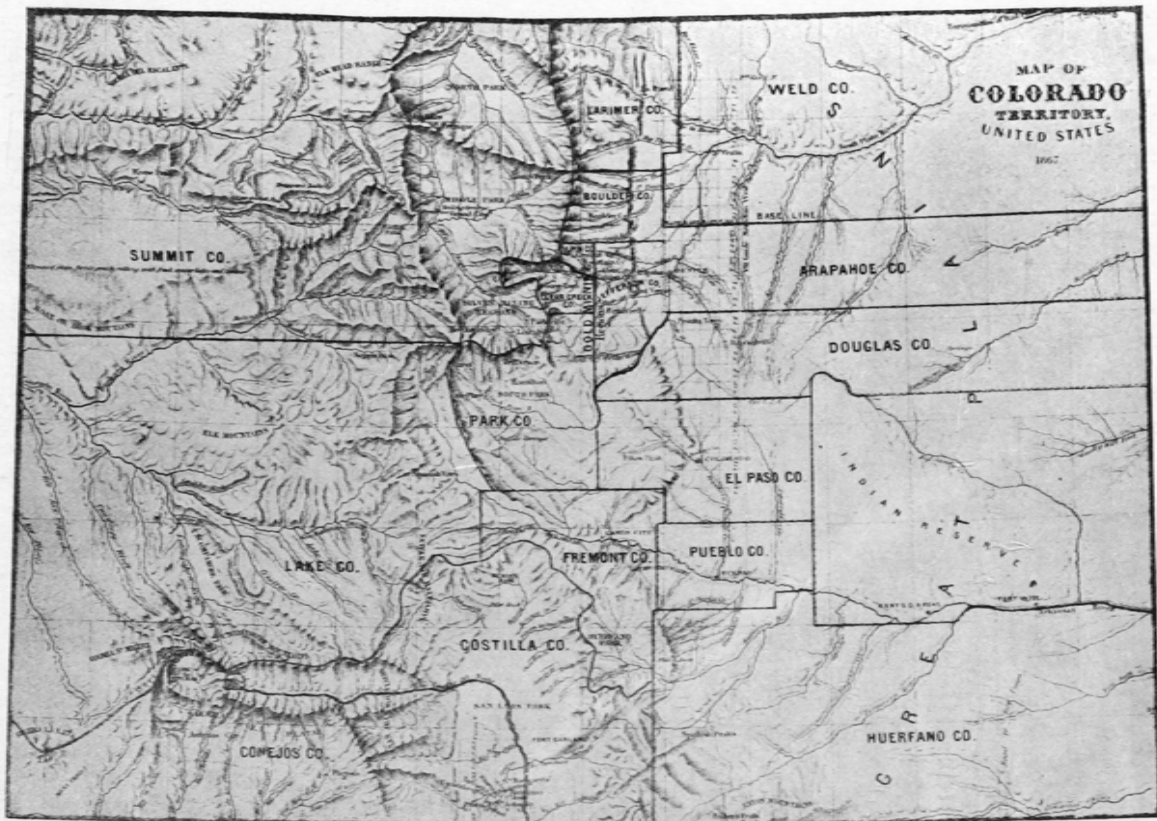
It did not take the farmers long to influence the cost of living in the Pike's Peak region. The winter of 1861 was described as affording a striking contrast to that of 1860. "A year ago flour was worth \$16 to \$18 per hundred pounds; now it can be bought for \$10 for first quality and \$9 for second grade," said a newspaper account of January, 1861.

HIGH PRICES FOR PRODUCE.—J. Max Clark, one of the Union Colony pioneers, in an interview with Albert B. Sanford, curator of the State Historical Society, in September, 1926, gave some interesting information concerning prices paid for produce in the mining camps. Clark first came to Colorado in 1860, when he was 19 years of age. He came overland from Wisconsin in May of that year, bringing a full load of onions, potatoes and flour. He put up at the Elephant Corral in Denver and found prices for produce exceedingly high. He was on the point of selling out to Denver buyers when a prospector advised him to drive up to Gregory Gulch with his produce. He did so and sold his load as fast as he could pass it out. He realized just double the prices that were offered in Denver, the onions selling at 50 cents a pound, potatoes 35 cents a pound and flour \$28 per hundred pounds.

After the first enthusiasm over the prolific yields of irrigated farms and gardens had subsided, the pioneers began to take stock of their agricultural resources and to seek a way of turning the industry to commercial advantage. The urge for that came from the scarcity and high price of necessities. It was fortunate that men of influence were farm-minded and that they saw in agriculture the permanence that this industry ever assumes where men congregate, no matter what may be the first impulse to cause settlement.

FIRST EDITORIALS ON AGRICULTURE

Significant of this trend toward agriculture was the fact that the Rocky Mountain News and its short-lived competitor, the Cherry Creek Pioneer, appearing simultaneously on the twenty-third day of April, 1859, carried as leading editorials a call, not to the mines, but to the farms. The Pioneer did not appear again, its proprietor, John L. Merrick, selling out immediately to William N. Byers, publisher of the Rocky Mountain News. That



*Map of Colorado Territory, 1867, Reproduced from "Colorado in the United States of America,"
 by J. P. Whitney of Boston, Massachusetts.*

publication continued agitation of the subject and assumed leadership in the development of the farming industry, rather more so than in mining. The mining industry received much more attention in print, but mostly in the way of reports of gold strikes—that is, strictly as news. Agriculture, however, was frequently the subject of editorial comment in which its vital importance to the new community was emphasized, and people were urged to give it more attention.

There is no record that Byers went gold hunting but he did go to farming, staking out a claim of 160 acres in pioneer fashion before the United States homestead act had become a law, which event occurred in 1862. The two agricultural editorials above mentioned serve as historic introductions of farming in the public press and they are herewith reproduced:

FARMING VS. GOLD DIGGING.—“Farming vs. Gold Digging” was the title of the editorial in Volume 1, No. 1, of the Rocky Mountain News. It follows:

From present appearances our citizens are likely to all be taken off with the Cherry Creek yellow fever inasmuch that the farming interest of our territory if likely to suffer materially and miners will also have to suffer for want of supplies. This is all wrong; and our opinion is that farmers who stay at home, and spend as much money to improve and cultivate their farms, will realize more clear profit by so doing than they will to go to the mines.

There will be enough to go to dig all the gold all the Union will need and those who raise stock and produce for the mines will get their equal share of the gold in exchange for their produce. Everything must be high and will bring cash next fall; and those who live at home will be perhaps best off. Many mechanics will leave for the mines and those who remain will be much the best off in two years from now, as on the frontier along the Missouri the immigration is going to settle up the country very fast and wages will be very high.

Those who wish to get real estate will never be able to purchase it as cheap nor on as good terms again, as the gold mines have turned the heads of all those who have bought property in the territory, and all they think of is to dig gold and wash gold. It is our candid opinion that those who have a few dollars to spare will make more by buying property in eastern Nebraska at present, while the excitement is so high, than they will to go to the mines.

OUR AGRICULTURAL PROSPECTS.—The Cherry Creek Pioneer discussed the subject under the caption “Our Agricultural Prospects,” as follows:

* * * Irrigation doubtless will be necessary in some places but it will be some time before such a thing will be necessary, as there is sufficient bottom land to accommodate all who follow agricultural pursuits for some time to come, and the upper prairies will be used for stock ranges. Captains Theodore and William Parkinson are opening a farm in the bottom below town and are well satisfied with the soil. Above town on the opposite side of the river, a large farm is being opened, vegetable gardens are being opened on Long Creek, Clear Creek, and other places, and in no instance where we have conversed with those engaged in these enterprises, are any doubts felt or fears entertained as to a successful result. * * * On the Divide the Indians have been raising corn for years; in fact, our candid opinion is that if this country has only a fair trial, it will prove better than the most sanguine had anticipated.

BYERS LIVED ON A FARM.—With William N. Byers, editor of the leading newspaper, engaged in farming and living on a farm, and the terri-

torial governor equally as enthusiastic on the subject of agriculture, it is not surprising that the industry was kept constantly before the people. Byers' farm was located on the Platte "two miles from Denver."* It consisted of 160 acres, 50 or 60 of which were under cultivation in September, 1862, when the place was described in detail by a fellow publisher, Alfred Thomson, editor of the *Miner's Register* at Central City. From this description the following is quoted: "Here are melons of every variety, vegetables of all kinds—potatoes, tomatoes, cabbages, onions, egg plants, beets, peas, beans and everything that grows in this country. His corn will yield at least 60 bushels to the acre. Should the News office fail to yield a sufficient income there is no danger that Byers will suffer for the want of the good things of life; for we presume he will realize \$2,000 or \$3,000 per annum from this ranch, besides supplying his own table. The farm is managed by Mr. Dailey, a brother of the News foreman."

Thomson describes other nearby places, among them mentioning the farm of Governor Evans "on Cherry Creek two miles away," which now, like the Byers homestead, is part and parcel of the City of Denver. Thomson declared that probably less than half of the flour used during the winter of 1861 would supply the demand of Denver and the nearby mining camps, because of the great quantity of potatoes from the crop of 1862. By that time, too, Colorado mills were grinding Colorado flour, from Colorado-grown wheat.

The time seemed to have come for an organized development and the question was, how shall that be started?

AGRICULTURAL SOCIETY PROPOSED.—Already in 1861 a group of men prominent in the community had called a meeting for July 31 for discussion of the question of forming an agricultural society. While nothing came of this at the time, it is nevertheless of interest to scan the names of the thirty-two pioneers who signed the call for that meeting. Oddly enough, a majority were not farmers but business and professional men, indicating that there was general recognition of the need for organized development of agriculture. Here is the list:

Thos. Gibson
Edward Palmer, M.D.
P. E. Peers
Jim Pim
J. M. Broadwell
W. H. Keller
J. H. Morrison
Lewis N. Tappan
Robt. Kizer
Allyn Weston
Edward Bliss

A. H. Miles
Moorley Clinton
Will H. Guthrie
A. Allen Packer
C. Keith
J. F. Hamilton
Amos Steck
N. D. Town
William Gilpin
H. M. Vaile
A. G. Boone

*The Byers homestead was located in what is now the Valverde section of Denver.

Lafayette Head
 J. Wanless
 Fred Z. Salomon
 Alex Majors
 A. G. Reed

Henry Yost
 A. O. Patterson
 E. S. Wilhite
 Wm. Larimer, Jr.
 A. B. Miller

That list is a roster of the men who built the territory; men who made the political as well as the industrial history of Colorado. They recognized that agriculture was paramount; that without farming gold and silver meant nothing.

STUBBS GETS ACTION.—The man who raised the question of organized agricultural development a second time and whose call resulted in action, was Robert Stubbs. He was interested in livestock rather than crop growing, but nevertheless had an idea and presented it in a way that brought community action. In a public statement under date of August 13, 1862, Stubbs ventured a prediction that came true within a decade and he called for the organization of an agricultural society that was effected in a few months. His statement headed "Agriculture in Colorado" was in part as follows:

The people of no mining country in the world can prosper where they pay such fabulous prices for bread, as has been done here. Let us for one moment take a glance at the agricultural capacities of our Territory. It is well known that no State in the Union will compare with Colorado Territory for grazing facilities, without it be western Texas and California, and it is a matter of extreme doubt whether these two states come up with it in excellence * * * Before leaving this part of the subject, I wish to make a prediction: * * * Before ten years Colorado beef will grace the stalls of the butchers in the New York markets, and the spindles of Lawrence will run on Colorado wool. * * * It would cost less than one dollar a head to drive one thousand head of cattle from here to the Missouri River, * * *

As the products of the soil, it is well known that everything can be raised here that can be produced in the Northwestern States, and that in sufficient quantity to abundantly supply home consumption. How to develop these capacities is a subject that should claim the attention of every one who feels an interest in the growth and prosperity of our flourishing young territory. Perhaps through the medium of the press would be one of the best means of arriving at that desirable object. The papers of the Territory would doubtless open their columns for the practical herdsmen and farmers to give their experience in their respective avocations, and offer such suggestions as might present themselves. The formation of agricultural societies, and the holding of agricultural fairs, would doubtless be very beneficial to the best interests of the Territory. Such has been the case in New York, in Ohio, in Illinois and wherever else such societies have been in existence. Would it not be well to get up a fair to be holden in Denver in the latter part of September? Such a fair would give a good opportunity for the formation of an agricultural society, and of enlisting an interest in the subject.

AGRICULTURAL SOCIETY FORMED.—On March 14, 1863, a meeting was held in Denver of which A. H. Miles was chairman, W. T. Muir and William N. Byers serving as secretaries. The two last named and Thomas Gibson, another editor, were appointed a committee to draft a constitution and by-laws for the Colorado Agricultural Society. Two weeks later the organization was perfected, officers being elected as follows: R. Sopris, president; Robert Stubbs, vice-president; W. N. Byers, secretary; Simon

Cort, treasurer. Executive committee: J. J. Minter, J. M. Johnson, David Ripley, T. P. Boyd, and John M. Veasey.

Mr. Minter moved that the society hold a fair the coming fall. Governor Evans was among those who urged the passage of this motion. A committee was appointed and instructed to make preparations for a fair, but none was held that year and, indeed, not until 1866. However, organization was proceeded with and the constitution and by-laws framed and adopted at a subsequent meeting, March 28, 1863. Article I provided: This association shall be called the Colorado Agricultural Society.

“Article II.—Its object shall be to promote the interests of stock raising and husbandry in all its branches, and every means and measure which will conduce to the benefit of its members.

“Article III.—Any person feeling an interest in the objects of this association and a desire for its success, may become a member for the current year by signing this constitution and paying the sum of two dollars, or by paying the sum of ten dollars, he shall become a member for life.”

Then followed other provisions in the usual parliamentary form, outlining the duties of officers and of the executive committee. The principal object of the society was apparent from the provision relating to the duties of the president, namely, he shall “superintend the preparation of fairs or exhibitions.”



Plaza de Guadalupe, Conejos, Colorado, the home of Lafayette Head, territorial Lieutenant Governor and organizer of one of the earliest Spanish settlements in the San Luis Valley.

PURPOSES ARE OUTLINED.—Publication of the full proceedings of the organization meetings in the Rocky Mountain News was supplemented by an editorial outlining more fully the plans and purposes of the society.

“We look upon this as one of the most important steps ever taken by our people,” quoting from the editorial, “and hope that the interest hitherto manifested since the enterprise was proposed will not be allowed to flag. Every man who is interested in the advancement of Colorado should become a member and contribute his mite to the success of the society. Henceforth at the meetings of the association—which will be once a month or oftener—some subject of interest to the members will be discussed for general information. At the next meeting the question proposed is that of irrigation, which is unquestionably the most vital and important that can present itself to the farmers of the territory. To further the objects of the society, and benefit the farming interests generally so far as we are able, we shall hereafter devote some space in the News to the subject of agriculture and respectfully solicit contributions to that department. There are many farmers well qualified to write, who have had two and three years’ experience in this country, and we hope to hear often from them, as well as from new beginners. We shall also make such selections as we can that will be beneficial here from eastern agricultural journals. It is earnestly hoped that every farmer, from the Cache la Poudre to the Arkansas, who possibly can, will attend the next meeting and become members of the society.”

While the purpose was, ostensibly, the improvement of agriculture, the society did not draw much farmer support, and it became merely an organization for the backing of the territorial fair.

NO MONEY FOR A FAIR.—It seemed impossible to raise enough money in 1863 to hold a fair. The following year the society was reorganized and chartered by the territorial legislature, which voted an appropriation of \$500 for the purpose of paying premiums. An annual meeting of the society was called for March 5, 1864, for the purpose of closing the business of the old association. Subsequently the new association was called together and the charter granted by the legislature formally accepted. The bill providing for this charter was fathered by Representative Amos Widner of Boulder County. No part of the appropriation could be used for salaries, or in fact for any purpose except premiums. Summer and fall again passed without a fair, consequently the legislative appropriation remained unused. The Civil War was in progress, the Indian menace was ever present, grasshoppers had invaded the territory, the first feverish rush for precious metal had come to a halt, and conditions were, to say the least, unsettled. Money was too scarce to risk it on such an educational enterprise as an agricul-

tural fair, which would bring no cash returns, hence 1864 passed without an exhibition.

The call for the annual meeting of 1865 was issued March 28, and it bore the signature of Richard Sopris, president. It urged all interested in farming to attend, but especially that the fifty members of the society gather at the Planters House in Denver at the appointed time. The meeting was held and Sopris was re-elected president, Amos Widner of Boulder vice-president, J. H. Eames treasurer, and D. H. Chever secretary. Directors: F. A. Squeirs, H. M. Teller, Milo Lee, A. Z. Sheldon, N. W. Welton, Robert Stubbs, A. B. Sopris, William N. Byers, J. H. Estabrook. A motion was adopted to take immediate action "for holding of an agricultural fair this fall."

FIRST TERRITORIAL FAIR, 1866

Again there was failure, but in 1866 the first fair was held. There was also a race meeting, for racing was legitimately a part of agricultural fairs in those days, because the horse was supreme not only as a draft animal on the farm, but for riding and driving. Improvement of breeding had been carried further with the horse than with any other farm animal, and development of blood lines for speed and endurance in harness, or under the saddle, found in the sport of racing a logical means of competition. That this sport afterwards became the principal incentive for many fairs was not true of the West alone but was a manifestation of a common human tendency to respond to the sporting instinct rather than follow a serious purpose, such as breed improvement.

An exhibit of minerals was usually a part of the first fairs, but it was later dropped out because the mining industry saw no necessity for thus displaying its wares and, of course, in minerals there was a lack of the competitive element which is so notably evident in a showing of agricultural products.

Open gambling was a regular feature of the early day fairs except in the Union Colony at Greeley, where all games of chance were barred and horse racing also was taboo.

WAS CALLED A SUCCESS.—The first territorial fair held in September, 1866, under the auspices of the Colorado Agricultural Society, was pronounced a success by the newspapers, as will be seen from comment quoted herewith:

"The size and quantity of our vegetables are wonderful to recent arrivals in Colorado. Turnips as big as pumpkins and weighing over fifteen pounds, are in the collection, together with beets that beat all creation. The finest display of eatables of this class that we noted came

from Clear Creek County, being raised near Georgetown, thirty-five miles from the valley and near the foot of the snowy range. Of potatoes we noted very fine lots from various quarters. One blue Neshannock (the exhibitor's name we did not learn) weighing two pounds and three quarters. Corn raised on the highlands eleven feet in height and ripe enough already to defy the attack of grasshoppers is there."*

There followed a description of entries of vegetables and other crops, to the extent of a column, with a list of exhibitors, including Greenleaf Page, William N. Byers, Dr. Parsons, Ferrand, Samuel Morgan, Everett, McDonell, T. J. Buchanan, Simon Cort, Stickers, Thomas Hartman and Thomas N. Sloan. Special mention was given the exhibit of L. K. Perrin and sons as follows:

PERRINS' FINE DISPLAY.—"L. K. Perrin and sons have the finest display of farm and garden fruits at the fair. Arranged in a tasty manner on the stand assigned to them are thirty-three varieties of choice farm and garden vegetables, including Lawton blackberries, fine grapes, raspberry canes, and strawberry plants of the choicest kinds. In this lot, which must be seen to be appreciated, we noticed one summer squash 44 inches in circumference. Mr. Perrin's contributions to the fair alone will demonstrate that Colorado cannot be excelled in her agricultural products by any country in the world."

Perrin was a pioneer experimenter, one of the first farmers to grow sugar beets, the pioneer strawberry grower, the first to grow and sell broom-corn, one season's crop bringing him \$600 from a Denver broom factory.

An effort was made in 1867 to put the territorial fair on a paying basis and wipe out a deficit from the previous year. The net receipts in 1867 were \$3,500, which enabled the association to pay off an indebtedness of \$1,000 from the previous year. There were nearly three hundred entries in the agricultural, livestock, mineral and household classes in 1867. The fair was expanded that year to include all agricultural sections of the territory, and while no subsidy was received from the legislature, it seems that gate receipts covered expenditures.

FIRST RACE MEETING.—In that year we find the first record of a regular race meeting which was held Saturday, May 18, the entries being as follows: J. M. Broadwell's "Snowbird," W. R. Ford's "Colorado," C. G. Baldwin's "Ghost." Mile heats were trotted, best three in five to harness, for a purse by the society of \$50, with an inside purse of \$250 each.

The big event of the fair, however, was a race against time for a prize of \$50 for the horse coming nearest the three-minute record which was then the fast mile for the American trotting horse. The event was open

*Rocky Mountain Weekly News, September 26, 1866.

to trotters and pacers, and it is of interest to know that there were ten entries, with "Belle of Denver" clipping two seconds from the record, her time being 2:58. "Belle" was owned by William R. Ford. Cane Baldwin's "Tip" was second in 3:06. This was on the second race, these two having trotted a dead heat in the first mile in 3:01½.

BONDS TO COVER INDEBTEDNESS.—Financial success was not achieved by the fair association without effort. Bonds were issued to cover indebtedness incurred in establishment of the fair, and much urging was necessary in disposing of these evidences of indebtedness to public-spirited individuals.

A full report was made by Richard Sopris to the president of the territorial legislature in November, 1866, regarding the financial condition of the Agricultural Society and its fair. This report indicated an indebtedness of \$8,765, to be covered by the bond issue. A 40-acre tract of land had been purchased in east Denver which was inclosed by a grout wall eight feet high. There was a circular pavilion built of wood 100 feet in diameter for the exhibition of agricultural products, implements, works of art, and miscellaneous articles. Stables had been built accommodating 110 horses, and there were yards for cattle, sheep and swine, as well as pens for poultry. An irrigation ditch ran through the grounds. There was a half-mile track with suitable stand for the judges. In fact, the fair grounds were the equal in size and accommodations provided for similar expositions in the States.

STATEMENT TO LEGISLATURE.—Of interest to agriculture was the statement made by President Sopris to the legislature as follows: "Judging from the agricultural products placed upon exhibition (1866) we are of the opinion that uplands on the plains produce equally as good and heavier crops of grain than the low bottom lands. Also, that as fine garden vegetables can be grown in the mountains, almost to the very foot of the snowy range, as upon the plains."

A change was made in officers in 1867, except that Richard Sopris was re-elected president, others chosen being D. H. Nichols of Boulder County, vice-president; George W. McClure, Arapahoe County, treasurer; W. D. Anthony, Arapahoe County, secretary. Executive committee: C. H. McLaughlin, J. H. Estabrook, and L. K. Perrin. By resolution the chairman of the board of county commissioners of each of the organized counties of the territory was made a director of the society representing his respective county.

SOUTHERN COLORADO ORGANIZES.—Southern Colorado, noting the success of the annual fair at Denver, began to show interest as early as 1869, when agitation was begun by the Pueblo Chieftain which led to the organi-

zation of the Agricultural Society of Southern Colorado. Officers chosen at a meeting in Pueblo February 22, 1870, were the following: M. L. Blunt, Pueblo County, president; Ferdinand Meyer, Costilla County, vice-president; G. W. Morgan, Pueblo County, secretary; John A. Thatcher, Pueblo County, treasurer. An executive committee was appointed consisting of one man from each of the counties of southern Colorado: John W. Prowers, Bent County; W. H. Young, Greenwood County; Henry Daigre, Huerfano; Felipe Baca, Las Animas; H. B. Ring, El Paso; W. J. Godfrey, Saguache; John Locke, Fremont; Celadon Valdes, Conejos; John Christian, Summit; Samuel Hartsell, Park; George E. Shaw, Lake.

Comment of the Pueblo Chieftain on this subject under date of November 11, 1869, was: "The Territorial fairs held at Denver and the efforts of the society in the northern part of Colorado, has been productive of much good, both at home and abroad, and too much praise cannot be given to those who have labored and aided to establish and carried forward their interests. But that society in the Platte Valley, and whose exhibitions are held in Denver, never has been and never can be territorial."

RAILROAD BUILDING ENCOURAGED

All of this had been going on before there was a railroad in the Territory. Strenuous efforts had been made to induce the Pacific railroad to build to Denver, but it passed by on the north, because of the easier crossing of the Continental Divide in Wyoming. There were inducements in the way of freight traffic as will be noted from statistical information compiled by a committee appointed at a Denver mass meeting in June, 1866. This committee estimated that 104,000,000 pounds of freight had been brought into the state during the three years previous and that the transportation cost on this averaged ten cents a pound. The charges for wagon and stage transportation ranged from 8 cents to 30 cents a pound making the cost of provisions, labor, and machinery so high that, "probably nine-tenths of the miners have been compelled to suspend operations."

As to agricultural resources, this report showed 210,000 acres of land entered at the United States Land Office from the day of its opening, October 5, 1863, to the last of June, 1866. In addition 190,000 acres had been claimed and settled upon, "but as yet unpaid for," making the total acreage of land taken up 400,000 acres.

On this land, the report stated, the acreage in crop in 1866 was as follows: Wheat about 35,000 acres, corn about 35,000 acres, oats about 15,000 acres, rye and barley about 5,000 acres, otherwise cultivated and used about 10,000 acres. Total in crop 100,000 acres. The report continued as follows: "The average yield of wheat, corn, and oats for the

past three years has been as follows: Wheat 20 bushels per acre, corn 20, oats 30; other grains in like proportion. * * * The amount of agricultural lands in Colorado cannot be estimated at less than two and one half million acres and of the lands now taken by actual settlement three-fourths are susceptible of cultivation and may be profitably farmed."

The report bore the signature of C. D. Clements, chairman. The remarkable feature of it is the even division between corn and wheat, the two leading grain crops of the pioneer period. It has been generally believed that very little corn was grown in the first decade, but the records show otherwise. In a few years the proportion of wheat to corn changed, as corn was found to be uncertain of maturity. Some sections never abandoned the crop, but continued growing corn until the time in later years when standard varieties were adopted to suit the various localities, with their differing altitude, varying moisture conditions and variation in length of growing season.

EMIGRANTS STILL COMING.—When the above report was made, emigrants were still coming across the Plains by wagon train in great numbers, using three routes, the Platte, the Republican and the Arkansas. Noting the week's arrivals over the Platte route at Kearney, Neb., *The Herald*, published at that point, had the following list which was reprinted in *Denver* under date of June 13, 1866:

June 1st, Conductor Sam Tate; 40 ox wagons, 71 men, 62 revolvers, 21 guns, bound for Julesburg.

Conductor G. W. Trotter; 37 ox wagons, 41 men, 41 revolvers, 21 guns; bound for Denver.

Conductor David Wertman; 28 ox wagons, 36 men, 21 revolvers, 27 guns, 3 women, two children; bound for Denver.

June 3rd, Conductor J. Boorey; 30 ox wagons, 40 men, 12 revolvers, 20 guns; bound for Denver.

Conductor E. H. Hall; 43 ox wagons, 38 men, 20 revolvers, 17 guns; bound for Denver.

June 4th, Conductor Chas. McEwan; 41 ox wagons, 51 men, 10 revolvers, 30 guns, 4 women, 6 children; bound for Denver.

Firearms were important at that time, as Indians constantly beset the trails and attacks on wagon trains were frequent.

Here was a good prospect for passenger business as well as freight for the projected railroads to the Rocky Mountain country.

The range livestock industry was getting under way by this time, the Abilene movement having begun in 1867, and for some years beginning about 1875, general farming in Colorado was eclipsed by the cattle trade. That story is told in detail in another chapter.

There was one exception in Colorado, that of the Union Colony at Greeley, where small farms were the rule from the beginning while all else agricultural in Colorado was on the magnificent scale of the open range.

People spoke of ranches, not farms, and some of these ranches were truly vast estates, such as the American West will never see again.

A RANCH 100 MILES SQUARE.—Hermosilla Ranch on the Las Animas grant was one of these large establishments described in detail by a contemporary writer in January, 1868, as follows:

The morning of the 24th we were waited upon by Colonel William Craig's ambulance as a substantial earnest of a previous invitation to visit his great Hermosilla ranche * * * His estate—the Las Animas grant, in which he owns a large interest and has entire control—is really a principality in its vast extent. It contains rivers from source to mouth; plains across which the eye cannot reach, and mountains and hills in endless variety. To speak plainly, it is more than 100 miles square. * * * On the Huerfano River, just below the mouth of its canon and 18 miles from the Arkansas River, the Colonel has chosen his home. Here he has a fine and commodious mansion, elegantly furnished; barns, stable, store, shops, ice house, etc, etc. On the neighboring hills are thousands of sheep, hundreds of cattle and scores of horses, whilst in the valley of the stream are hundreds—perhaps thousands—of acres cultivated to corn, wheat, oats and other crops. A splendid grove of trans-planted trees is fast enveloping the house; acequias meander through the grounds in every direction; a reservoir nearby supplies a fountain in front of the broad piazza and clematis and virginia creepers are trained to the cornices. A couple of thousand fruit trees, vines and shrubs have just been received, and will add to the attractions of a modern Eden; a veritable oasis in the Great American Desert.

REVIEW OF AGRICULTURE IN 1868

THE THOMAS TOURS.—No better record is obtainable of the status of farming in Colorado during the latter sixties, just before the range live-stock industry had its beginning, than that given in a series of letters, written by Dr. William R. Thomas of the Rocky Mountain News. Dr. Thomas later became a member of the faculty of Colorado Agricultural College.

His tours of the agricultural districts were made during May and June, 1868. His first letter, published under date of May 20, detailed a trip on horseback up and down the Platte from Denver to the mouth of the canon, during which he visited 55 farms. The total acreage listed as being under cultivation in that 20-mile strip was 2,977½ acres. The crops were as follows: Wheat, 1,241½ acres, oats 593½ acres, corn 395 acres, barley 180 acres, rye 26 acres, and potatoes 307 acres. In the potato acreage one-third was credited to Rufus "Potato" Clark. There were also several patches of beans, ranging from one to four acres, and over two hundred acres in garden and miscellaneous crops.

FARMS ALONG THE PLATTE.—The letter indicated that Thomas had visited all but two ranches on the upper Platte. He details some of the yields per acre, stating that Peter Magnes in 1861 got 3,300 pounds of barley from 70 pounds of seed, which is at the rate of 66 bushels to the acre. J. M. Brown had raised 70 bushels of wheat to the acre. In 1866 Mr. Skelton got 65 to 70 bushels of barley and 60 to 65 bushels of oats

to the acre. J. S. Jones had raised four tons of hay per acre from ten acres of bottom land, and from $2\frac{1}{2}$ acres he sold \$1,500 worth of potatoes. R. S. Little raised 50 bushels of wheat, 50 of barley and 60 of oats to the acre. Average yields on the 55 farms visited were 30 to 35 bushels of wheat, and 35 to 40 bushels of oats and barley to the acre. Hungarian grass had yielded three tons of hay to the acre.

Dr. Thomas' general comment on the appearance of the upper Platte Valley was as follows: "In riding through this rich and fertile valley, we were struck by the visible signs of improvement on every hand. The log cabins of '59, '60 and '61 stand in marked contrast to the neat and comfortable frame and grout farm houses, within which comfort, contentment and happiness reign. Many farmers are beautifying their places by planting shade and fruit trees."



The oldest standing farm house in Colorado. Cabin of Mariana Modena, three miles west of Loveland, built in 1858.

The next journey was up Bear Creek, where 19 farms were visited, among them those of John and Isaac McBroom, well-known pioneers. John McBroom had filed on the first water right on Bear Creek. The crops included wheat, oats, barley and potatoes, and in a few cases there were small corn fields instead of barley. On one farm Thomas found ten acres in buckwheat, and all farms had potatoes. Only three farms were missed on this part of the tour.

JOURNEY UP CHERRY CREEK.—A 75-mile ride up Cherry Creek was reported in the Weekly Rocky Mountain News of May 26, 1868, from which the following is quoted: "Our road lay up the valley of Cherry Creek, which is more sparsely settled than we had expected to find it. The bottoms are broad and the soil is rich and fertile, but the noted uncertainty of the stream in furnishing water for irrigation, has prevented the influx of a large population into the valley."

Twenty-one farms were visited by Thomas on this tour, including those of A. H. Miles and Levi Booth near Denver. Here the investigator found a greater variety of crops because of the proximity of Denver. Miles had 60 acres in corn, 50 acres in potatoes, 5 acres in strawberries, 2 of Mexican onions, 3 of melons, 1 acre of beans and 4 acres of miscellaneous garden crops. Miles was also growing asparagus, having 500 plants in his garden.

About one-third of the farms were visited on the Cherry Creek tour, no lateral roads being covered. Thomas mentioned that summer showers made irrigation "unnecessary most seasons."

WRITES FROM PUEBLO.—After a trip down the Fontaine Valley he wrote from Pueblo, under date of June 1, 1868, that he had visited 86 farms, missing only two on the way. Here he found a distinct change in the crop list, corn being the principal crop. The total acreage listed was 6,148, of which 2,870 acres were in corn, 1,555 in wheat, and the balance in oats, barley and other grains. Acreages of corn ranged from 50 to 240 acres per farm. The average yields of corn were 25 to 30 bushels, wheat 25 to 35 bushels, oats 45 to 60 bushels, and barley 40 bushels per acre.

The letter stated that at Pueblo all dealers advertised "grain taken in exchange for goods."

LARGE CORN FIELDS.—The valley of the Huerfano was next visited, a letter under date of June 17, 1868, written from Fort Reynolds on the Arkansas, giving an account of this part of the tour. Thomas explained that there were two settlements, one below the canon with scattering ranches to the Arkansas, a distance of 28 miles. The other was known as Upper Huerfano, with a farming district 20 miles in extent. The largest ranch in this district was that of Colonel William Craig, the Hermosilla Ranch, described elsewhere, which was a part of the Las Animas Grant. When Thomas visited the ranch he found 700 acres in corn, 400 acres in wheat, 100 in oats, 200 in beans, and 40 acres in garden, a total of 1,440 acres under cultivation.

The Doyle Estate, near the Craig ranch, had 500 acres in corn, 400 in wheat, 10 in oats, 90 acres in beans, and 25 acres in garden, a total of 1,025 acres under cultivation. Another in the same section was the ranch of N. W. Welton, with 600 acres in corn, 100 in oats, 20 in wheat, and one acre in garden, a total of 721 acres under cultivation. Eight other large ranches were visited, Thomas reporting nearly 5,000 acres under cultivation on the lower Huerfano.

"Corn grows most luxuriantly in the lower valley, while wheat thrives better near the mountains," was the comment of the writer. He reported that corn averaged 30 to 50 bushels per acre.

It was from the Doyle Ranch here mentioned that a wagon train of 28 loads of corn came to Denver in the fall of 1860, as mentioned on another page.

From Pueblo down the Arkansas, a distance of 30 miles, 29 farms were visited on the north side of the river, but there were only four or five on the south side. As on the Huerfano, corn was the principal crop, with wheat ranking second.

Nine ranches were visited on the St. Charles, where conditions were found practically the same as on the Huerfano, among the places being that of Peter Dotson, which is described on another page.

WESTWARD TO CANON CITY.—Thomas next went westward from Pueblo to Canon City, a report of this part of the tour being published in the Weekly Rocky Mountain News under date of July 1, 1868. He found very little land under cultivation from Pueblo to the mouth of Beaver Creek, but above that point, on the Beaver and on Hardscrabble, there were 66 farms in a high state of development. Among those visited were such well-known pioneers as Jesse Frazier, G. and B. F. Rockafellow, W. A. Helm and J. W. Chatfield. Corn was the principal crop, over 1,200 acres being listed, with wheat second at 847 acres. Thomas missed four or five farms, but reported a total of 2,800 acres under cultivation.

Concerning the development of irrigation in the Canon City district, Thomas said: "The farming lands in the neighborhood of Canon are covered by large irrigating ditches. The Canon City ditch is six miles long, 13 feet wide and 2 feet deep. It was constructed at a cost of \$12,000 and covers not less than 1,800 acres of land. The Canon City and Four Mile ditch is 6 miles long, 7 feet wide, 2½ feet deep and cost about \$5,000. It covers about 1,000 acres of land. These two are on the north side of the river. On the south side are also two large ditches, with a combined length of 7 miles * * * and covering about 1,500 or 2,000 acres of land."

ALONG THE CUCCHARAS.—An interesting description was given of farming in the Cucharas Valley from interview with W. W. Jones, Thomas not having time to visit that section. He spoke of the ranch of Colonel J. M. Francisco and Henry Daigre, who were in partnership, their holdings extending from the mountains down the valley for 20 miles. Under cultivation on this ranch there were 735 acres, 500 of which were in wheat, 200 oats, 25 corn and 10 acres in beans. This ranch had been under cultivation five years, but extensively so only during two cropping seasons. Over 1,000 head of cattle were being run on the grass. The letter went on to state that from the Francisco-Daigre ranch down the creek to Union Crossing the settlers were nearly all Mexicans, who were growing wheat, oats, corn and beans.

During the latter part of July, 1868, Dr. Thomas visited mountain farmers up the Platte at Bailey's and Slaght's. He found good crops of wheat, oats, rye, potatoes and other vegetables, mentioning Gueraud's, Danforth's, the Omaha Ranch, and other mountain resorts and farms.

EARLY CROP SHARING.—While touring among the farmers in southern Colorado, Dr. Thomas investigated the system of tenant farming, which

was being developed there with Americans as landlords and Mexicans as tenants. Writing under date of June 17, 1868, he said:

In the valley of the Huerfano, I find the ranchman and his planters. The planters are mostly Mexicans, some few Americans, who secure as many acres as they can profitably work and are furnished with seed, teams and the necessary implements and at the end of the season return one-half of the crop to the owner of the land. Water for irrigation is also furnished to the field and main ditches. In some cases a small supply of provisions is also included in the arrangement. While this mode of securing the cultivation of large tracts of land is free from all the harsh features, both of name and practice which have characterized similar systems, it also is remunerative to both parties.

While I believe the system is calculated to benefit both the ranchman and the planter, I am also convinced that it will have to be perpetuated by Mexicans rather than by Americans. The newly arrived immigrant will seize the opportunity to rent say 100 acres, and by care, industry and economy, will in three or four years accumulate sufficiently to purchase an equal number of acres for himself. * * * The American will only rent until he is able to buy, while the Mexican finds it better than anything else he can do, and is perfectly willing to remain a lifetime provided he has a house to live in and enough to eat.

COMPLETE PICTURE OF FARMING.—The Clear Creek Valley from Denver to Golden, with adjacent small farming areas, and later the valleys of Boulder Creek, the St. Vrain, the Big and Little Thompson and the Cache la Poudre were visited by Thomas and described in the same detail given in the letters from Southern Colorado, the whole series forming a complete picture of agriculture as it existed along the eastern slope of the mountains in the years following the close of the Civil war. Scarcely any reference is made in these letters to range livestock, because grazing as a separate business had not yet become important.

TRUE AGRICULTURAL SOCIETIES

Reference has been made to the fact that the Union Colonists at Greeley were exponents of the small farm and of intensive agriculture. It is not surprising, therefore, that they should prove also the pioneers in forming agricultural societies that had improvement of farming as their chief purpose. Although the Colorado Agricultural Society, formed in Denver in 1863, served a useful purpose in sponsoring the annual fairs and spreading abroad knowledge of the opportunities in farming for emigrants from the States, it had little direct influence on the practice of farming, nor was its membership composed principally of farmers. It was an association for the purpose of giving the farmer an opportunity to show his products in a competitive way and thus to influence further settlement and development.

A different type of organization was that started by the Union Colony at Greeley in its first year. This was an association of actual farmers for the purpose of discussing the technical side of farming and to exchange ideas that might be helpful to the membership in the conquest of the soil

under the new conditions which a semi-arid climate and the use of artificial watering imposed upon the colonists. It was the beginning of farmers' institutes in the form already familiar to the eastern states but new then to rural Colorado.

SUGGESTS AN "INSTITUTE."—The first discussion of the question came from the leader of the Colony in the official organ, *The Greeley Tribune*, of December 7, 1870. The suggestion was for the organization of "what might be called the Colorado Institute, the object being to advance the interests of agriculture, horticulture and the mechanic arts." Meekers' original plan was to make the Colony organization the nucleus of a state-wide educational organization of Colorado farmers receiving his inspiration obviously from the plan of the then new agricultural colleges which were organized for the purpose of teaching "agriculture, horticulture and the mechanic arts." While his plan was not carried out fully in the form originally proposed, there was organized nevertheless, a Farmers' Club local to the Colony and from that beginning similar clubs were organized later in other sections of the state through Colony influence.

FIRST FARMERS' CLUB.—On December 28, 1870, report was made of the organization of this first Farmers' Club, fifty persons attending the meeting in Colony Hall, thirty-five signing the membership roll and paying the fee of \$1.00. Officers chosen were: David Boyd, president; J. Max Clark, secretary; N. C. Meeker, treasurer. It was decided to have the first regular institute December 30, and tree planting was the subject to be discussed.

This subject brought out a good attendance and a lively discussion took place, principally on fruit trees. Meeker wanted everybody to plant all kinds of fruit. J. Max Clark suggested only the hardier fruits, such as apples and cherries, expressing the fear that peaches and pears would not thrive, because of the rigors of the climate. Some farmers followed Meeker's suggestion, while others took the advice of Clark, whose judgment was later vindicated.

Other meetings were held that winter and in the fall of 1871, announcement was made that the winter meetings would soon be resumed. It was stated at the time that the one dollar membership fee carried with it the privilege of buying seeds, plants and trees at club rates.

CLEAR CREEK FOLLOWS SUIT.—The next event of importance was the organization of the Clear Creek Farmers' Club, at the Arvada school house October 10, 1872. Meeker had been invited to address the club and he spoke at length, telling how the Greeley club was functioning and making suggestions which the Clear Creek farmers followed in the organization of their club. About forty signed the roll. The discussion at this first meet-

ing was largely on the fence question. The range industry had been growing rapidly and stray cattle were causing much damage to crops.

MEEKER PRAISES PIONEER FARMERS.—Meeker was impressed with the earnestness and character of these Clear Creek pioneer farmers, most of whom had located there during the days of the gold rush. In giving an account of the meeting in the Greeley Tribune (January 10, 1872), he said:

“The conclusion we would draw is that there is a superior class of farmers, not so naturally, but made so from the circumstances. They came to Colorado as adventurous men, and they no more than represented their class in the states. But here they found entirely new conditions, and for several years difficulties and misfortunes made it a question whether they could sustain themselves. At last, however, their irrigating canals, their fences and other necessary improvements were completed. Nature seemed more kind and they are now on the high road to prosperity. They find a ready market in Denver to which they can go and return twice a day, for whatever they can produce, and their lands sell, when any want to sell, from \$50 to \$150 per acre. Perhaps the average price in Clear Creek Valley is \$75 an acre. * * * They have successfully overcome the disasters which thickened previous to 1869, are independently rich, and we judge that the yearly products of their farms range from \$1,000 to \$6,000; perhaps the average is \$2,000.”

Meeker declared that the success of the Clear Creek Valley farmers was highly encouraging to the Union Colonists who possessed equally good land, and had the additional advantage of the Colony organization, which gave each farmer his town place in addition to the land farmed.

Meeker's testimony to the successful development of the first extensive farming settlement of Colorado was heartening to the Union Colonists, some of whom were showing discouragement. While they lacked the nearness of a big consuming market which Denver offered at the east entrance to the Clear Creek Valley, and the adjacent mining camps which witnessed the first gold rush with its insistent call for food and feed, the Union Colonists made up for that in the cohesive power of colony organization, through which they were able to build larger irrigation works and to develop outside markets for their surplus products in a manner unfamiliar to the pioneers of Clear Creek Valley.

UNION OF ALL FARMERS' CLUBS

The subject of a union of farmers' clubs in the territory also was discussed at the Arvada meeting. The president was instructed to request each club in Colorado to appoint three or more delegates, to attend a meet-

ing at Denver early in December, at which a territorial union of farmers' clubs was to be formed. Leadership in the Clear Creek Valley organization was taken by L. K. Perrin.

The general organization formed at a meeting in Denver in the spring of 1873, was known as the "Colorado's Farmers Union" and its first officers were: George F. Packard, president; R. S. Little, vice-president; W. Holly, secretary; J. C. Feebles, corresponding secretary; Dr. J. H. Morrison, treasurer. In August, 1873, the organization had a membership of thirteen clubs, all in northern Colorado and averaging about thirty members each. President Packard made a public statement of the purposes of the organization, denying that it had any political significance, other than that its members intended to "take a greater personal interest in governmental affairs." He declared that the farmers "must emancipate themselves from the control of professional politicians who are accustomed to get office at whatever cost or expense. Candidates for office who propose to buy their way into power should be made to understand that there is a limit to such practices."

At that time the question of federal aid in the development of irrigation was being agitated. President Packard was asked regarding the stand of the farmers' clubs on this question. His answer was: "It will be thoroughly investigated and an effort made to secure direct aid from Congress, which we can obtain if properly represented as the desire of the whole people."

OPPOSE FEDERAL AID.—In spite of this statement the farmers opposed the memorial resolution adopted at what was known as the Irrigation Convention in Denver in 1873, on the ground that its proposals were in the interest of land speculation, instead of orderly development of agriculture. The opposition to the memorial was led by the Union Colony Farmers' Club.

Packard denied that there were any differences between the farmers and stock raisers of Colorado. However, these differences were showing up and they developed soon into a distinct line of cleavage between general farming and the range industry. That subject is discussed in detail in the chapter on Range Livestock.

During 1873 farmers' clubs got under way in Boulder County, lively meetings being held, such problems as irrigation, corn growing, potato growing and the like being discussed. However, the organization of clubs in Boulder County was not the first effort of the farmers to associate themselves for purposes of improvement and education. A farmers' convention had been held at Boulder at the time of the Boulder County Fair, October 15, 1869. This was attended by men from Larimer, Weld, Boulder, Jeffer-

son and Arapahoe counties. At this convention it was recommended that one or more farmers' clubs be organized in each of the districts of the territory "for discussing all subjects in which agriculturists, fruit and stock growers are interested." Each club was to be represented at a territorial convention held annually. The object of this convention, according to an announcement made in the Boulder News, October 12, 1869, (the first issue of that newspaper), was "for the protection of farmers against depreciating prices of farm products by speculators," etc. Nothing came of this movement in a general way and it remained for the Union Colony to take up the matter and push it to successful conclusion, as has been related.

LIST OF FARMERS' CLUBS.—The farmers' clubs of 1873 and their officers were as follows:

Colorado Farmers' Club, Greeley; organized December 23, 1870.

Clear Creek Valley Farmers' Club; organized January 4, 1872, with L. K. Perrin, president, and L. A. Reno, secretary.

Bear Creek Farmers' Club; organized December 23, 1872, with W. D. Arnett, president; G. W. Harriman, vice-president; Daniel E. Kurtz, secretary; A. McPheters, treasurer.

Wheat Ridge Farmers' Club; organized December 28, 1872, with Wm. Lee, president; M. N. Everett, first vice-president; J. W. Robb, second vice-president; David Brothers, treasurer; George Yule, secretary; James F. Wilson, corresponding secretary.

Denver Farmers' Club; organized January 9, 1873, with Dr. J. H. Morrison, president; J. Y. Dillon, vice-president; H. G. Wolff, secretary; J. W. Weir, treasurer.

Lower Boulder Farmers' Club; organized February 3, 1873, M. S. Harmon, president; R. W. McIver, vice-president; H. Ruck, treasurer; G. X. Young, recording secretary; W. O. Wise, corresponding secretary.

Bergen Park Farmers' Club; organized March 1, 1873, T. C. Bergen, president.

Ralston Farmers' Club; J. A. Higgins, president; Leander West, secretary; J. H. Shay, corresponding secretary.

Littleton Farmers' Club; organized February 6, 1872, J. W. Bowles, president; John McBroom, vice-president; Henry E. Allen, secretary, L. B. Ames, treasurer; J. D. Hill, librarian.

Cherry Creek Stockgrowers and Farmers Club; officers not given.

CLASS CONSCIOUSNESS AROUSED.—These were the first indications of class consciousness among the farmers, the signs of healthy discontent that led to better economic conditions; the evidence that the organized farmer

could uphold or defeat a political issue, or fight successfully the threat of water monopoly that was imminent in the eighties. While the farmers were seldom united on any big issue they were able, nevertheless, to voice their desires in legislative matters. Where these were in conflict with the designs of the cattle industry, the cattlemen usually won out over the more conservative and less assertive crop-growing farmer.

TERRITORIAL PERIOD ENDS.—The days of the stagecoach, the pony express and the ox team now were definitely over; the railroads had reached the Rocky Mountains and rapidly as men could do it, lines were extended into every mining district, to remote corners of the Territory, where the Redman still claimed the country. The last barrier to progress had thus been removed and the plow still followed the miner's pick. Where the wagon caravan had brought its scores, or hundreds, the railroads now brought thousands of new settlers. Politically there was much commotion in the period immediately preceding statehood, but all classes of citizens looked forward to that event as the culmination of the hopes of the pioneer state builders and the beginning of a period of rapid progress.

CHAPTER III

Early Years of Statehood

Eighteen seventy-six was an eventful year for Colorado, as for the nation. It was the nation's centennial and Colorado's advent as a state. Agriculture, no less than other industries, had something to look forward to after going through the pangs of pioneering. Those who might have felt that the industry was now established and that its progress would go forward in more orderly and commonplace fashion reckoned erroneously. Mining had lost its fascination for all but the practical miner. There were still bonanzas to uncover and fortunes to be made and lost in the quest for gold and silver, yet it was recognized that capital is the limiting factor in development, that dust and nugget finds by grub-staked prospectors, now belonged in the realm of romance and that business men and bankers were in control of mining.

In agriculture, too, the pioneer period had been adventuresome and now its frontier aspect and its isolation were giving way to more settled conditions. The Indian menace had almost disappeared, and it seemed that farming, as distinguished from stock raising, was about to settle into a humdrum round of sowing and reaping, as back in the states. Whatever might have been the contemporary feeling, looking back now over a fifty-year period, the historian finds crowding in a succession of events and incidents alive with the elements of human progress and accompanied by the usual features of strife and drama.

PLAGUE OF LOCUSTS.—The year 1875 marked the bottom of the period of depression that followed the panic of '73. General industrial despondency was heightened in the plains region, which included the thinly settled portion of eastern Colorado, by a plague of locusts, such as had not been witnessed in American history. Records of this visitation are a unit in declaring that agricultural crops were devastated throughout the region now known as the wheat belt of mid-western America. The full extent of suffering dawned on the people early in 1876, when the Secretary of War made his annual report on what he designated as the "grasshopper appropriation," which he dispersed in relief work. The sum so used was \$138,000, which went for food and clothing for farmers whose crops had

been literally eaten from the face of the ground by locusts of the type now ordinarily referred to in the West as grasshoppers.*

SETTLERS ARE RATIONED.—In the Department of the Missouri, which included the territory of Colorado, 591,990 rations were issued by the Secretary of War to 64,440 persons; in the Department of Dakota the number was 283,996 rations to 13,869 persons, and in the Department of the Platte, 1,081,122 rations were issued to 29,226 persons. Besides the food 10,000 army overcoats, 4,000 uniform sack coats, 15,000 pairs of shoes, 4,000 pairs of boots, 4,000 hats and caps and 9,000 blankets were, to quote the report, "divided among the naked." Utter destitution followed in the wake of the locusts, which descended in great swarms upon an already impoverished pioneer population on the newly settled plains.

LOCUSTS COME AGAIN.—Disappointment was in store for those who believed there would be no return of the locusts in 1876. With the opening of spring, reports began to come in, indicating another invasion. "Myriads of grasshoppers are being incubated on the barren summit of Table Mountain overlooking the town of Golden." "The farmers are plowing along the line of the Platte Ditch and turning up millions of grasshoppers in embryo." Such were the reports presaging trouble for the farmer. In March a committee, composed of William D. Arnett and M. E. Everett, went to eastern Kansas to solicit seed, many Colorado farmers being destitute and having no seed to plant, nor money with which to buy it. This committee was duly accredited by Governor Routt and, while there is no public record of results, it is to be assumed that the farmers to whom appeal was made responded liberally.

Central and western Kansas certainly had nothing to offer either of seed, money or food, for destitution was the rule among the plains farmers in 1875. Every conceivable avenue of earning was invaded by the settlers to keep body and soul together. Bleached bones of the bison, slaughtered in years gone by, now proved a source of income along the line of the Kansas

*Rocky Mountain Locust—The so-called Rocky Mountain Locust or grasshopper (*Melanoplus spretus*), which caused such consternation to the early settlers of the western United States and Canada in the early 60's and through the 70's, is probably a menace of the past so far as its migrations in great swarms are concerned. Its depredations covered an area from eastern Oregon to western Iowa, and from Manitoba to Texas, and included high mountain areas at least to 12,000 feet. The earliest records of this locust in Colorado are for 1864. Later, extensive flights occurred in 1866, 1874, 1875 and 1876. Usually injuries to crops were most serious in those years immediately following the arrival of the swarms because of the large numbers of eggs that were deposited to hatch the following spring. The permanent breeding grounds were in the mountainous areas and the migrations were nearly always eastward and usually in a southeasterly direction. The adults would take wing and go in search of food, when the food supply on their breeding grounds in the mountainous areas became exhausted. The typical long-winged migratory locust (*Melanoplus spretus*) has become practically extinct, no flights of importance having occurred for many years, the last important flight in Colorado being recorded in 1876. There is considerable reason to believe that *M. spretus* was only a long-winged variety of our common and ever-present Lesser Migratory Locust (*M. atlantis*). No longer do we fear the devastating swarms of *spretus*.—C. P. Gillette, State Entomologist.

Pacific, in western Kansas and eastern Colorado. Contractors paid \$5 a wagonload for bones and a bone picker could make an average of \$1 a day by traveling over the prairie and collecting skeletons which were shipped to the button and fertilizer factories. So the Colorado Seed Committee no doubt had to go to the Missouri River to carry out their mission.

CROPS LOOKED PROMISING.—Rainfall during the spring of 1876 had been ample and there was hope of a plentiful harvest. A crop report appearing in the Rocky Mountain News of June 23 reflected the outlook as follows:

The grasshoppers have almost disappeared—nobody seems to know when or in what manner. The streams are full of water and consequently the irrigation ditches have a full supply. Owing to fear of the grasshopper plague, a great share of the farm land already plowed was not planted. This has been partially remedied by planting later crops, but still many fields are yet idle. This will insure better prices to those who have crops, but it would have been immensely better for the territory if every acre of plowed land was now in tillage. For two years past, Colorado has been drained of money for wheat, barley, oats and corn brought from the East, and that is the main cause of our present universal poverty. Farmers especially, have suffered because they were producing nothing and had to purchase farm products from Kansas, Nebraska, Iowa and Missouri for their own subsistence. Now when crops shall be harvested, consumers will purchase from home farmers and the money will be measurably kept in circulation among our own people. There is also abundant growth of grass. Hay will be plenty and cheap. Pasturage will be good until next season. The unusual rains in May caused a luxuriant growth and now it is rapidly ripening and curing on the high plains and hills. This insures good winter feed for cattle, sheep and horses. There are a few localities where drouth has prevailed and the grass is poor but they are few and of limited extent. The cattle drive from Texas north this season will be from 325,000 to 350,000 head, a portion of which will naturally come to Colorado.

LIKE A TORNADO.—There was no serious damage from the locusts that had hatched out in the state, but, like a destructive tornado, unforeseen and impossible to forecast, came another visitation of the insects from the desert wastes of the Northwest. The first swarms reached the Platte Valley on August 2nd and these were followed by two other migrations, which left the ground bare wherever the insects settled to feed. They swarmed over Denver, and a contemporary account says: "At noon they looked like snowflakes in sunshine, filling the air thickly as far as the eye could reach. In the evening they literally covered walls, fences and pavements. Corn was stripped to the bare stalk. The trees were loaded with them. All kinds of garden vegetables were devoured rapidly and lawns and grass plats suffered visibly."

The superintendent of the Denver City Water Company issued an order allowing "parties having irrigating license to use water at any hour of the day or night for three days from date, if necessary on account of grasshoppers." Water was run in the irrigating ditches around the fields and over them to protect vegetation. Two days later practically no hoppers remained, reports indicating that they flew south at a great height and that "the Platte Valley is scourged in places for 75 miles from below

Evans up to the mountains." The second migration occurred on August 8 and, while few of the hoppers alighted around Denver, everything in the valley having been cleaned up, the foothills country was not so fortunate.

A DETAILED DESCRIPTION.—A detailed description is left us by the Central City Register, that town having experienced direct contact with a migratory swarm, its location amid towering mountains offering unusually favorable opportunity for observation.

"As the sun reached the meridian today," said the Register, "countless millions of grasshoppers were seen in the air while the atmosphere for miles high was literally crammed with them. They sailed by under the pressure of a light east wind in vast billowy clouds, the lower strata falling in a ceaseless shower on the ground, covering the streets, sidewalks, the exterior of buildings, jumping, crawling, crunched by every passing foot, filling the eyes and ears, and covering the garments of pedestrians, swarming everywhere in irrepressible currents. Looking toward the sun, every inch of space was filled with them as far as the vision extended. In fact, it seemed as if the whole universe was one whole vast-moving tide of grasshoppers and that universal destruction of vegetation marked their track."

Mountain sides around Central City were covered "as thick as rain drops in a hard shower."

Mexico and California had experienced similar visitations, though on a smaller scale, in earlier years. Utah had been invaded, first by crickets, then by grasshoppers. The first visitation was that of the Mormon cricket. This insect proved as devastating as the locust, but the crickets hopped and did not fly. Flocks of gulls from Great Salt Lake drove out the insects. The Mormon pioneers, ascribing this timely intervention of the birds to Providence, erected a monument to the gulls.* Colorado had no such fortunate aid from Heaven as that given the Latter Day Saints, but the pioneers were aroused and they gave thought and time to devising means of combating the locusts. In this they were joined by other western states. The Governor of Minnesota called a conference of governors to discuss grasshopper control. Colorado did not send a representative to the conference, but its deliberations were watched. People were skeptical concerning resort to political aid. The Greeley Tribune remarked, sarcastically, that the governors would probably discuss the subject "around dinner tables where wine will be plentiful, and they will probably favor the plan of catching the birds."

HOPPERS FROZEN IN SNOWBANKS.—Throughout the summer and fall locust damage was a subject of general discussion. On October 11 the Rocky Mountain News said: "Reports from the mountains say that the snowbanks on the summit of the range are covered with dead grasshoppers to the extent of many thousands of bushels. Their decay has been so great that the air is filled with the fetid odor which they exhale. It is supposed

*Baneroff's History of Utah, p. 281, Vol. XXVI, states that grasshoppers followed the Mormon crickets, adding variety to the diet of the gulls.

that in crossing they flew against the drifts and became chilled beyond the power of locomotion, thus falling a victim of old Jack Frost."

Damage seemed to have extended throughout the settled sections along the front range of the Rocky Mountains. From Colorado Springs came this report: "The festive hopper has come and gone, but fearful devastation has marked his progress through southern Colorado. From this point down the beautifully cultivated Fontaine Valley hardly a vestige of vegetation was left."

A GRASSHOPPER APPROPRIATION.—In his message to the First General Assembly of the State of Colorado under date of November 7, 1876, Governor John L. Routt urged a reasonable appropriation, "to be expended as your honorable body may direct, in the investigation of the history, haunts, and means of exterminating this insect and also that you by statute prohibit the destruction of insectivorous birds."

While no appropriation was made for this purpose, the legislature did pass a stringent law for the protection of insectivorous birds and discussed seriously a measure providing a bounty on hoppers. The bounty bill, which was killed, would have given county commissioners power to levy a tax and pay a bounty for each bushel or pound of grasshoppers, or each pound of grasshopper eggs destroyed. Claimants of the bounty were to be required to bring their kill to the office of the county clerk, or the nearest justice of the peace, where it was to be weighed or measured, whereupon they were to receive a certificate entitling them to the bounty, after making oath that the kill was made within the county limits.

PRICE OF HOPPER SCALPS.—Facetious editorial comment from the Rocky Mountain News was that the price of scalps be not fixed so high as to encourage propagation rather than extinction of the hoppers. "A fair price for a full bushel" was the motto recommended.

Not only the state and the West, but the country at large was interested in the locust migrations which had worked such havoc with agriculture in the region bordering the Rocky Mountains. The United States Geological Survey under Professor F. V. Hayden, gave especial attention to what was called the Locust Plague in its report for 1875 and '76. Dr. A. S. Packard, Jr., of Salem, Mass., was the member of Hayden's staff who was assigned to investigate locust damage. Among other interesting observations gleaned from Dr. Packard's report was this: "It has been sufficiently shown that a swarm of locusts observed by Professor Robinson, near the entrance to Boulder Canon, Colorado, traveled a distance of about 600 miles to eastern Kansas and Missouri." According to Packard, this swarm may have come from some part of Wyoming 200 or 300 miles north of here. "We should imitate on a grand scale the usage of the ancient Eryp-

tians under Pharaoh, who laid up in times of unusual harvests, stores of grain for times of famine," read the Packard report.* It was suggested that use be made of the United States Signal Service (now the Weather Bureau) in reporting the movement of locusts. It was recommended also that the various states appoint entomologists to co-operate with the federal government and with a United States Commission of Entomologists to investigate and issue bulletins of warning and suggest remedial measures.

CONGRESS CREATES COMMISSION.—Such a commission was created by Congress early in 1877 and an appropriation of \$18,000 was made for the purpose of carrying on the work outlined in the act. Dr. Packard was placed on this commission with Professor C. V. Riley, state entomologist of Missouri, and Professor Cyrus Thomas, state entomologist of Illinois. On April 18, 1877, the first bulletin was issued by the commission. Among the recommendations made for combating locusts were the following: Plow under the eggs at hatching time, plant early ripening corn, plant more leguminous and tuberous crops, use kerosene for killing the hoppers, dig ditches as barriers to the movement of the insects and in irrigated sections, cover the bottom of these ditches with water.

MANY DEVICES IN USE.—Many devices were being used by the farmers in the effort to save their crops. A description was given by the commission of a horse-drawn burner invented by J. Hetzel of Longmont. This machine was 12 feet long and 2 to 2½ feet wide, made of iron and set on runners 4 inches high. It was, in reality, a fire box covered with an open grate and burning pitch pine wood. The grate was made by a network of heavy wire. It was stated that two men and a team could burn 10 to 12 acres a day and kill two-thirds of the insects. Though recommended for trial by the commission, the machine was not in favor in Colorado, having been found impractical. The recommendations closed with the statement that chickens, turkeys, hogs and birds should be used for combating the pests.

The commission served its purpose and Professor Riley's prophecy, made in a report to Governor Anthony of Kansas, May 16, 1877, was fulfilled. He said, "When the locust scourge is fully understood and farmers unite in determined efforts to counteract it, it will cease to be so much of a bugbear, and no longer interfere with the settlement of the beautiful and productive western plains, which it visits at regular intervals."

A CROSS SECTION OF PIONEER LIFE

There was much of the dramatic in the life that the early settlers lived. There was danger from Indians, at times, and there were hardships due

*The Pueblo Indians, a pastoral people who inhabited Southwest Colorado and the adjacent region for centuries, followed the Egyptian practice, storing grain in seasons of plenty for the inevitable dry year. (See chapter on Irrigation, this volume.)

to the vicissitudes of weather and fortune, but the rank and file of the immigrants from the States were of the average American type of rural and urban citizens from New York, Pennsylvania, Ohio, Indiana, Missouri, Illinois; a few were newly arrived European immigrants, chiefly German. As in all movements that had preceded this last great westward tide, the forerunners had been trappers, hunters and adventurers, and it was the remnant of this class that furnished the highlights of tragedy and the glamour of false romance.

Colorado had its colorful atmosphere in the mining camps, where Chance and Luck beckoned and adventurers followed the lure of wealth, but these were not of the soil, and they gave little thought to the possibilities of agriculture. Sanguinary strife, too, was waged between the cattlemen and sheepmen over the possession of the range, but in this it was often the hireling rather than the owner of the livestock who did the gun-fighting, while those who had property at stake took it out mostly in the passing of defiant resolutions and in demands for drastic legislation.



A sod house on the plains in Morgan County. This was occupied in 1917 by Mrs. J. A. McMichael, aged 77, the oldest woman home-steader in Colorado.

Resort to arms, and occasional clashes were not generally between men of standing, and frequently whisky was the immediate cause that brought the flame of gunfire from a feud which, without drink, might have passed off in argument.

There is enough of drama, enough of the pinch of poverty, enough of disappointment, and on the other hand, a plethora of courage, strength, indomitable will and ingenuity in the record of the struggle to conquer the

land, without emphasizing what has too frequently been viewed as the important thing in pioneering, namely, the occasional brawl, the rare disorder in the community, or the calamity that struck down this or that one. Fifty years after the first events in an agricultural record of statehood days the average man is in far greater daily risk of life and limb than he was when Colorado became one of the great sisterhood of states.

FROM STURDY STOCK.—It was the sturdy stock that descended from our first New England settlers that came on in a perfect flood tide of immigration; the sons and daughters of those who had first gone west of the Alleghenies and into the Ohio and Mississippi valleys. The nativity of the Colorado pioneers, as shown by the census of 1860, was truly American. The state's population, according to that census, was 34,277 and their nativity by states was: Ohio, 4,125; New York, 3,942; Illinois, 3,620; Missouri, 3,312; Indiana, 2,587; a total of 31,611 of American birth with 2,666 foreigners. The census did not include Indians. A large proportion of those listed as foreigners were of Mexican origin.

The new Colorado citizens came from the English, Scotch-Irish, Dutch and German stock that settled the original thirteen states. Influx directly from abroad did not become appreciable until after the close of the Civil War and it was inconsiderable even then when compared to the foreign settlement of Nebraska, the Dakotas and Minnesota.

PURITANS AT HEART.—The pioneers who built the state were at heart Puritans, men and women who loved the church and who held the Bible sacred, who led moral and upright lives, who succeeded in writing into the charters of some of our colony settlements the fundamental prohibition against strong drink and whose influence later backed up the Drake local option law, followed by state prohibition, and who helped finally to put Colorado on record for the Eighteenth Amendment.

How is it, some may have asked, that Colorado, with a reputation for looseness in its early days, always stood strongly for moral reforms, when the question was brought home to the people? An answer superficially given would be, because of reaction from the extreme of border lawlessness. But the true answer is that lawlessness cropped out in spots, in the mining camps, in the larger cities, and in the cow towns, but that the great body of the people in town and country came of old American stock, traditionally sound in morals, true to the principles of the Christian religion and puritanical in tendency, rather than the reverse. Rural Colorado, from the beginning, furnished the essence of this sentiment, which became manifest in legislation and in reform movements.

LOTTERIES WERE POPULAR.—There was a time, however, when even the rural districts were wavering along one line and that was a form of

gambling which had a widespread vogue late in the seventies and in the early eighties of the nineteenth century. This was a plain case of corruption, beginning at the head of government, when the Louisiana lottery was sanctioned by its own state and permitted to operate branches, often with legislative sanction, in many other states.

Louisiana's bad example was followed by several other states, Kentucky among them, figuring prominently in the advertising of Colorado newspapers in the first year of statehood. Colorado was fertile ground for games of chance, as gambling was a common vice, unmolested by law and in some circles sanctioned by custom. So it was that farmers and ranchmen, too, were prone to take a chance, and many a dollar went for lottery tickets, the investor, like the promoter of the game, finding conscience salve in the theory that the end justifies the means. The Kentucky Cash Distribution Company was a lottery that, next to the infamous Louisiana State Lottery, drew much cash from the rural people of Colorado. This company was authorized by act of the Kentucky legislature to raise money for the benefit of the public schools of Frankfort. Its chief officer was an ex-governor of Kentucky. Its Colorado advertisements announced that a drawing would be held August 31, 1876, at which \$600,000 would be distributed, with a grand prize of \$100,000, and other prizes ranging from \$50,000, \$25,000, \$20,000, \$10,000, \$5,000 (one each of these big sums), down to smaller sums, to a total of 11,156 gifts. Tickets were offered at \$12 each with split tickets of various fractions at relative prices. Registered letter or express draft or postoffice money order "were accepted in payment of tickets."

Just about this time a fake concern known as the Wyoming State Lottery, which had never held a drawing, was trapped by the law in the East, and Congress was appealed to to close the United States mails to all lotteries, including what at that time were designated as the "legitimate" schemes, such as the Louisiana and Kentucky lotteries. While Congress barred these gambling schemes from the mails, they continued to flourish ten years longer by resort to express orders for remittances, with a resultant constant drain on the pocket, as well as the morality of Colorado's citizens, and very infrequent returns in winnings that occasionally went to an individual here and there. There was in operation a private lottery which had adopted the name "Colorado State Lottery," but which had no official sanction or backing.

FIGURES ON THE COST OF LIVING

Some idea of economic conditions in the year of statehood may be gained from a glance at current market reports.

American fat cattle were quoted $3\frac{3}{4}$ to 4c; Texas fat steers, $2\frac{1}{4}$ to $3\frac{3}{4}$ c; American milk cows, \$25 to \$40; Texas milk cows, \$15 to \$20; horses, \$100 to \$200; ponies, \$50 to \$100; fat sheep, \$2.50 to \$3.00; Mexican stocker sheep, \$2.50 to \$2.75; grade sheep, \$3.00 to \$4.00.

Hay was selling \$16.00 to \$20.00 a ton; oats, \$1.85 to \$2.00 cwt.; corn, \$1.45 to \$1.50 cwt.; wheat, \$2.50 to \$3.00.

Prices at retail of necessities on the Denver market, which was a fair gauge for other towns and cities, were: Beef, 8c to 10c a pound; mutton, 10c to 12c; poultry, 15c to 20c; bacon and ham, 15c to 20c; potatoes, $1\frac{1}{2}$ c to 2c; cabbage, 2c to 3c; butter, 30c to 40c a pound; eggs, 30c to 40c a dozen; flour, \$3.50 to \$4.50 cwt.; coal, \$4.00 to \$5.50 a ton; wood, \$6.00 to \$8.00 a cord.

The farmer or ranchman in the valleys who contemplated building could buy brick at \$5.00 to \$7.00 per thousand at the kiln, lumber at \$18 to \$20 per thousand for common and \$32 to \$40 for dressed, while shingles were selling \$4 per thousand.

COMPARISON WITH '59.—Contrasting these prices with the cost of necessities in 1859, it was clear that economic conditions had improved wonderfully. In '59 \$100 a thousand feet was the ordinary price for rough lumber, shingles were scarce and proportionately high, while shingle nails cost \$1 per pound. Flour ranged from \$20 to \$40 a hundred, while the "four favorite staffs of life, sugar and coffee, tobacco and whisky, were at times almost worth their weight in gold dust."

The last quotation is from a review of the early day history of the Pike's Peak settlement given by Prof. O. J. Goldrick, at Denver's Fourth of July celebration in 1876. Goldrick was superintendent of schools and a Fifty-niner. The fact that there were only three white women in "this cheerless country" during the first year of Denver's history, probably accounts for Goldrick's mention of sugar, coffee, tobacco and whisky as staffs of life. In that early day, flour was a scarce commodity, for Henry Ritze and Co., Denver's first bakers, carried this legend on their sign: "Gold dust, flour, dried apples, etc., taken in exchange for bread and pies." So the farmer in '76 considered himself well advanced over the newly-arrived immigrant of '59, who had to rely for sustenance upon game and such supplies as could be brought in by covered wagon.

SMALL FRUITS AND VEGETABLES.—Gardeners in the Clear Creek Valley between Denver and Golden and the Union colonists at Greeley, found small fruits and vegetables a ready source of income. From Greeley came the information that J. F. Sanborn, on the Eldridge place west of town, had two and one-half acres in strawberries from which he made sales on the local market and also shipments to Cheyenne. He also grew black-

berries and raspberries. The statement was made in the Tribune that enough strawberries were raised around Greeley to nearly supply the home demand. Hotel and family tables at Cheyenne were supplied with lettuce from Denver hot houses in May "for which luxury alone they pay on an average of \$700 a month," according to the Rocky Mountain News. Denver also supplied the Wyoming capital with cut flowers.

Crop conditions in the early summer of '76 indicated that the rainfall had been more than ample, for it was one of the wet years which so often fooled the early settlers into a belief that farming could be successfully carried on without irrigation or special methods of cultivation so necessary in a semi-arid climate. It was in '76 that Cherry Creek went on its most destructive rampage since the memorable flood of '64. Much damage was done not only in Denver, but to the farms and ranches up Cherry Creek and up the Platte and Clear Creek. In Denver the recorded rainfall for a period of 29 hours on May 21 and 22, was 6.70 inches.

FOOD PRODUCTION CONSIDERED.—Serious thought was being given to food production. The only staple food besides meat that was being produced and manufactured in Colorado in sufficient quantity to meet home needs was flour, and that was true up to 1873. In 1874 both wheat and flour were again imported, as had been done in the first five years of settlement. An estimate of produce brought into Colorado during 1874, with cost and freight, was made by The Rocky Mountain News (February 3, 1875), based on figures obtained from Mayor Barker of Denver and some of the leading merchants.

Produce was coming from both east and west, California and Utah shipping onions, cabbage and barley. Butter and eggs came from eastern Kansas and Nebraska. The figures show a lagging agriculture, due to two causes, namely: the plague of grasshoppers and the fact that attention was concentrated on the range industry. On most of the cattle and sheep ranches no attempt was made to supply even the home demand for milk, eggs and vegetables. Following is a tabulation of the imports of food and feed:

MUCH WAS SHIPPED IN.—Produce brought to Colorado during 1874:

133 cars of potatoes at \$250 a car.....	\$ 33,250
Freight on same	34,713
Eight cars of onions at \$300 a car.....	2,400
Freight on same from California.....	3,888
6 cars cabbages from California at \$300 each.....	1,800
Freight on same	2,916
3 cars cabbages from Salt Lake.....	1,050
Freight on same	783
80 cars barley from California.....	21,600
Freight on same.....	24,000
100 cars malt, cost and freight.....	80,000

1,200 cars oats, corn and chop, cost and freight.....	520,000
50 cars meal, cost and freight.....	25,000
50 cars wheat, cost and freight.....	22,000
Flour imported, cost and freight.....	50,000
200,000 pounds butter at 30c.....	60,000
225,000 dozen eggs at 30c.....	67,500

The News added to the estimate some miscellaneous items, which ran the total up to \$1,300,000 and then commented as follows:

“More land must be brought under cultivation and all branches of husbandry must be stimulated and improved. We say kindly but earnestly that the farmers and husbandmen of Colorado are not doing all they might do to avert this outward flow of money for produce and retain it at home.”

The cost of transportation, often exceeding that of the product itself, is still a factor in Colorado’s economic situation.

It will be noted that over half the value of imports was for oats and corn chop used for feed. Much of this went to the mining camps for work horses; some also for use in the City of Denver, where the work horse was the beast of burden and the carriage horse the motive power for pleasure vehicles.

WARNING AGAINST LAND BOOMS

The state’s agricultural progress was slow but sound from the very beginning. Light average rainfall and its great seasonal variation were discouraging factors. Few of the pioneers had a clear vision of what was in store for the farmer in future, either through irrigation or through the application of what were later termed dry-farming methods. As early as the year of Colorado’s admission to statehood, conservative men were already sounding a warning calculated to discourage land settlement by the inexperienced and the poor. The land boomer painted a rosy picture of the possibilities, but men who came early and tried farming found that, even in years when locust damage was slight, it was not an attractive calling for the indolent, or for the man of limited resources. Yields under irrigation were astonishingly large, when compared with farming “back east”; nevertheless, the farmer realized that he got results only at a cost of great effort in labor and outlay, and that he could leave nothing to chance in a country where the average precipitation was about one-third of that to which he had been accustomed. So it was that J. Max Clark, a Union Colonist of Greeley, faced conditions openly and told prospective settlers the truth about Colorado. In doing that he offset not only the optimistic statements of the land boomer, but also the discouraging stories that were taken back to the States by the army of “go-backs”—the unfortunates who came, tried, failed and returned to the Mississippi or Ohio valleys, broken in purse and spirit. There were many such who uttered the warning, “Stay away

from Colorado." The truth about Colorado's agricultural status, particularly that portion in which irrigation was being developed, was given in a statement of J. Max Clark, as follows:

No government lands can be obtained under any good irrigating ditch in Colorado and men with small means and large families are advised not to come here.

Farm laborers receive from \$25 to \$50 per month and board, and steady industrious young men can generally obtain employment during about eight months in the year.

Men of moderate means, say from \$2,000 to \$5,000 can, I think, make a better profit on their capital here at farming or stock raising than in any of the older states. I am speaking now of men accustomed to the business, for I know of no state in the Union offering fewer inducements to beginners in agriculture.

Improved 80 acres of land can be bought for from \$1,000 to \$2,000. Forty-acre tracts in proportion—buildings generally insignificant. More depends on the quality of the soil than on the value of the improvements, and unimproved lands accessible to water and well adapted to irrigation, bear about the same price as cultivated farms.

FAIRS SHOW DEVELOPMENT

THE FAIR OF 1876.—A review of the fair held at Denver in 1876 affords a good cross section of agricultural development at the time of statehood. A contemporary account tells us of its success as follows:

In the agricultural department, the display of vegetable growth is extensive and well selected. The Clear Creek Valley Grange has on exhibition a large amount of all varieties of produce among which are mammoth squashes, beets, potatoes and melons, besides some freshly cut grass measuring over six feet in height. The El Paso Cheese Company shows enough of that article to surfeit the whole state. Besides the articles mentioned there are jellies, apples, pears, and all other farm products in great abundance.

TYPES OF IMPLEMENTS.—The type of agricultural implements in use at the time is shown by the exhibits, which included Rock Island plows, Walter A. Wood harvesters, reapers and mowers, J. J. Case's steam thresher, Bain wagons, as well as hay presses, grain drills, sulky hay rakes and other horse-drawn riding implements. These implements were lined up for display and a street parade of them attracted much attention. There was a display of Colorado fruit, with W. A. Helm of Canon City carrying off the honors.

IN THE LIVESTOCK SECTION.—In the livestock section J. S. Maynard, a pioneer breeder of Carr, in Weld County, won first premium for best Shorthorn bull on Sunrise. This premium was a silver cup. First honors on dairy cattle went to S. H. Southworth on best sire in the aged class, the winning animal being Taylor's Duke, an Ayrshire bull, with J. E. Ayres a close second on Lord Sterling, a Jersey bull. H. G. Wolf received first premium in the aged sire class on Monarch, a Jersey bull.

FIRST PREMIUM ON BUTTER.—In dairy products J. D. Adams of Livermore, Larimer County, won first premium on tub of butter made in May or June, while second premium went to Mrs. H. D. Sherman of Evans. The exhibit comprised a twenty-five-pound tub or package. Smith Brothers of Denver won first and W. B. Alford second on September butter.

COLORADO-MADE CHEESE.—Another classification in this line was

"three or more Colorado-made cheese not less than fifty pounds made by a farmer." R. A. Strain was the winner. On factory cheese the winner was G. R. Gwillim of the El Paso Cheese Company.

Other premiums included "best sack Colorado-made flour," George W. Siegler; native plums, W. A. Helm, Canon City; best dressed buffalo robe dressed in Colorado by white man, \$10 in gold to W. A. Price, Colorado Springs. Collection of Colorado-dressed furs and Colorado-made fur gloves, W. A. Price, Colorado Springs.

The classification list included under horses, Thoroughbred roadsters, horses of all work, draft horses, saddle horses, carriage teams, and single driving horses. In cattle there were Shorthorns, Ayrshires, Jerseys and grades and crossbreds. In sheep the classification included fine-wool, long-wool and grades. There was also a class for best herd of cattle open to all breeds.

Poultry was well represented in the list of awards with these familiar breed names: Brahmas, Cochins, White Leghorns, Silver Spangled Hamburgs, Bantams, Bronze turkeys, White turkeys, Plymouth Rock hens and Black Spanish hens.

NO NEED OF RODEO.—The fair of 1876 had no need of rodeo, for the Wild West was all around and the effort was directed toward getting away from the influences of border sports, rather than encouraging what was then the routine of the day on the ranch. Still there was one attraction on this first state fair program which might be classed as a Wild West event.

It was advertised as a race between a fleet-footed darky from Pueblo and "Spotted Tail," a trotting steer, the negro to make his run on all-fours. Interest was keyed to a high pitch as the darky, grinning and confident, stepped out upon the course. However, his confidence and that of his backers was momentary, for "Spotted Tail" was off like a flash before the negro got "set." After this burlesque "Spotted Tail" and "Sitting Bull," both steers, furnished fun for the crowd in a race against time.

BOULDER COUNTY FAIR.—The third fair of The Boulder County Industrial Association in 1876 was held a short time before the Denver state fair. The exhibits there included one made by Lower Boulder Grange Number 15, who had "a good display of grains and vegetables, one exhibitor sending thirty-one varieties."

The Northern Colorado Agricultural Society bought an 80-acre tract for fair grounds in 1871 at Longmont and began to hold annual fairs soon thereafter.

SAGUACHE FAIR IN '77.—Saguache County held its first fair October 18, 19 and 20, 1877, some months after organizing an agricultural society and acquiring a tract of land for fair purposes. In the records of this first

fair in the San Luis Valley is a classification for sugar beets. Wales and Morse were winners in this class, having produced the "best beets," although it is not specified what the requirements for good beets were in those days. In spite of this start, far in advance of other agricultural counties that have since become noted for sugar production, the upper part of the San Luis Valley has never been developed as beet-growing territory. Another remarkable fact about this fair is "all expenses were paid and a small balance remains in the treasury."

Awards were granted in horses, cattle, hogs and poultry. Charles Hartman showed the best fat bullock, indicating that the finished product was even then the goal of the beef raiser. Among the winning exhibitors of horses was Otto Mears, known

in Colorado history as "the Pathfinder," who was the first settler in the town of Saguache, having located there twelve years before that fair was held. Mears was an authority on crop and mining conditions and his estimate at fair time, 1877, of the principal crops for the year in a ten-mile radius of Saguache was 45,000 bushels of oats, 15,000 bushels of wheat, 8,000 bushels of field peas, 37,000 bushels of potatoes and 10,000 tons of hay.



The Saguache Mill, which began operations in 1873.

THE SAGUACHE MILL.—Mears was having 1,000 sacks of flour from wheat of his own raising ground at the Saguache mill that fall. The peas, even in that early day, were fed to hogs, marking a start in pork production, for which the San Luis Valley was later to become noted. Surplus crops were marketed in the mining camps of the San Juan, which were then flourishing, and the farmers were well paid for their products.

FIGURES SHOW FARMING GROWTH

Though the outside world did not know it and even in Colorado it was not emphasized, it was a fact that, as early as 1877, agriculture and livestock combined had reached a value for the year practically even with that of metal mining. A summary of the state's productive wealth, covering 1877, was as follows*:

*While the figures on agricultural products probably were high, those covering the mining industry were no less so, consequently the relative importance of the two industries is apparent. No bureaus of statistics existed and estimates only were available.

Bullion	\$ 7,913,411
Cattle	2,233,200
Wheat	1,837,500
Other agricultural products	775,000
Hay	1,250,000
Coal	1,005,385
Wool, hides, etc.	1,340,000
Manufactured products	5,838,209
Total	\$22,252,705

Adding cattle, wheat, "other agricultural products," hay, wool and hides, sums up \$7,435,700, leaving \$477,711 in favor of bullion, which represents gold, silver ore and base metal bullion shipped. An analysis of the early agricultural estimates making up these totals indicates a wheat yield of 1,750,000 bushels at an average price of \$1.05 per bushel; this was the product of 70,000 acres averaging 25 bushels per acre. Corn was estimated at 250,000 bushels, valued at \$187,500 and grown largely along the Arkansas and its tributaries; oats, 125,000 bushels, valued at \$75,000; barley, 200,000 bushels, valued at \$150,000; potatoes, 325,000 bushels, valued at \$262,500, dairy and garden products, \$100,000; hay, 100,000 tons, valued at \$1,250,000.

The extent of the livestock industry is best given in the total figure for the year's shipments estimated at \$2,233,200. The market value of the wool aggregated \$900,000. Hides were estimated at \$250,000, tallow \$30,000, sheep pelts at \$150,000, furs \$10,000—an aggregate from these sources of \$1,340,000. This did not include horses and mules nor articles of manufacture from agricultural products. Agriculture seemed to be more than holding its own, having fully recovered from the depressing effects of the grasshopper years and the nation-wide business depression.

WHERE SABBATH QUIET PREVAILED

That all mining camps and settlements were not of the wild and woolly type is evident from travel letters which were a feature of the newspapers about the time Colorado became a state. Rapid progress was being made in the development of the outlying regions. From Hahn's Peak, Routt County, under date of July 20, 1877, a correspondent wrote:

One can but admire the excellent order prevailing here. The Sabbath is as quiet as that of a village in New England. The men are sober, intelligent gentlemen and on Sunday dress-up and go to church, whether they have a minister or not. The hour of worship is sacredly observed and a prayer meeting of half an hour is held from 7:30 to 8 o'clock in the evening. We have not seen, nor smelled, nor tasted liquor since we came here and, not being of the dry kind, it has been a luxury to see in these wilds a community that is sober, industrious and prosperous.

John V. Farwell of Chicago was interested in the development of that region. The International Company was spending \$60,000 on the ditch or flume one mile long, with a tunnel of 110 feet. An iron pipe line one mile long, carrying two thousand inches of water, was being constructed.

Two saw mills were in operation, cutting lumber to build houses. The correspondent reported that the flour, potatoes and fruits used in the new community came chiefly from Utah.

BY WAY OF CONTRAST.—In contrast to the peaceful Sabbath at Hahn's Peak is the description of everyday life at Lake City, written as of August 15, 1877, as follows:

The saloons, although required to pay a license of \$500 a year each, are the most largely represented of any one brand of traffic and if all the villainous whisky and stale beer held in solution by these resorts could be poured into one liquid mass it would form a reservoir large enough to float the Great Eastern. And yet these establishments do a swimming trade, the receipts of many averaging \$100 to \$200 a day. It costs something to live here. Flour retails at \$12 to \$15; hams and bacons, 25 to 30 cents; coffee, 45 to 50 cents; butter, 50 cents; potatoes, red, 8 to 10 cents; wild hay, the great proportion of which is brought from the main valley of the Gunnison, sixty miles away, ranges from \$80 to \$100 a ton. Milk, owing to the active competition of the milk peddlers, is about as cheap as at Pueblo or Denver and retails at 20 or 25 cents a gallon.

UTES STILL IN SOUTHWEST.—The Ute Indians were still in possession of the valleys in the San Juan country at this time (1877), but the upland on the borders of the reservation was being farmed, as is apparent from one of the travel letters quoted herewith:

Correspondence to the Rocky Mountain News, Lake City, May 26, 1877: Seven or eight miles before reaching Lake City, the road leaves the reservation and from there up, the valley and bench land is all claimed up. Much of this is fenced and considerable quantities plowed and planted to grain and vegetables. Water for irrigation is obtained from the little streams that come down from the mountains on right and left. A few patches of ground were cultivated last year and produced good crops. There are also a number of milk ranches that supply the people of Lake and the neighboring mines.

Saguache, June 13, 1877: (Route up Saguache Creek over Cochetopa): The land is all occupied by farms and mostly planted, or being planted to wheat, oats, peas, etc. The Mexican plan of irrigation is followed and it is much more perfect and systematic than ours in northern Colorado. The farms are now generally fenced. * * * It is estimated that ten thousand head of cattle and 800,000 sheep are in the country tributary to Pagosa Springs. Most of the sheep are owned in New Mexico.

HAD ALL THE LUXURIES.—That life was worth living in the San Juan country in those days is apparent from another letter by the same correspondent, who says:

To show progress of epicurean civilization 200 miles from the nearest railway and over three ranges of mountains still buried in snow at the beginning of summer. Sunday dinner at the Avenue Dining Room, Lake City, May 27, 1877: Soup Julienne, Meats—Roast beef, roast veal, roast pork with apple sauce, small ribs of beef, corned beef, boiled tongue, boiled ham. Entrees—Baked ham, braised mountain trout, pineapple fritters. Vegetables—New York browned potatoes, sweet corn, tomatoes. Dessert—Mince pie, lemon meringue pie, strawberry meringue, brandy jelly, sherry wine jelly, orange jelly, Boston cream puffs, assorted cakes, lemon ice cream, tea and coffee.

PIONEER FARMERS' PICNICS.—Farmers' picnics in pioneer days were pleasurable events. A favorite gathering place for those living along the Platte above Denver was the McBroom ranch on Bear Creek. The usual picnic day was the Fourth of July. Instead of, as now, each family seeking its own picnic spot and getting away as far as the automobile can take

them from home and neighbors, it was the habit in early days for whole neighborhoods to gather at one farm or ranch for the Fourth of July celebration. Town folks, too, attended these country picnics. The program would always include patriotic speeches. The McBroom cabin, around which the Platte River and Bear Creek farmers and ranchers were in the habit of gathering for picnics in the late sixties and early seventies, has been preserved as a memorial by the State Historical Society. It has been moved from its original location near Fort Logan to a beautiful spot in Turkey Creek Canon.

John McBroom staked out a claim on Bear Creek in 1859 and built the cabin and began irrigating crops under what is now known as Water Right No. 1, the first decree on Bear Creek. The Colorado Magazine of May, 1926, contained an interesting account of these early day pioneer picnics by Albert B. Sanford, curator of the State Historical Society.

SANFORD DESCRIBES PICNIC.—Sanford was a nephew of John McBroom, and as a boy attended some of these picnics. He writes:

The settlement of what was known as the Upper Platte from Denver to the canon and Bear Creek Valley from present Morrison to the river began in 1860, although some land claims were made during the summer of 1859. * * * For many years following this period, McBroom's Grove was popular for neighborhood picnics and finally by common consent became the official grounds for Fourth of July celebrations. Some dozen or fifteen well-proportioned cottonwoods from three to five feet in diameter, shaded an acre of grassy land. Bear Creek, then a much larger stream, was but a few rods away in its winding course to the river, a half-mile distant.

Of several celebrations of the Fourth, one seems to have left particular impressions on the mind of the writer. "Uncle John," as McBroom was affectionately called by every youngster for miles around, had spent days in preparation for the event by raking the ground, and putting up tables, benches, and other conveniences. About mid-forenoon of the great day, country people began to arrive in farm wagons. A few were provided with "spring seats," but more with cross boards for drivers and youngsters, and chairs secured with straps or ropes for the older folks.

McBroom welcomed each and all—directing where to "unhitch" and piloting the way for "women folks" to the tables where baskets and boxes of everything good to eat were piled up. By noon some specially invited guests had arrived "from town" and all were ready to feast. Then the motherly Cynthias and Mollies were busy distributing fried chicken, roast turkey, home-made bread and butter with other substantial. Later there were pies and cakes, jellies and jams of a half-dozen varieties of wild fruits, while in the nearby cabin, McBroom had a wash boiler brim full of hot coffee—"just his part of the treat"—as he expressed it.

It was a time and place for visiting among women friends whose ranch homes were far apart. If among the men there had been disputes over division fences or irrigating ditches, all were forgotten in a very atmosphere of good fellowship.

Dear old Father Dyer, the snowshoe preacher from the Tarryall Diggings, was there, the honor guest of all. We remember how every head was reverently bowed, as this pioneer soldier of the Cross invoked divine blessing on the assembly. Judge Ames read the Declaration of Independence and Judge H. P. Bennet followed with a speech of great eloquence on what the Fourth of July meant to the American people, and, pointing to the old flag suspended between two great trees, said: "And it will not be long until another star will be added to that field of blue—the Star of Colorado."

Of all that company of men and women, the writer does not know of one left among the living, and few remain of the boys and girls who that day romped over the bordering meadow or played old-fashioned games in the grove, that has long since disappeared.

CHAPTER IV.

The Settler and the Indian

There has been much misunderstanding as to the extent and nature of the Indian uprisings which held back development of Colorado during the latter part of the Civil War and for ten or twelve years following. This condition had much to do with discouraging land settlement. For years many ranches, even along the main lines of travel, were little less than armed camps. Whatever excuse might be offered for the Indians in their effort to hold back the advance of the white man, the history of that advance in Colorado did not differ from that which has always marked the path of conquest. It could not be a peaceable conquest, from the very nature of the goal involved and the character of the opposing races. A philosophical discussion of the racial issues is not in order in this book, for when the settlers began to take up farms and ranches in Colorado, and agriculture became necessary because of the demand for food by the people who were working the mines and developing the towns, there was a condition to face and the time for theorizing on the treatment of the Indians had gone by.

SWINDLING THE SAVAGES.—Nothing can be said in extenuation of the white trader who swindled the unlettered savage, or filled him with whiskey, nor is it a pretty picture to lift the curtain for a peep at the life of the squawman who became a member of the tribe for no high moral purpose and with no thought of bringing any of the benefits of civilization to the savage. These things were done and the responsibility rests, where it belongs, on the individuals who betrayed the race and belied the tenets of civilization. The unfortunate thing was—and always has been—that vengeance for these misdeeds was wreaked upon the generation that followed; upon innocent people who followed the advance of the first white men into the undeveloped territory of the savage. The blow fell heavily upon people who lived away from the protected areas of the town.*

There is need here for clearing up one chapter in the Indian warfare of Colorado pioneers that has left a stain on the memory of good men who

*In July, 1864, "it was estimated that there was not more than six weeks' supply of food in the territory. Mail communication with the East was cut off; mail bags containing letters, money drafts, land patents, newspapers and other miscellaneous matter were cut open and their contents scattered over the prairie. But one station was left standing on the Overland Mail Route for a distance of 120 miles."—History of Nevada, Colorado and Wyoming, H. H. Bancroft, (Vol. XXV.)

fought to protect their homes, as good men always have fought when homes and family were at stake. Without going into minute details of the Indian uprisings, which are better subjects for the political historian, this writer will concern himself only with the chief incidents of controversy, in the effort to do justice to a body of home defenders known as the Hundred Day men, who fought the battle of Sand Creek, which has been called a "massacre" with the Colorado soldiers as aggressors and Indians as victims.

THE SAND CREEK FIGHT.—The Sand Creek fight took place November 29, 1864, the spot being on Big Sandy, about ten miles north of the present town of Chivington, in Kiowa County. The soldiers engaged were the First Colorado Cavalry, re-inforced by troopers from Fort Lyon. Events which led up to the fight may be briefly summarized in the statement that the Plains Indians were on the warpath, that they had for months been making raids on wagon trains, stages, caravans, individual ranches; that they had murdered, robbed, burned and terrorized the entire region between the Rocky Mountains and central Kansas and Nebraska and successfully prevented all traffic.

Mail from the East for Denver and other Colorado settlements, was being sent to the Atlantic seaboard, thence by steamer to the Isthmus of Panama, across that Isthmus, and up the western Coast to San Francisco and over the mountains to Colorado by the back door. Supplies of food were running short, business was upset, life was unsafe and a state of war existed in Colorado. Appeals for troops to the central government were futile; the Civil war was in progress and no effective help was given, nor could it be expected under the circumstances. The West was left to work out its own salvation.

CHIVINGTON IN COMMAND.—In that extremity Denver took the initiative, backed up by the people of the territory and a field force was enlisted in hundred day service in an Indian campaign. This force was regularly enlisted upon authority from the Washington government. Col. J. M. Chivington took command. Chivington had a good record as a soldier, gained in the New Mexico campaign with the Union forces. He was a Methodist minister by profession and during the gold rush had become popular because of his ability as a leader. His war record in New Mexico gave him added prestige with the people of Colorado, who had confidence in his judgment, and who were aware that he knew the Indian character.

It was common knowledge in the settlements that half breeds and renegade white men were acting as spies and that any effort at a campaign against the Indians would be speedily tipped off to the enemy. It was true that these Indians now known to be in southeast Colorado and nominally under the protection of the government at Fort Lyon, had agreed to

cease their depredations. The pipe of peace had been smoked with the army officers and representatives of the territory at Denver. The people were aware, however, that these promises had not been kept and that raids had continued, while these redskins were drawing rations from the government. In other words, it was common knowledge in Colorado that the War department was feeding the savages, that these savages were supplied with arms and ammunition, and that under cover of peace agreement, they were treacherously continuing to prey upon settlers, by robbery and murder. Col. Chivington kept his plans secret, but started at once and in spite of heavy, late November snows and very cold weather, for the Indian country. Forced marching brought him to Fort Lyon, where he was joined by Major Anderson with 120 men and two pieces of field artillery, the officer welcoming the arrival of the First Colorado troopers and joining the expedition without delay.

A SUCCESSFUL ATTACK.—A successful attack occurred at dawn, November 29, Chivington's plan having worked, no word of his arrival having reached the village through spies. This village was not the unprotected abode of a peaceful band of Indians, but a camp, fortified and protected by a line of rifle pits. The attack was made and the Indians gave battle, the engagement lasting from 5 in the morning until 2 in the afternoon. From the records of the officers in command of these troops it is apparent that Chivington's attack was the only course that could have been followed by any soldier familiar with Indian warfare and with the history of the depredations, and acquainted with the Indian chiefs who were in command of the village.

PIONEERS MALIGNED BY HISTORIAN

Colorado school children have been taught that this was an unprovoked attack and the term "Sand Creek Massacre" has been incorporated in books that are still used in some of the schools. An example of how Colorado pioneers have been maligned by the historical writers who took as truth the politically colored reports of the fight, is here quoted from Eugene Parsons' "Guide Book to Colorado," the version being practically the same as that used by Parsons in "The Making of Colorado," written for school use:

"There were 130 lodges of Cheyennes and eight of Arapahoes. After a night march the soldiers surprised the Indian camp and attacked it at sunrise, on the morning of November 29, 1864. The first Colorado cavalry leading, they charged on the tepees, in which the red men were sleeping. They advanced with yells, firing at the startled braves, old men, squaws and children as they ran out singly or huddled in groups. The warriors scat-

tered and broke through gaps in the ranks. Although poorly armed and without their ponies, the Cheyennes put up a desperate fight. It was a sanguinary affray. Of the 500 or 600 people in the camp, it is estimated that from 150 to 300 were slain. The victors led away the captured ponies, covered with blankets, robes and other trophies. The Sand Creek massacre, as it is called, proved to be a costly mistake; it precipitated a bloody war, or rather a series of wars."

COLORADOANS CALLED MURDERERS.—There was rejoicing in Colorado when news of the rout of the Cheyennes reached the settlements, but a stunning surprise came from Washington, a short time later, where jealousy and political treachery had been at work and the people of Colorado were held up to the nation as accessories to the murder of innocent redskins. The first news of that sort reached Colorado in a dispatch from Washington dated December 20, 1864, and reading as follows:

"The affair at Fort Lyon, Colorado, in which Colonel Chivington destroyed a large Indian village and all its inhabitants is to be made the subject of congressional investigation. Letters received from high officials in Colorado say that the Indians were killed after surrendering and that a large proportion of them were women and children."

TREACHERY HAD POLITICAL SOURCE.—It has never been disclosed who inspired that dispatch, but the feeling in Colorado at the time was that there were two reasons for it. The first was, an effort to discredit Colorado troops for accomplishing what federal troops had not been able to do; the second, that any policy of Indian extermination would result eventually in ruining a good many political jobs in the West, some of them lined with rich graft out of Indian supplies and that, therefore, territorial interference with federal office holding must not be tolerated. To this might be added a feeling down east that the Indians had been constantly mistreated by the whites and that the settlers were foolish for seeking to make homes in the Indian country. Sympathy at Washington was for the Indians and the sting of that was distressingly felt in Colorado, because the Indian chieftains and their renegade half breed and white interpreters knew it.

HOW THE PEOPLE FELT.—How the people of Colorado felt on the subject is best expressed by the editorial utterances of the Rocky Mountain News, commenting on the Washington dispatch:

"Probably these scalps of white men, women and children—one of them fresh, not three days taken—found drying in their lodges were taken in a friendly, playful manner! Or possibly these Indian saddle blankets, trimmed with the scalps of white women and with braids and fringes of their hair, were kept simply as mementoes of their owners' high affection for the pale face. At any rate, these delicate and tasteful ornaments could

not have been taken from the heads of wives, sisters, or daughters of these 'high officials.' ”

The editorial further suggested that an investigation would be a good thing, “and let the world know who were making money by keeping those Indians under the sheltering protection of Fort Lyon; learn who was interested in systematically representing that the Indians were friendly and wanted peace.”

A SECRET COURT MARTIAL.—A secret court martial was held several months later; Chivington was censured and the First Colorado troopers were stigmatized for alleged unsoldierly conduct and officially disgraced by the record. The charge was openly made that the judge advocate of this court martial was a bitter personal and political enemy of Chivington. Major Anderson, who had seemingly been so willing to join the First Colorado in the campaign, had been mustered out of the service by the time of the court martial and in his testimony, now given as a private citizen, he went back on his written, official report of the battle and swore that he had taken the word of others for its substance.

STATES SETTLERS' SIDE.—The pioneer settlers' case against the Indian was well stated by William N. Byers in *The Rocky Mountain News* of July 24, 1865, under the caption “The Reasons”:

“Our pioneers came here in the summer and autumn of 1858. Early in the spring of 1859 the writer's lot was cast among them. * * * Our people were friendly to the Indians. The latter clustered around their cabins and tents, and we divided with them the little and precarious subsistence we were able to obtain for ourselves. This was not their hunting grounds, for the reason that the buffalo disappeared from this region more than twenty years ago. Scarce one has been seen within hundreds of miles of where Denver now stands (as the old Indian traders and the Indians themselves say), since 1842. They came to the settlements and hung about them to obtain a living, because it was easier than to go to the buffalo country and hunt for it. Occasionally they committed petty depredations which were overlooked. Until last year we do not think that a single Indian was ever killed or harmed by a citizen of Colorado. What was their return?”

MANY RAIDS AND MURDERS.—Then followed a detailed recital of raids and murders and after that came this summing up: “Since then the cup of horrors from Indian atrocities has been filled to overflowing. Well known citizens and immediate friends have fallen victims, men whom we were accustomed for years to meet daily upon our streets. Not only were they killed and scalped, but their bodies were mutilated in manner too horrible to mention. Over 150 men, women and children were brutally

murdered on the Platte River road between this city and the Missouri River last year and the number was increased by the massacres of January this year. Besides these, a number of women and children were taken prisoners, to be held in captivity compared with which death is an inestimable mercy. Add to the Platte outrages those of the Arkansas Valley, the North Platte, the road hence to Salt Lake and all along our frontier and the record of death is no insignificant one.

"Then count the millions of property destroyed, the homes desolated, the crops that went to waste last year, the constant terror and alarm and the inestimable damage to our country and its prospects and we think the footing will give good and sufficient reasons for the ultra views of Coloradoans at least, upon the Indian question. At any rate, our eastern friends must excuse us for entertaining them. They were beaten into us."

SEVERE REPRISALS FOLLOW.—The Sand Creek battle was followed by severe reprisals on the part of the Indians, the burning of Julesburg, the murder of many more settlers and passengers on wagon trains and stages occurring during the months when officials were quarreling over whether Chivington was right of wrong. Public sentiment finally resulted in an effective policy of dealing with Indians at war in a warlike way and then the lanes of traffic were reopened and life and property became safe on the Plains. In the mountains there was still trouble, which finally ended in the Meeker massacre in 1879.

Regardless of abstract views on the treatment of savage races by white invaders, the student of the daily life of the people of the Territory of Colorado, during the period of Indian uprisings, must perforce put the question to himself and give true answer: What would I have done under threat of the scalping knife and of hourly raids in which wife and children might be carried away into captivity worse than death, my cattle stampeded, my hay stacks and dwelling destroyed by fire?

AN UNBIASED INVESTIGATOR SPEAKS

Only in the West where the Indian problem was understood did Colorado's drastic policy find approval. Few voices from the outside were raised in defense of Chivington and the First Colorado. Among these one unbiased observer left a record written as a result of a visit to Colorado in 1871, during which he had opportunity to talk to some of the Hundred Day men. This observer was John H. Tice, a member of the State Board of Agriculture of Missouri, and author of "Over the Plains and On the Mountains," a descriptive volume devoted to the agricultural, industrial and mining opportunities in the state. Incidentally, Tice told something of the life of the people and discussed the "Sand Creek affair," about

which he had heard. It was quite evident that he came with a prejudice against Colorado people for their treatment of the Indians, but his contact with the people changed his views.

"Ask them what they know about Chivington or, as it is more generally known in the States, the Sand Creek massacre, and the answer is, 'I know all about it, for I was there.'"

Quoting from Tice's statement of what Colorado people said to him: That has been stigmatized as a massacre and we have been adjudged as murderers by those who know nothing of the facts about our wrongs, nor of the outrage that led to it. We did our duty then, if ever, to ourselves, to humanity, our country, to our God. You have been told in the States these were peaceable and friendly Indians. Peaceable and friendly, indeed. Why, there was not a mining camp in the mountains, nor a town on the plains where there were not daily brought the bodies of our friends and neighbors and sometimes the bodies of whole families, all gashed, scalped and chopped to pieces; murdered in cold blood by these fiends, and our homes pillaged, burnt and left desolate. We were impelled to take the remedy into our own hands, because the military officers were fond of the Quaker method of dealing with the savages and refused us protection, while they seemed always ready to accord it to our murderers. Why, these Indians had just made one of the most murderous and destructive forays into our settlements and were returning heavily laden with plunder to the friendly protection of Fort Lyon, when we undertook that long winter march and surprised them almost under the guns of the Fort, and—ah, well! they gave us no trouble after that. Now that you may know what kind of friendly Indians they were, we will tell you what we found and captured in their camp: sugar, coffee, drv goods, whole boxes of boots and shoes, clothing, greenbacks and bills of lading, showing that these were the plunder obtained from some (wagon) trains which had been captured and those in charge murdered a short time before on the Platte; but worse than that, we found female clothing, all bloody, a partially worn lady's shoe, which evidently had been filled with blood, and the scalps of white women and children dangling at their sides or decorating the shields of their braves!

The author goes into further detail on the Colorado side of the story and then follows his own comment:

"Now, I do not pretend to judge who was in the right and who in the wrong in that unhappy affair. But this much is evident, there are two sides to that, as well as to every other question. One side has told its story long ago, and if these men have been wronged and injustice done them, it is time that their version of the affair be heard. * * * Whatever may be the true explanation of the affair, of one thing I am certain, that malicious revenge and wanton cruelty is foreign to the nature of everyone (and there were a good many of them) that I met in the territory who participated in it. They are quiet, peaceable and inoffensive men, enjoying the universal confidence and respect of their neighbors."

Another voice, and an impressive one, raised in defense of Colorado, which the pro-Indian historians seem to have overlooked, was that of Schuyler Colfax, Vice-President of the United States, 1869 to 1873, who visited Colorado six months after the Sand Creek battle and made this statement as quoted in the Rocky Mountain News of June 6, 1865: "I am of the opinion that there are some five or six hundred friendly Indians in Colorado. They are those Chivington left on the field at Sand Creek."

CONDITIONS AGAIN SERIOUS.—Conditions again became serious in 1868 when news items from day to day carried word of outrages by the Indians. As usual the farmers and ranchmen were the chief sufferers, because of their isolation:

Aug. 23, 1868: Ranchman Langdon lost his house and several stacks of grain on Plum Creek by Indians. Settlers have gathered "in the fort" and sent an appeal to Denver for help. The body of Nicholas O'Cam, shot, stabbed and scalped, was brought to Denver "this morning" from Plum Creek, four miles above the Platte.

Aug. 25, 1868: "In the morning we look from our housetops and see the smoke ascending from burning ranches, hay and grain stacks."

Aug. 26, 1868: Indians on the war path between Denver and Wallace, Kansas. Bill Comstock, frontiersman and scout, shot dead at Black Kettle's camp. Other localities report murders of white men. Woman and boy slain on the Kiowa and bodies brought to Denver. Band of Indians sighted on Cherry Creek, 18 miles from Denver. Telegram sent to Army Headquarters at Washington, urging that troops be sent to quell the uprising.

Aug. 27: Further details given on murder of woman and boy. The woman had been outraged, butchered and scalped and the boy horribly mutilated. Denver stirred and government condemned for furnishing arms and ammunition to hostile Indians and turning a deaf ear to the appeals of settlers. Governor Hall issues proclamation, calling for volunteers.

Aug. 29: Rufus (Potato) Clark comes to town from Overland Park with twenty of his field men to enlist in Captain Downing's company and also furnishes three teams and wagons.

Sept. 11: Many families from Cherry Creek and up the Platte come to Denver for safety. Ranches left in charge of a home guard. Forts built and stocked with provisions. The Lilleys, Skeltons, Bowles, McBrooms and others came to Denver. Raids were reported from the Fountain Valley, Pueblo and along the Arkansas.

Sept. 29: Governor Hunt writes from the mountains, where he is on tour among the Utes: "The repeated failure of the general government to comply with its treaty obligations is constantly thrown in my face and I have no reply except to acknowledge the humiliating truth. They threw it in Speaker Colfax's face when in the Park, and they have occasion and always have had to throw it in the face of the government and all its agents."

Here again was proof that at least part of the blame for Indian troubles rested on the shoulders of the federal government and its agents in the territory. The Indians were unable to muster sufficient strength for a con-

certed attack during the fall of 1868. Stronger measures were put into effect by the government and the risk to the isolated settlers of the plains region became less with the passing years. The Indians ceased to be a menace only when sent away to distant reservations.

TROUBLE WITH THE UTES

While Indian warfare on the Eastern Slope ceased with the completion of the railroads and the establishment of transportation and commerce on a modern basis, Western Colorado continued in virtual possession of the Ute tribes for another decade. Though the Utes were technically on reservations, they did not respect geographic bounds and they had good precedent for wandering off the reservation in the fact that many a white squatter chose to invade their allotted territory. There was continual turmoil from 1870 to 1882 in Ute territory, as there had been in the previous twelve-year period on the Eastern Colorado plains. Matters reached a crisis late in the decade. In his message to the State Legislature in 1879 Governor Pitkin said:

PITKIN'S MESSAGE.—Along the western borders of the state and the Pacific lies a vast tract occupied by the tribe of Ute Indians as their reservation. It contains about 12 million acres and is nearly three times as large as the State of Massachusetts. It is watered by large streams and rivers and contains many rich valleys and a large number of fertile plains. The climate is milder than most localities of the same altitude on the Atlantic slope. Grasses grow there in great luxuriance and nearly every kind of grain and vegetables can be raised without difficulty. This tract contains nearly one-third of the arable land of Colorado, and no portion of the State is better adapted for agricultural and grazing purposes than many portions of this reservation. * * * The number of Indians who occupy this reservation is about three thousand. If the land was divided up between individual members of the tribe, it would give every man, woman and child a homestead of between three and four thousand acres. It has been claimed that the entire tribe have had in cultivation about fifty acres of land and from some personal knowledge of the subject, I believe that one able-bodied white settler would cultivate more land than the whole tribe of Utes. These Indians are fed by the government, are allowed ponies without number, and except when engaged in an occasional hunt, their most serious employment is horse racing. If this reservation could be extinguished and the land thrown open to settlers, it would furnish homes to thousands of people of the State who desire homes.

Governor Pitkin evidently knew the Utes, for they did like a good horse race, not only as riders, but they would wager all their possessions on some favorite runner. In fact, it was their love of horse racing that was one of the minor contributing causes of the Meeker massacre. The massacre was the overt act that forced the removal of the tribe to a Utah reservation and resulted in the opening of the Western Slope to white settlement.

MEEKER AND THE UTES.—Nathan C. Meeker was one of the organizers and leaders of the Union Colony at Greeley, editor of the Greeley Tribune, and a vigorous, opinionated and prolific writer. After retiring from editorial duties, he sought and received appointment as agent for the White River Utes. Meeker had his own ideas about dealing with Indians, be-

believing that if they could be taught to farm they would cease their nomadic life and become self-supporting citizens.

It was common knowledge in the West at the time that there was corruption and grafting in the Indian Service, that some of the agents were dishonest and that white traders, in collusion with the agents, took advantage of the savages at every opportunity. These conditions had increased the antagonism between the races. The Indians vented their anger on settlers innocent of any wrong, other than the fact that they were following the track of white settlement in the wilderness. People unfamiliar with the problem, especially newly arrived easterners, felt sympathetic toward the Indians, insisting that if they had been more fairly treated in the earlier years there would have been less trouble now. Meeker had positive ideas along that line and it was his desire to show what could be done with and for the Utes by humanitarian methods.

When he became agent in 1878, his first effort to civilize his charges was to teach them farming. Agriculture was his hobby and he realized the great possibilities of farming in the vast domain that had been allotted the Utes. The Indians not only were incapable of grasping the agricultural value of the empire set aside for them, but they thought it was their own property anyway. They had never recognized white control, but accepted the conditions because of the bounty that accompanied such control. They took the food, the cattle, the blankets and the firearms, but cared only for the land insofar as it gave them opportunity to hunt. Meeker's approach, with plows, harrows, mowers and other agricultural implements, was looked upon with disdain by the braves, who knew naught of the dignity of labor. Work was for squaws. To expect braves to farm was adding insult to injury.

PRESIDENT HAYES' PLEA FOR THE INDIANS.—In his course, Meeker was following the suggestions of President R. B. Hayes in his message to Congress, December 3, 1877, on Indian affairs, when he said:

Whatever may be said of their character and savage propensities, of the difficulties of introducing among them the habits of civilized life and the obstacles they have offered to the progress of settling in certain parts of the country, the Indians are certainly entitled to our sympathy and to a conscientious respect on our part for their claims upon our sense of justice. They were the aboriginal occupants of the land we now possess. They have been driven from place to place and the purchase money paid to them, in some cases for what they called their own, has still left them poor. Many, if not most, of our Indian wars have had their origin in broken promises and acts of injustice upon our part and the advance of the Indians in civilization has been slow, because the treatment they received did not permit it to be faster and more general.

President Hayes recommended that the Indians be supplied with agricultural implements and cattle on the reservations. In Colorado the settlers who had suffered from Indian depredations agreed with the President as

to the cause of Indian wars, but they knew also that the remedy was not being applied at headquarters in Washington, although the Indian affairs committee and the Interior Department were under fire on charges of graft and incompetence at that time.

GEN. SHERMAN EXPECTED TROUBLE.—Three months later General W. T. Sherman, in his report to the Secretary of War (March, 1878), said: "I have personally seen the Utes and realize that the Interior Department will experience difficulty in obtaining their consent to a further reduction of their limits. Though a small tribe, they conceive that the world is not large enough for them alone. Nevertheless, the restless white emigrants in search of gold, silver and land, have penetrated their mountain regions and cannot be stopped."

UTES WERE SWINDLED.—Meeker's predecessor at the White River Agency had been charged with using government teams to freight for private parties and neglecting the transfer of stores intended for the Utes, which had been shipped to Rawlins, Wyoming. The Indians knew the goods were there, but they could not get them. The agent also was accused of having sold Indian stores for his own profit.

The Rocky Mountain News of March 20, 1878, said: "One cannot much blame them for trying to get even with the white thieves, who robbed them in the name of the United States government, and it will take them a long time to forget their treatment during the last year, even if better practices prevail hereafter. One-half our Indian troubles would be averted if the Indians had confidence in their agents."

THEY REFUSED TO FARM.—These were the conditions confronting Meeker when he took charge of the White River Agency. His course, therefore, in attempting to persuade the Utes to work, merely caused the smouldering fires to blaze up. Meeker's charges sullenly refused to touch an implement and when the agent started to plow up their race course, the storm broke. Complaint already had been made by the Indians to Governor Pitkin that Meeker was teaching school and urging them to plow. They did not make the usual complaints of grafting, but insisted on Meeker's removal because they were unalterably opposed to work. They became openly threatening during the summer and Meeker, becoming alarmed, asked the Governor for help and also appealed to Washington for protection. Arms and ammunition were being sold to the Utes by a neighboring white Indian trader. The mail route was closed. Johnson, a Ute chief, made a brutal attack upon Agent Meeker and a short time later one of the employes of the Agency was shot and injured while plowing.

THORNBURG IS AMBUSHED.—The War Department finally ordered Major T. T. Thornburg, with his command of 160 cavalrymen, to march

to the Agency and afford protection. Within twenty-five miles of the Agency this command was ambushed by the Utes, fifteen men being killed and thirty-five wounded. Major Thornburg was among the first to fall. This attack was made September 29, 1879, and at the same time a small party of Utes attacked the Agency, killing Meeker* and nine other men, while Mrs. Meeker, her daughter Josephine, Mrs. Price, wife of an employee, and two children were carried away into captivity. The Agency buildings were pillaged and burned. In the meantime Thornburg's command stood a siege of six days until General Merritt arrived with reinforcements, the Indians disappearing on the arrival of a superior force.

On October 21, the captive women and children were turned over to Army officers, on the intercession of Chief Ouray, of the Southern Utes, who had always proved himself a friend of the white man. It was just two years later, on September 4, 1881, that the transfer of the Utes to the Uintah Reservation in Utah was completed and the reservation thrown open to white settlement.

END OF INDIAN WARFARE.—This marked the end of Indian warfare in Colorado and opened to development the largest remaining territory suitable for agriculture, a region proving especially favorable for fruit growing, in which, in one generation of white occupation, agricultural production was measured in terms of tens of millions of dollars a year. It is this same region, now so productive from the soil, that promises, in the not distant future, to produce fuel oil from mountains of shale bordering the rich fruit valleys, in greater quantity than all the oil that has yet been produced from all the petroleum wells on this continent.

MEEKER AND OURAY.—Before leaving the story of the opening of the Western Slope it is fitting to make brief reference to two figures that left an impression on the State's agricultural history. One was white, the other of Indian blood. One had what we may term all the cultural advantages of white civilization; the other was a child of Nature, untutored but endowed by the Great Spirit with qualities of diplomacy that were somewhat lacking in the civilized American who brought upon himself the wrath of the savages. These historic figures are Meeker and Ouray.

Ill fate followed Meeker throughout his career in Colorado. "Probably no citizen of Colorado since early times ever deserved more at the hands of the people, and certainly no prominent citizen ever received less of honor or profit, for, as far as results to himself and his fortune were concerned, from his entrance to the territory in 1870, to his exit from life at White River, mortification and disaster sat on his right hand and on

*"The gray-headed philanthropist was dragged about the Agency grounds by a log chain about his neck, and with a barrel stave driven down his throat."—Bancroft's Works, Vol. XXV, Nevada, Colorado and Wyoming, p. 475.

his left, accompanied him seemingly at all times and pursued him, if such a thing be possible, after he was dead."

Thus wrote "Colonist" in the Denver Tribune, under the caption, "Meeker's Monument," (August 3, 1880). Reference was made in this communication to a statement in the New York Tribune, which newspaper had backed the colony. Horace Greeley had passed away and those in charge seemed to have forgotten that N. C. Meeker was once the agricultural editor of the New York Tribune. At any rate, after the massacre the Tribune made this comment: "Much as we regret the murdered Meeker, we cannot forget that he was himself in a great measure responsible for his death by appropriating the Indian lands to his own use."

HONEST AND PLAIN SPOKEN.—Nothing could have been farther from the truth, for Meeker was honest to the core. "Colonist" in his eulogy of Meeker, said: "He was blunt of speech, what is called plain spoken, and a little inclined to be irritable at times; and above all he was independent in thought, tongue and pen, and whatever he honestly thought he spoke or wrote, and little cared who it might offend."

It was this lack of tact that stood in the way of financial success for Meeker at Greeley, where a rival newspaper had been established, dividing the patronage with the Tribune, cheering his enemies and lessening his chances for an income. He sought public office mainly because he was in need. He was glad of the chance to serve as Indian Agent, because on treatment of the Indians he had ideas of his own which he tried to put into effect, with what tragic result we have already related.

And what was the monument of which his friend "Colonist" wrote? The town which he had founded had its Main street, and the town council decided to honor the memory of its founder by re-naming Main Street Meeker Avenue! Whatever good intention there might have been at that time was not carried out; and Greeley has no Meeker Avenue.

WAS A "WHITE" INDIAN.—There is no record that Ouray and Meeker ever met, but after the massacre it was Ouray's influence that led to the rescue of the captured women. It was Ouray upon whom the people of Colorado had depended to keep his Utes from the warpath and they of the Southern tribe obeyed their leader. That he was the first to teach them to farm in the white man's way is apparent from an official communication which Ouray made to Governor Elbert in 1873, at a time when there was friction between the Southern Utes and the prospectors and settlers who were crowding in upon the Ute country during the gold rush into the San Juan. This letter is characteristic of the man. He dictated it to Felix Brunot, a Special Commissioner who had been investigating Indian troubles. It follows:

Los Pinos Agency, September 13, 1873.

Mr. Brunot, Dear Sir: You have been to see us, and we have had a good time. We want you should tell Governor Elbert, and the people in the territory, that we are well pleased and perfectly satisfied with everything that has been done. Perhaps some of the people will not like it because we did not wish to sell some of our valleys and farming land. We think we had good reasons for not doing so. We expect to occupy it ourselves before long for farming and stock raising. About eighty of our tribe are raising corn and wheat now, and we know not how soon we shall have to depend on ourselves for our bread. We do not want to sell our valley and farming land for another reason. We know if we should the whites would go on it right off, build their cabins, drive in their stock, which would of course stray on our lands, and then the whites would crowd upon us till there would be trouble. We have many friends among the people in this territory, and want to live at peace and on good terms with them, and we feel it would be better for all parties for a mountain range to be between us.

We are perfectly willing to sell our mountain land, and hope the miners will find heaps of gold and silver, and we have no wish to molest them or make them any trouble. We do not want they should go down into our valleys, however, and kill or scare away our game.

We expect there will be much talk among the people, and in the papers, about what we have done, and we hope you will let the people know how we feel about it.

Truly your friend,

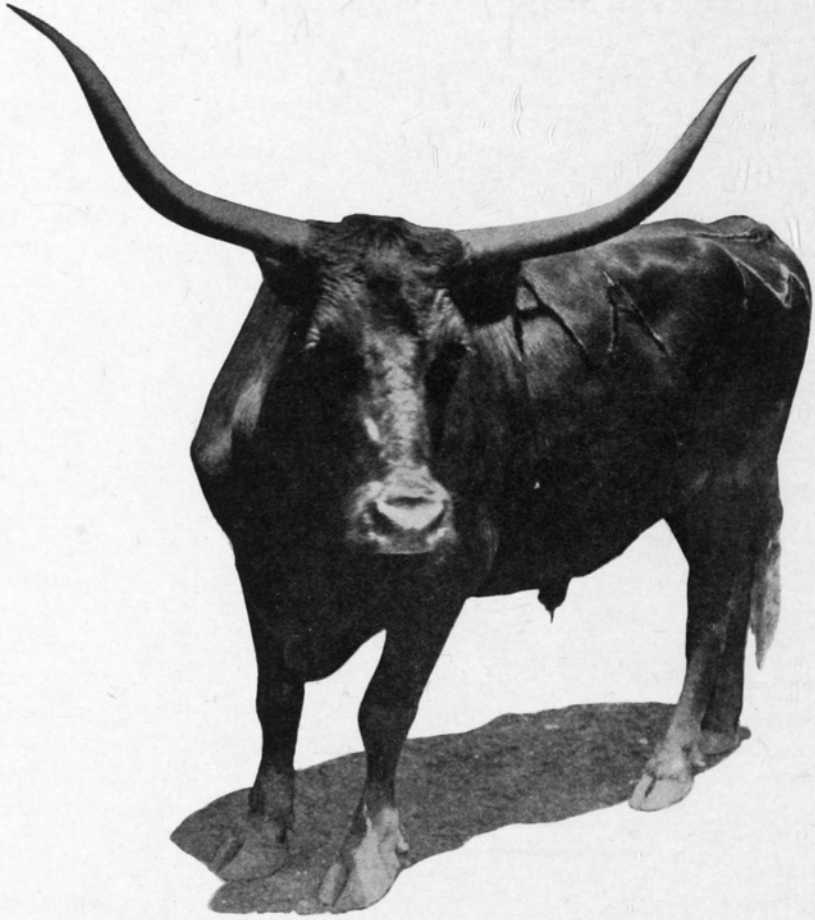
OURAY.

WHAT MIGHT HAVE BEEN.—A glance at the somewhat fragmentary facts about Ouray's dealings with the settlers and the government raises a question as to what might have been the trend of history had white civilization been less selfishly imposed upon the savage West. Bitter enmity between the races existed long before the beginning of Colorado settlement, and while it seems easier to look back and deplore errors than it is to anticipate and avoid them, such heroic figures as that of Ouray, nevertheless, humiliate our sense of white superiority, and shame us into acknowledgment of wrongs cruelly inflicted upon a race whose chief fault, originally, was ignorance. Were there many like Ouray who might have listened to reason rather than rifles?

And what of Meeker's mistake in seeking to reform the tribe of Northern Utes by edict, just as he had sought to guide the Union Colonists through editorial suggestion? One wonders why Meeker did not go to Ouray for advice before he took up his duties on the White River Agency. Other white men went to the red chief and he never proved false in word or act.

The remnant of Ouray's people live on a reservation in the extreme southwest corner of Colorado. Ostensibly they are farmers; they possess land and herds and flocks. Their youth are taught in a government school. Their annuities from a beneficent government come regularly now; there is no fraud, no lying Indian agent of the old carpet-bag days. Everything is splendidly supervised and tourists motoring through are a source of profit for basketry, beads and blankets.

Those of the northern branch, among whom were the slayers of Meeker, live under the same close supervision on a reservation in Utah. So the conquest of the old order has been completed and there is peace. The stake was, as always, the land upon possession of which depends all the commerce of civilization; therefore, also, the art and culture.



Texas Longhorn Steer. (Photo courtesy The Dallas News.) This breed is practically extinct in North America, only a few of these old Spanish cattle being found now in the interior of Mexico.

CHAPTER V

The Range Livestock Industry

Sheep and cattle were already on the grass of the southwest ranges when gold was discovered in the Pike's Peak Region and the new commonwealth of Colorado was born. Mexican settlers south of the Arkansas and on the upper Rio Grande, as well as a few Americans who kept stage stations on the Santa Fe Trail, or who had been attached to the small garrisons at Fort Bent and other outposts that guarded the path of commerce between the States and Mexico, kept cattle and sheep. Cattle were trailed across the plains in 1846, when the Army of the West on the march to New Mexico brought its live beef in a drove that was pastured on the virgin prairie grass. The official record of the march by Lieut. W. H. Emory contains this statement: "Provisions were conveyed in wagons and beef cattle driven along for use of the men. These animals subsisted entirely on grazing."*

SUSTAINED WILD LIFE.—Grass stood rank and lush in creek and river bottoms and covered the uplands with a curly carpet of green or brown, according to the season of the year. That buffalo, deer, antelope and elk by the million had found sustenance on grass had impressed the early Spanish explorers who pastured their pack mules on it. So it was evident also to the American exploring expeditions of the early nineteenth century, to the trappers, the Mormon pilgrims, the California-Oregon migration and the traders who traversed the Santa Fe trail. And along the Rio Grande and other streams in New Mexico and Texas, with Spanish settlers and later the Americans, grazing was an established industry long prior to the settlement of Colorado.

To the aboriginal inhabitants, the nomadic Indians, grass, like the water from heaven, was taken as a matter of course. The wild animals which the Indians hunted for meat lived on grass; it sustained their ponies after the Spaniards had become, unwittingly, the means of introducing equine life to the New World. These horses lived and thrived on grass, as did the cattle which came to South-western America from the same source.

INDIANS ON MEAT DIET.—There is no record of universal famine among the Plains Indians, whatever hardships they may have endured

*"The Old Santa Fe Trail."—Inman.

through drouth or extreme cold. Everything favors the conclusion that the physical vigor of these tribes was due mainly to a diet of meat, which did not fail them until the white man invaded their haunts. While there was no consciousness among these savage tribes of their debt to grass, it sustained them and they accepted it as children do a bountiful table in a happy home. It was a foregone conclusion that the white man, in his civilized way, would turn to account this natural resource; that he did it greedily is evidence that the progress of civilization ran true to precedent.

Wagon trains that crossed the plains were drawn by oxen. These work animals were sustained by the native grasses from the time they left the Missouri River to arrival at the foothills. Emigrants brought milk cows, and wayside pasture maintained the milk flow. While the gradual disappearance of tree growth on the westward course gave the country a desert aspect, grass, nevertheless, relieved the fears of the pioneers who saw in the ample turf a sign that the Great American Desert would sometime become a rich pastoral empire. Even in the heat and drouth of midsummer, when the plains assumed the sere and yellow tint of untimely autumn, these travellers to the new gold country saw how eagerly the withered vegetation was devoured by their cattle and counted it a sign of the favor of a newly discovered land of plenty. Nor was that the only evidence.

WAGON BOSSES MADE DISCOVERY.—While these first impressions were rather indefinite, the practical discovery of the grazing value of the new country was made by the wagon train bosses in that first autumn of 1858, when they were facing a winter with many oxen and no hay stacks in sight around which to tether them during the months of idleness. Among these resourceful freighters was Colonel Jack Henderson, who reached the new settlement of Auraria at the junction of Cherry Creek and the Platte River late in 1858, with a train of supplies from Lawrence, Kansas. Henderson's title had been earned in the border troubles of eastern Kansas. His name was given to an island in the Platte, where he established the first public corral or cattle yard. There were no accommodations for oxen in that first fall, so Henderson turned his work stock out on the grass, as did others. Early in the spring of 1859 he rode out into the wilderness eastward toward Bijou Creek to hunt buffalo. On the way he saw some oxen grazing and on riding close, recognized his own brand on them. *They

*An advertisement appearing in The Rocky Mountain News in various issues during December, 1859, relates to Col. Jack Henderson's establishment of facilities for pasturing and feeding stock over winter. It read as follows: Henderson's Island—This celebrated ranch is now open for the reception of all kinds of stock to winter. Being the largest ranch near the cities of Auraria and Denver, containing 320 acres, and being well timbered and watered, and having on it a splendid picket corral, with stabling for two hundred head of horses or mules, it offers extra inducements to persons having stock to winter. Cattle, horses and mules taken by month or for winter. This season's grass still uncut and 80 tons of hay in stack.—John D. Henderson, Proprietor.

were in fine condition, having grown fat during the winter on the native pasture. Henderson rounded up his oxen and drove them back to town, pleased with the discovery and announcing it to the people of the settlement.

Others had a similar experience, each in turn making his own discovery of the practicability of winter grazing along the base of the Rocky Mountains. Among those who left a clear record of these experiences were Williams and Blake, who came as freighters, taking up an abandoned adobe corral, the ruin of old Fort Lupton and turning out their oxen in the early winter of 1858. David Ewing, who settled at Ft. Lupton, said in later years that these were the first domestic cattle to graze along the Platte west of Kearney. Irvin and Jackman, after freighting in their last load in 1859, had 400 footsore oxen which they trailed out to a sheltered spot on the Bijou, near what is now Deer Trail, and on rounding them up in the spring, found two-thirds of them in better condition than when they were turned out in the fall.

Daniel Holden, among the first to sell milk and butter in Denver, settled on Cherry Creek in 1860, having driven in a small herd of dairy cattle. Like many others he saw the value of the standing grass for hay and selected a good spot for cutting, some distance east of Denver along the upper Bijou. He cut and stacked hay and turned his cattle out, thinking they would remain near the stacks. Instead they wandered off into a glade that offered better picking, though the grass looked sere and yellow. Holden saw how they fattened on the natural pastures and he decided, then and there, to devote himself rather to beef raising than dairying, because it involved less labor and returned as sure a profit. Holden settled on the spot and later became a member of the territorial legislature. Incidentally, he was among the first to raise hogs and he marketed some pork, besides producing sufficient for home use.

The several authentic incidents thus recorded are assurance that the discovery of the value of the new country for grazing was made quickly and by many of the arriving wagon bosses and emigrants. They took advantage of it commercially to get rid of their footsore and broken down oxen to the butcher after a season on grass.

CHARACTER OF WESTERN GRASSES.—To the practiced eye of the grazier it was clear that these western grasses differed in character from the varieties to which he had been accustomed in the States. In winter they were not broken down by frost like the moisture-laden grasses of the East, but they stood straight-stemmed, erect and dry—some kinds were even fluffy—and although withered and yellow, retained their nutriment, as does cured hay in the stack. It was a discovery confirmed by later experience that

grasses cured by Nature on the ground not only maintained stock in good flesh, but that animals actually increased in weight during the winter. At first cattlemen believed the grasses possessed some special, valuable properties, but later scientific interpretations attributed the nutritive qualities to the effects of the dry climate in curing the grasses on the ground.*

Game was plentiful in the new settlement, nevertheless the American's taste for beef had to be satisfied. Ten cents a pound at retail was the prevailing price in Denver during the first years, but in the mining camps beef brought prices that fluctuated with the supply of broken-down oxen, as well as with the quantity of gold dust being panned.

FIRST FAT CATTLE SOLD.—Fat cattle were listed as a market commodity in Denver as early as 1862, when L. Butterick, a butcher, bought seven head of beeves at five and a half cents a pound, live weight, paying \$525 for the lot.

"No fatter cattle can ordinarily be found on the markets of the eastern states, notwithstanding the fact that the latter are supplied with stall-fed beeves, while here they are driven off the plains of the Great American Desert where they feed on grass of their own finding the year round," was the comment of the Rocky Mountain News in recording this first beef cattle marketing transaction.

BEGINNING OF BEEF PRODUCTION

Here was proof that, within four years, grass-fed beef production had assumed the character of a distinct industry. That it was started with discarded oxen was a makeshift that illustrated the adaptability of the pioneers to their new environment. That oxen were not the sole source of beef is shown by the story of Samuel Hartsel, a pioneer of South Park, who was in the cattle business fifty years. He was one of the first to bring in purebred cattle. Hartsel came to Colorado in 1860, going to the Tarryall diggings. He found no gold, so he went to herding oxen. Sore-footed and sore-necked animals were being sold for beef by the freighters there as elsewhere, and Hartsel began to buy these discarded cattle, putting them

*There are two common Grama grasses on our range. One is known as the Blue grama grass whose scientific name is *Bouteloua gracilis*. Another is the Hairy grama grass, *Bouteloua hirsuta*. These are both quite common through the eastern part of Colorado on what are known as the short grass plains. Buffalo grass is always distinguishable. Its scientific name is *Bulbilis dactyloides*. Bluestem, sometimes spoken of as Colorado bluestem, is *Agropyron smithii*. Other species of *Agropyron* are sometimes confused with this. The grass has a very bluish bloom on the leaves and is quite striking in its color. Bunch grass is more obscure. In the early days, bunch grass meant either *Andropogon frucatus* or *Andropogon scoparius*. Of late years, following over-grazing, other bunch grasses have come in. These are not so tall, being only about a foot high. They grow in tufts having a silvery or purplish color, the genus is *Aristida*, sometimes called Poverty grass or three-awn grass. What the stockmen referred to in the early days were the former two species.—L. W. Durrell, Botanist, Colorado Agricultural College.

out on grass for fattening. He paid \$10 to \$20 a head for them and sold them fat at \$90 to \$100. His first important sale was in the spring of 1863 to a butcher at Hamilton, a mining camp that long ago disappeared from the map. He got \$1,000 for ten animals.

HARTSEL STARTS A HERD.—In the spring of 1861, Hartsel bought out two men from Iowa, Duke Green and Ed Shook, who came across the plains with twenty high-grade and two or three registered Shorthorn cows. In 1864 Hartsel went back to Missouri, where he bought 148 cows and several bulls of the Shorthorn breed, all eligible to registry, from Tom Gordon, a Clay County breeder, whose grandson, Gordon Jones, in later years was prominent in the banking business and livestock industry at Denver. It took Hartsel two years to drive these cattle to Colorado, the caravan with which he traveled being held up by Indian warfare along the Santa Fe Trail.

TEXAS IMPORTATIONS NOT WELCOME

During the first two years of settlement, Texas drovers began to come in from the Southeast, their herds subsisting on the grass while they peddled cattle to the new settlements along the Fountain and over the Arkansas Divide to the Platte and Cherry Creek. In 1861 notice was taken of this trade by the Territorial Legislature in the passage of an act forbidding non-residents to import any cattle, sheep, goats, mules and hogs into the counties of Huerfano, Pueblo, Fremont, Jefferson, Boulder and Costilla for "grazing, herding or feeding same, or quartering them upon the public domain, or upon the lands of any person or persons." Colorado land owners were exempted, as were those who were lawfully driving through or selling stock, the object of the law being to prevent permanent occupation of grazing areas by non-residents.

Again in 1867 legislation was resorted to, this time in drastic fashion, to stop the determined northward movement which the Texans had started. This law read as follows:

It shall not be lawful for any person or persons to import into the Territory of Colorado any bull, cow, ox, steer or cattle of whatever description known as "Texas cattle" for the purpose of small stock raising, growing, herding, or feeding, or for any purpose whatever.

TAKE LAW IN OWN HANDS.—The only attempt made to enforce the law forbidding importation of Texas cattle was in 1869, by a group of Douglas County ranchmen, who had what were called American cattle.* Losses from a mysterious fever, which the Texas trail herds were spreading, had mounted to over a thousand in that county during 1868 and,

*"American cattle" was the term applied to cattle brought from the East over the Plains, in contradistinction to the Spanish type, which came from Texas.

with the appearance of the first trail herd in 1869, an attack was made at night. Shots were fired to stampede the herd, four head being killed and thirty wounded, while the balance of the cattle scattered. The drover was arrested and fined \$50. He then rounded up his remaining animals and drove on northward. This incident led to serious controversy between owners of well-bred American cattle and those who were attracted by the chance to make money in handling Texas cattle, with the result of repeal of the law by the Territorial Legislature of 1870.

CIVIL WAR RESTRICTS DEVELOPMENT

There was little encouragement for any new industry while the fate of the Union hung in the balance, and beef production during the Civil War years was exclusively for supplying local demands. Sheep had a slight foothold in southern Colorado among the early Mexican settlers, and there was considerable traffic in wool over the Santa Fe Trail, but this originated principally in New Mexico. Not until the railroads came, with quick transportation for wool, did sheep-raising appeal to Colorado ranchmen. Very few cattle herds were found on the open plains east of Kiowa Creek until after 1866. During the war Indians took advantage of disturbed conditions and the lack of military forces in the West to blockade the lanes of wagon and stage traffic, as well as to harass, rob and murder settlers.

War contracts had been of trifling benefit to the Colorado livestock producer. Beef was being furnished to a few army posts, horses were bought in Colorado from those who rounded up the wild broncos, and driven east to supply the Union army. Good prices were paid locally for work oxen, which were selling at \$150 to \$200 a yoke. Mules were scarce but greatly desired for work in the mining camps and for stage transportation, prices running \$400 to \$800 a span. These prices were quoted in 1864 when mining was fairly prosperous, but stagnation, due to Indian depredations, held back development of the plains.

Oxen were the principal draft animals, though the use of horses and mules was increasing as rapidly as a supply could be obtained. Quicker transportation was the demand of the hour. Railroads were projected but not yet built beyond the Missouri River.

SHIPS OF THE DESERT.—Camels, the Oriental "ships of the desert," were being exploited for transport service. One day in June, 1866, there lumbered into Denver a camel-drawn wagon which had come from the Pacific Coast with Omaha as its destination. L. S. Musgrave drove the outfit. He housed his beasts in a tent and gave an exhibition of the carrying capacity of the camels for the edification of the curious. A thousand-

pound load and forty miles a day without a stop for water was the claim made for the "ships of the desert." It was planned to organize an overland mail and express service with camels, operating between Omaha and Sacramento. Nothing came of the effort to popularize camel transport, because the railroads were coming and people were looking forward to a change in conditions that was to revolutionize the life of the new community.

FIRST CATTLE SHOW.—A record of the second annual fair of the Colorado Agricultural Society, held at Denver, October, 1867, indicates that Colorado livestock producers were building on better blood than the Spanish breeding that prevailed in Texas. P. D. Miller of Colorado City drove to Denver for the fair with 14 head of Durham cattle, headed by a bull sired in Kentucky, weighing about 2,000 pounds and valued at \$300. Others who showed cattle of quality, mostly of the Durham breed, were Wilson & McLaughlin, G. J. Ross, Fred Buckman, I. H. Bachelor, J. W. Clure, C. Lerchen, L. K. Perrin, J. T. Yunker, J. W. Cline, A. H. Smith & Brother, G. F. Gallamore, A. H. Jacobs, A. J. Pennock, A. Baker, Thos. M. Sloan, L. H. Dickson and Peter Magnes. Fifty head of horses and cattle were exhibited, and there were also pigs and chickens. At the third annual fair, October 6, 1868, very few cattle were shown, as the Indians were on the warpath and it was not safe to go on the trail with a herd or to leave the ranch unprotected.

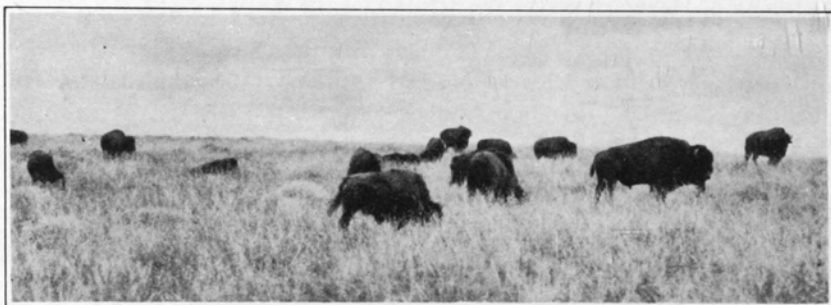
RUTHLESS SLAUGHTER OF BUFFALO

As if in preparation for the floodtide of Longhorns, was the ruthless slaughter of buffalo that reached its maximum in the early seventies. By the time the range was crowded with cattle the last of the shaggy-maned bison had vanished. The white man found the western prairies black with bison. An age of Indian occupation had not decreased the vast hordes of meat animals that drew their sustenance from the nutritious grasses of the plains. The white man came to subdue the country and within fifteen years where millions of buffalo had roamed, remained only scattered remnants of a vanishing animal race.

Speculation as to what might have happened in the range livestock industry had the buffalo been allowed to remain and become domesticated is idle. It was taken for granted that there was no room on the range for both wild and domesticated cattle. Be that as it may, history has no kind words for the buffalo skinner—the huntsman who shot only for the hide that became the buffalo robe of commerce. Col. R. J. Dodge of the United States Army is authority for the statement that the destruction of buffalo

during 1872, 1873 and 1874 was upwards of four millions, three-fourths of the kill being for the hides alone.

Authentic accounts in Government reports tell of almost unbroken masses of bison moving over the plains in herds, sometimes one hundred miles in extent. Views from hilltops with field glasses were had of grazing bison in continuous mass for ten to twenty miles in all directions. Four or five years later the observer saw "a continuous line of putrescent carcasses, so that the air was rendered pestilential and offensive to the last degree."*



Buffalo on Linn Sherwin Ranch near Sterling

KILLED 133 IN ONE DAY.—Colonel Dodge reported the greatest number of buffalo killed from one stand by one man to be 133, though the hunters told him 80 was a fair day's work, as that was about all that a crew of three could skin a day. The animals moved in such dense masses that a hunter in a sheltered spot needed not to change his position, but could pick his quarry and get a hit with nearly every shot.

As if to emphasize the enormity of the crime of extermination, there descended from the skies vast swarms of destroying locusts to strip the land of crops, visiting hunger upon settlers who had had no part in the slaughter of buffalo, but who felt it doubly now, as they had lost their winter's meat supply at a time when grain and vegetables were ruined by the insect plague. The year 1873 was one of the memorable "grasshopper" years, and settlers along the Republican River in western Kansas were starving. They appealed to the Government for aid. A detachment of troops was ordered to the region to kill buffalo and supply the settlers with meat. The skinners had been over the ground, and when the soldiers came there were no buffalo left alive on that range. Evidence of wanton killing was visible in long lines of skeletons shimmering in the sun, marking the death trail of the bison.

*Hayden Geological Report 1875: "Hunters had formed a line of camps along the banks of the river and had shot down the buffalo night and morning as they came to drink."

INDIANS ATE THE TONGUE.—Only choice morsels were taken by the Indian hunter while buffalo were plentiful, the practice being to cut out the tongue, take the hide and leave the carcass to rot, except when laying in a winter's supply of meat, when better use was made of the flesh. The hump was relished also and was considered by the Indians to be next in tenderness and flavor to the tongue. Among white settlers there arose differences of opinion about the meat of the buffalo, some declaring that it was superior to the meat of domestic cattle, while others looked on it with disfavor. These differences were due, usually, to the varying age of the animals slaughtered and eaten, the flesh of a young cow or bull being hardly distinguishable from grassfed beef.

Buffalo meat was commonly served on hotel tables in towns along the newly-built railroads in eastern Colorado. It was a common article of diet in the pioneer mining camps, and for a time figured considerably in the commerce of the new country. Early records of the railroads tell the extent of shipments as late as 1874, when the Kansas Pacific handled 2,160,000 pounds of buffalo meat, the Santa Fe 631,800 pounds of meat. The other side of the story comes in the report of the Santa Fe for the same year, which shows 1,314,300 pounds of hides and 6,914,000 pounds of bones shipped east.

COLLECTED BUFFALO BONES.—The hungry settler on the western prairies, deprived of crops by a visitation of grasshoppers, robbed of wild meat by the buffalo skinners, got a miserable pittance for picking up the bleaching bones and hauling them to the railroad, whence they were shipped to St. Louis and Pittsburg for use in comb and button factories, or for making fertilizer. Inman in "The Old Santa Fe Trail" says that in the thirteen years from 1868 to 1881, in Kansas alone, \$2,500,000 was paid out for buffalo bones, this sum indicating skeletons of thirty-one million animals. "These figures may appear preposterous to readers not familiar with the Great Plains a third of a century ago, but to those who have seen the prairie black from horizon to horizon with the shaggy monsters, they are not so."

It was the coming of the railroads that hastened destruction of the buffalo, for they brought an influx of new settlers and provided facilities for shipping buffalo beef and hides. While the extent of the slaughter was not apparent until about 1870, as early as 1864 people were appealing to the government for action to halt the annihilation of the noble animal. Hiram P. Bennett, who represented the Territory of Colorado in the United States Congress, introduced a resolution instructing the Committee on Territories to consider the propriety of passing a law for protection of the buffalo. At that time along the main route of overland travel west of

Fort Kearney, on the Platte, herds migrating northward in spring and back south in fall, following the grass, had become mere squads and small droves. And these herds once blackened the scene as far as the eye could reach! Bennett was given scant attention by Congress, the Committee on Territories deciding that a law protecting buffalo would be unenforceable. So the slaughter went on, intensified by the construction of the Pacific railroad and again by completion of the Kansas Pacific and the Santa Fe farther south. Lines of steel bisecting the grazing grounds hemmed in the herds, the shriek of the locomotive scattered them, and they were finally chased to their death by a blood letting for profit for which there is no parallel in the history of the animal kingdom.

TOOK THE INDIANS' MEAT.—Though not clearly realized then, it became a settled conviction later that the slaughter of the buffalo was one of the principal irritants that led Indians on the warpath, and many a family of settlers, innocent of harm toward the redskins and taking no part in the extermination of the buffalo, were wiped out in revenge for wanton destruction of the Indians' meat supply. This meat, too, had sustained white settlers on the plains before cattle became plentiful. The most acute loss to the settler was that of the fuel—the buffalo chips or dried dung, which was the only fuel available on the treeless plains before the days of the railroad and the coal mine.

Disappearance of the buffalo alone would have been sufficient to bring to an end the nomadic existence of the Plains Indians.

“The buffalo supplies them with almost all the necessaries of life; with habitations, food, clothing, and fuel; with strings for their bows; with thread, cordage and trail ropes for their horses, with coverings for their saddles, with vessels to hold water, with boats to cross streams, with glue and with means of purchasing all they desired from the traders. When the buffalo are extinct, they, too, must dwindle away.”

Thus wrote Francis Parkman in 1846 (*The Oregon Trail*). Thirty years later what he foresaw had come to pass. The way had been cleared for a floodtide of Texas cattle that overran the buffalo range.

PLIGHT OF THE TEXAS DROVER

While the discovery of Colorado's natural grazing resources would have led, eventually, to large scale beef production, development though on a sounder economic basis and with far better quality, would have been much slower had not the misfortune of war wrecked the range industry in Texas. So interwoven are the threads that bind Texas and Colorado that we must go to the Lone Star State for beginnings. The Civil War had put an end to traffic in Texas cattle over trails to St. Louis and other markets along

the Mississippi. Shipping from Texas ports to New Orleans for the Confederate Army ceased after the capture of New Orleans by the Union forces in 1862. No other outlets were available. Stagnation came over an already ill-managed, haphazard industry. Cattle increased to almost incredible numbers until the plains of Texas were literally over-run.

With this great surplus securely locked in the South behind the barrier of war, there was an acute shortage of beef in northern markets, where the demand for the army and for civilian use could not be supplied. Ordinary steaks and roasts were selling in the cities for 40 cents a pound and the workingman's portion was boiled beef once a week. With virtually a beef famine in the Upper Mississippi Valley, Texas and Indian Territory counted four million head of cattle, without an open road to market at the close of the Civil War. Without railroads, deprived of Gulf and river transportation, north-bound trails overgrown with grass, the plight of the Texas drover was pitiful. A million head of unbranded cattle roamed the prairies south of the Red River. Mavericking had been legalized for the time being in Texas and the word, signifying ownerless cattle, had been incorporated in the vocabulary of the range.*

CATTLE WERE WORTHLESS.—Cattle were bartered on an unequal basis, to the loss of the owner, who took anything he could get for his stock. The scale of values in Texas during 1865 was \$2 a head for yearlings, \$3 to \$4 for two-year-olds, \$5 to \$6 for three-year-olds, \$6 to \$7 for four-year-olds. On this basis the drover could exchange cattle for goods, allowing the merchant a profit of 400 to 500 per cent. No one offered cash for cattle. Seventy-five head would buy a good saddle horse and a two-horse wagon could be obtained for one hundred head of Longhorns. The drover who had the greatest number of cattle with his brand on them was actually the poorer. Coupled with this discount in values at home, there was a prejudice at the North against Texas cattle on account of disease, that set every hand against the drover.

This prejudice dated back to pre-war days, when Texas drovers, starting in 1856, reached the St. Louis market with cattle. Wherever these herds had come in contact with the farm cattle of Missouri, they left a trail of disease and death. Ten years later, in the year following the close of the war, attempts were made to resume trailing, thousands of head being

*Samuel A. Maverick, Texas pioneer, member of the Congress of the Republic of Texas, temporarily resided at Decrow's Point on Matagorda bay in 1845. A neighbor who owed him \$1,200 which he could not pay in cash, gave him 400 head of cattle to square the debt. Maverick turned them over to a family of negro slaves, as cattle were worth little. The cattle grazed uncared for and their increase over-ran the neighborhood unbranded. The settlers referred to them as "Maverick's." The term, first definitely employed, soon became general, being applied to the thousands of unbranded and ownerless cattle that grazed the coastal plains of Texas. The term spread to other regions and finally reached Colorado with the first trail herds, and later was incorporated in the phraseology of statutes that forbid "mavericking," or appropriating unbranded calves.

started from Indian Territory and Texas toward Sedalia, Mo., which was then the terminus of the Missouri Pacific railway. Border ruffians, the term applied to bandits who had operated under cloak of war, continued their depredations and they held up trail herds at the Kansas-Missouri border. Armed opposition came also from farmers who dreaded the mysterious malady that came in the wake of the Texas herds. The result was that most of the drovers turned back into the grazing country. An estimate of the drive of 1866 was 262,000 head, very few going through to market.

Stagnation unparalleled afflicted an industry that had grown up unchecked by competent knowledge of marketing, unprepared for war, and fostered blindly by the lavish hand of Nature, with bountiful grazing resources, a fecund breed of cattle and the desire of men for the lazy life of the hacienda and a picturesquely gainful calling, without arduous labor.

TRAIL HERDS GET UNDER WAY

It was not a Texan who led the way out of discouragement and distress, but a shrewd cattle trader from Illinois, Joseph G. McCoy by name. He knew there was a shortage of beef in the populous North and that farmers in Illinois and Iowa were growing a surplus of corn that might well be fed. Also, he was aware that no cattle were coming through from Texas to the St. Louis market.

The Kansas Pacific had been completed to Abilene and construction was being pushed westward. McCoy conceived the idea of diverting trail herds from Texas and the Indian Territory to Abilene, avoiding border opposition and getting cattle to the railroad for shipment to Chicago. He broached the subject to the officials of the Kansas Pacific, who had no faith in the plan, but were persuaded to build pens and loading chutes to accommodate 3,000 head of cattle. McCoy then started a man south on horseback to the Chisholm trail* to intercept herds and tell drovers about the new shipping point at Abilene. The first herd to follow the suggestion

*Confusion over trail names and routes has been cleared up by the Old Time Trail Drovers' Association, who approve the version given by W. P. Anderson as to the route of the original Chisholm Trail. Anderson was station agent for the Kansas-Pacific Railway at Abilene. According to his description, the point of origin of the Chisholm Trail was near the junction of the Grand River and the Arkansas in the Indian Territory (now Oklahoma). It was named for Jesse Chisholm, a Cherokee Indian trader, who trailed cattle to Fort Scott, Kansas, and other army posts prior to the Civil War. Later the trail followed up the Arkansas into Kansas, having its main Kansas base along Chisholm Creek near Wichita. Diversions reached various army posts and a route was laid out to Abilene. The extreme western point mentioned by Anderson, as reached by the Chisholm Trail, was Fort Lyon, Colorado. There was another trail from west Texas, up the Pecos into New Mexico and Colorado, with a diversion to Dodge City, known as the Tascosa Branch. This Pecos Trail was often erroneously called Chisholm Trail, confusion arising from the fact that John S. Chisum of Colburn, Texas, who trailed cattle to Colorado, used this route. The approved name for this route was the Goodnight-Loving Trail. John Chisum had no knowledge of the Cherokee trader whose name was spelled Chisholm.

was in charge of a drover named Thompson, the cattle being owned by Smith, McCord and Chandler, Missouri River merchants, who were running them in the Indian Territory. Before the season of 1867 was over 35,000 head had been handled at Abilene, selling there at \$15 to \$18 and bringing \$24 to \$28 a head at Chicago. Word spread of the new market and 1868 found Abilene crowded with buyers, among them many Colorado ranchmen, who came to stock up pastures with Longhorns.

REMARKABLE TRAFFIC BEGINS.—That was the beginning of a remarkable movement that reached 75,000 in 1868, 150,000 the following year and was destined to carry millions of southern cattle from the breeding grounds of Texas and Indian Territory to the eastern markets and to the ranches of western Kansas, Nebraska, Colorado, Wyoming, the Dakotas and Montana. The fourth year McCoy's estimate* was that 700,000 head were handled over the Abilene Trail. Thin and immature cattle reaching the railroad found ready buyers from Colorado and other range states and went westward by rail or trail. The Atchison, Topeka and Santa Fe was under construction and the Kansas Pacific was nearing the Rocky Mountains. Following Abilene came other cow towns—Newton, Great Bend, Dodge City, Trail City—each flourishing riotously in wickedness like the proverbial green bay tree, then falling into decay or, on later revival, assuming the character of substantial, respectable communities after their fling in the drama of the plains.

The railroads were intent only on spanning the continent from east to west. The telegraph followed the rails. Nature had provided no water courses to connect the grass lands of Texas and Colorado, so cattle had to be trailed at least to the railroad. This resulted in a scheme of beef production unique in history and which, from its inception in the distress of the Texas drover, has throughout been marked by great fluctuations, tremendous profits and corresponding losses; turbulence, strife, uncertainty and change, baffling to the economist, unfavored by the keen banker, but highly attractive to the speculative instinct that gave the cowman his daily thrill. It was a business that had hope as working capital, enthusiasm its chief asset and disillusionment an ever threatening liability.

FIRST TRAIN LOAD GOES EAST

While the railroads brought quick relief to over-production on the Texas range, they also furnished an easy outlet for finished cattle from Colorado pastures. The first trainload that went east from Colorado was loaded out in 1869 at Kit Carson, then the terminus of the Kansas Pacific. George Thompson brought this drove from Las Animas. This was the

*"Historic Sketches of the Cattle Trade."—J. G. McCoy.

beginning of traffic that became important by 1872, when 428 cars were shipped from Denver, 85 from Deer Trail, 162 from Kit Carson, and 116 from Cheyenne Wells. Denver banks financed this movement, several bankers engaging actively in the cattle business. Colorado owners also sold 31,250 head that year for delivery at North Platte on the Union Pacific, for filling Utah and Montana contracts, making the total cattle exports by rail 46,208 head, valued at over a million dollars. Cattle marketed eastward brought about \$35 a head and those going west, \$17. No record is available of the trail movement during that year, but far more cattle were trailed than shipped by rail.

Up to 1870 each owner rounded up his own herds, but it was found expedient now to combine forces and gather up the cattle in spring and fall on the community plan, the first organized roundup taking place below Platteville in 1871.

STOCK GROWERS ORGANIZE

The call for the first meeting of Colorado stock growers was signed by Joseph L. Bailey, proprietor of the Bull's Head corral in Denver. The organization meeting was held at the American House the evening of January 9, 1872, A. J. Williams being chairman, and W. Holly, secretary. The purposes set forth by Bailey were: "To protect the interests alike of stockmen, ranchmen and farmers, and to harmonize, as far as possible, whatever might be conflicting in the great interest of agriculture and stock raising."

Efforts to carry out the plan according to Bailey's purposes failed, though the first two sessions included both the plowman and the cowman; in fact, also the sheep raiser. It soon became evident, however, that harmony was impossible between such divergent interests and those whose chief business was farming made no effort to remain members of an association organized for the protection of the range industry. Those who helped shape the organization were Bailey, I. P. VanWormer, J. H. Pinkerton, W. W. Roberts and George W. Brown. The first legislative committee was composed of John G. Lilly, L. F. Bartels, Peter Erkens, John S. Wheeler and John Hittson.

Permanent officers chosen were: John G. Lilly, president; J. L. Bailey, vice-president; W. Holly, secretary; A. J. Williams, treasurer. Executive Committee: W. W. Roberts, James M. Wilson, J. L. Brush, Alfred Butters and George W. Brown.

AN EARLY-DAY HERD LAW

A herd law was on the statute books at this time, having been passed by the Territorial Legislature in 1864. It applied only to Douglas and Weld counties, but it seems never to have been enforced. The law provided that "No person farming or cultivating land within the limits of Douglas and Weld counties shall be required to fence or inclose same against any stock running at large, or herded within said counties. All persons owning or having charge of stock will be required to herd or confine same during the season of growing crops." The law empowered owners of crops damaged by stock to seize the animals and impound them until reimbursed for their loss.

The existence of this statute furnishes effective proof of the fact that general agriculture was in the ascendency in Colorado before the range industry became important. At various times in later years farmers have made efforts to obtain a herd law which would throw the burden for stock damage on the owner of the herd, but without success. The stockmen succeeded in having it established as a principle of law that it is incumbent upon the farmer in a range state to protect his crops and the grazier, by the very nature of his nomadic business could be held liable only in case his animals broke through a prescribed fence, whether this be of barbed wire, or poles, or other construction firm enough and in proper repair to hold stock out.

Legislation was passed at the behest of the newly-organized Stock-growers Association in 1872, putting the burden on the railroad company for losses killed by train. A schedule of rates of reimbursement was fixed at two-thirds the prevailing market value of the cattle. This schedule was as follows: Texas yearlings, \$7; two-year-olds, \$12; cows, three years old and over, \$16; American yearlings, \$12; two-year-olds, \$22; three years and over, \$30; American work cattle, \$37.50; American sheep, \$2.50 each; Mexican sheep, \$1.50 each. There came a time in the history of the industry when this rate of repayment made it more profitable for the stock raiser to sacrifice his cattle or sheep to the railroad than on the market, and when there was little regret by the owner if an engineer carelessly ran into a herd. In time the railroads fenced their rights-of-way, as was later required by law and demanded by the traveling public, who objected to frequent delays while the train crew went forward to chase cattle or sheep from the track.

One of the first accomplishments of the Colorado Stock Growers Association was to obtain the passage of a law providing that no Texas or Mexican bull should be allowed to run on the range except in the counties of Huerfano, Las Animas, Costilla and Conejos. These exceptions were

made at the request of the Spanish-American members of the Territorial Legislature, whose constituents did not favor improvement in quality of their stock.

BAILEY A FIFTY-NINER.—Joseph L. Bailey, who figured so prominently in the association during its early days, was a Fifty-niner, who gave up gold digging to engage in the meat business on Blake Street, Denver, buying a shop on credit and clearing over \$30,000 in eighteen months through the sale of meat to arriving emigrants and provisioning parties of prospectors for the hills. In 1865 he opened the Bull's Head corral, which was a market for livestock and the true forerunner of the Denver Union Stock Yards. He handled the bulk of the hay that came to the Denver market, his trade in that commodity reaching four thousand tons in one season. High prices prevailed and loads of baled hay sometimes brought \$500 to \$1,000 in the mining camps; and hay could be had for the cutting in every swale or valley. Many a ranchman got his start in hauling hay to the mines, where it was badly needed for the draft animals used in transporting timbers for mine work and for conveying ores and supplies. Oxen were too slow for the mines and they were superseded by horses and mules as rapidly as this better class of animals became available, though the bovine draft animal still did most of the general freighting. It was in 1864 when a train of half a dozen immense loads of hay, each wagon drawn by six yoke of oxen, came through Denver, and a chronicler of the day's news commented: "Each load probably contained four tons and is worth at present rates about \$600. At Central City each load would bring almost \$1,000."

By the time of the second annual meeting of the Colorado Stock Growers Association, February 1, 1873, the cattle population of the state had jumped from 142,178 in '71 to 242,372. Sheep were listed in 1871 at 184,577, and in 1872 at 266,015. These were assessors' figures, the actual number being much in excess of that given for taxation.

BUFFALO CHASE OUT CATTLE.—While the cattle herds were thus increasing, buffalo were still disputing the range with the invaders. On the ranch of Jared L. Brush, near Julesburg, buffalo were so plentiful in the fall of 1873 that they ate off all the grass, and cattle were driven south of the Platte. "Lately fifty Indians came to his camp and demanded dinner, which was furnished. About 700 Sioux and Arapahoes are in the vicinity, engaged in eating buffalo meat." That quotation is from The Greeley Tribune, of December 31, 1873, Brush's home being in Greeley.

PROWERS STARTED IN '62.—John W. Prowers, the pioneer cattleman of the Arkansas Valley, had been in business for a decade. Prowers crossed the plains with Colonel Bent in 1857. He left Bent's employ in 1862, but

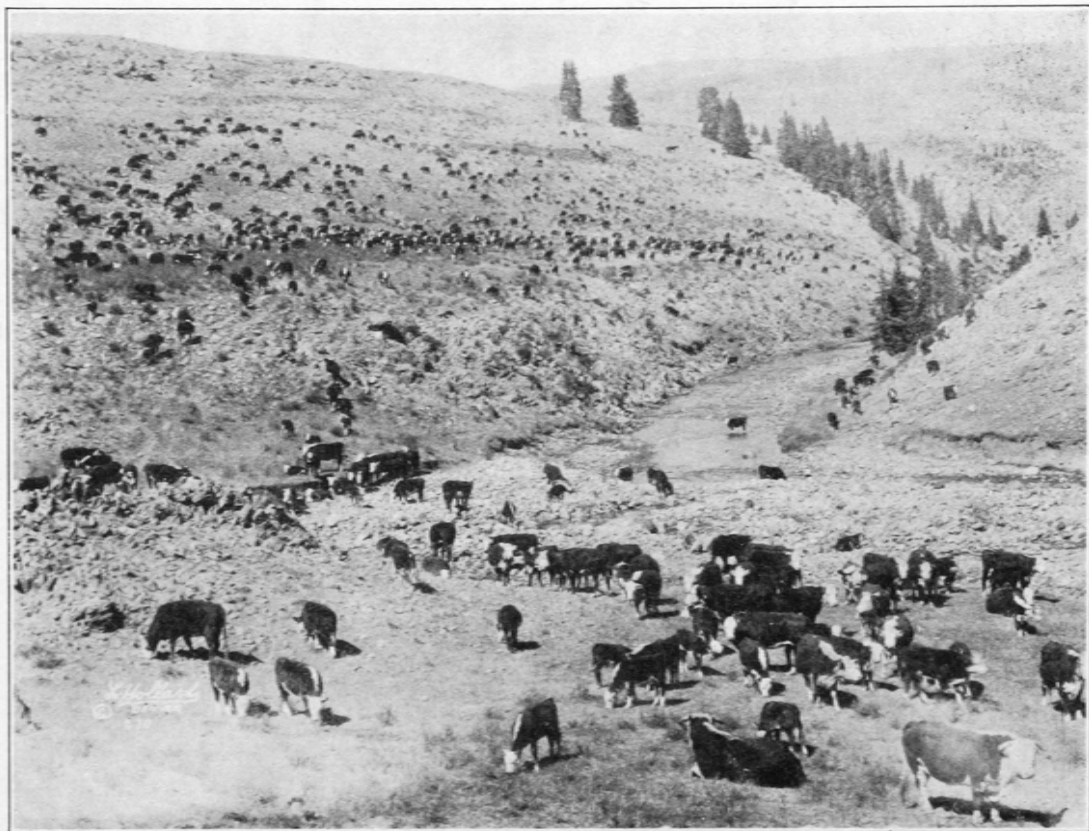
the year previous he had brought a herd of 600 cattle from the East. From that time on he engaged in the cattle business and also furnished government posts with hay. The foundation stock for Prowers' herd consisted of 100 cows bought of John Ferrill of Missouri. The Prowers range was from the mouth of the Purgatoire to Caddo. In 1870 Prowers imported a lot of purebred bulls and heifers from Kentucky. He was one of the first stockmen to use good blood on the range. The Pueblo Chieftain of May 30, 1872, announced that Prowers had sold 247 head of "fine American cattle," which were shipped to Major Smith of Illinois, and which were declared to be the best beeves that had been shipped out of the territory up to that time. Prowers was using Devon, Durham, Hereford and Jersey breeding stock.

BREEDING FARMS ESTABLISHED

Three breeding farms were established during 1872 and 87 pedigreed Shorthorn, Devon, Jersey, Hereford and Galloway bulls had been brought into the state, Shorthorns predominating. Sheep improvement was indicated by the importation of 456 Merino, Southdown and Leicester bucks. These figures were given in the annual report of Secretary Holly. Captain Joseph S. Maynard was chosen director for Colorado in the American Shorthorn Breeders Association. The pioneer committee on purebred sires appointed at this second session, was composed of Captain Maynard, W. Scott and J. W. Chatfield. This committee reported about three hundred head of herdbook cattle in the state.

BUILDING UP THE HERDS.—During the five or six years preceding, drovers of Texas cattle had brought herds into Southern Colorado for summer pasturing and fattening, thence to be sent to markets both east and west, but since 1870 there had been a falling off in the drives and general diversion of the Texas business to the railroad at Abilene and other Kansas points. Temporarily at least this had thrown the Colorado stock growers back on their own resources, and they were making a strong effort to build up their herds through importations of good beef blood.

At the second meeting of the Association, Dr. H. Latham of Wyoming brought to the attention of the stockmen some facts and figures that served to stimulate their interest in both cattle and sheep. He pointed out that in 1867 there were in the United States forty-two million sheep and that there had been a decrease by 1871 to thirty-two million. The nation had imported seventy million pounds of raw wool in 1871 and over fifty million pounds of manufactured woolens—as much as all our thirty-two million sheep had produced. He said it would take sixty-four million sheep to supply the demand for wool in the United States.



A modern herd of Herefords on the range in Conejos County. Photo copyrighted by L. Hollard, Denver.

In 1870 there were in the United States only about as many horses as there were families. "Double the number of horses in the United States and you multiply the motor power of the producing classes, which would revolutionize production and prices," was Dr. Latham's suggestion. He urged expansion of all phases of livestock production, for the reason that "Three-fifths of the whole area of the country lies west of the Missouri River and is as yet unoccupied. There are remaining a thousand million acres inviting either the miner, the grazier or the plowman. The vast hordes of Europe and of the older states are moving to occupy it. The era of migration is just dawning. The tides are not moving now at the pace of the old ox-wagon, but with the rapidity of steam. They will occupy your plains and valleys and mountains; and where are the horses with which they are to turn over your soils, move fencing and building material, tend the flocks and herds and transport your mountains of ore? You have yet to produce them.

"In dairying the prospect is not less inviting. The sweetness of your grasses, the character of your wild mountain streams, the low temperatures and the equability of your climate, all point to an excellence of dairy products which should give you the preference in any market. Establish butter, cheese and condensing factories on your streams. Managed with the proper skill, you will build up this industry the equal to that of New York, where it is foremost among the products of the Empire State."

Both as to general livestock production and dairying, Dr. Latham's advice proved an incentive to development, and subsequent events show that it was sound.

CONFLICT OF IDEAS.—There was sharp conflict of two ideas at the very beginning of development of the range industry, early in the seventies, due somewhat to the influence of the Union Colonists at Greeley, who were small holders, so fixed in the ways of the down-east farmer that they built for themselves a wire fence of forty-five miles, completely enclosing the colony lands. This fence not only kept out the cattle of the lords of the prairie, but it was notice to the world of the independence of the colonists and adherence to democratic forms of American land ownership, as opposed to the feudalistic idea extant on the range. Ever after the Greeley fence typified a community set apart, or super-imposed on the wide-open West, whose influence gradually bore in upon, penetrated and finally permeated the older system.

COWBOY, COW PONY AND STEER

Texas steers were always unruly. They were accustomed to men on horseback, and when approached a-foot there was alarm and flight. If the

herder of those days was "wild" it may be ascribed to the nature of his occupation and that of the animals he had to subdue, for they were equally wild. Herding was anything but a peaceful pursuit, especially at the round-up, when the cattle were brought in for branding, sorting out marketable animals, and shipping. The cowboy, the cow pony and the Texas steer were three of a kind, each in his place suited to the part played in the business of converting grass into beef.

The bronco, as the Spanish term for the cow pony indicates, was "rough"—a descendant of the horses brought to America from Spain by the conquistadores, reverting to wildness, recaptured and tamed for use in riding herd by the American settlers of the Southwest. The bronco was of the same stock as the Indian's cayuse, though more civilized by bridle, bit and saddle. He had wonderful stamina, and as a runner held his own with the Kentucky Thoroughbred and was capable of being highly trained for the business of herding. Perfect co-operation between cowboy and cow pony was usual in the round-up or on the trail, the wiry, intelligent animal sensing the will of the rider instantly and bringing up with a jerk when the lariat was thrown over the horns of a steer.

Branding the new crop of calves or rebranding when change of ownership made it necessary, was a lively operation. Searing the brand of ownership on the hip or side of an animal is an ancient practice, probably as old as the use of the hot iron for branding slaves, or as a method of identification of criminals. The Spaniards brought their branding irons from Europe. The practice was in vogue in southwestern America with the rise of the cattle industry, and is still the method used on western ranges, although it reduces the value of the hides for leather. It persists because there seems no other way of permanently and visibly marking cattle so that a rider on the round-up can readily pick any brand out of the herd.

CONFUSION OF BRANDS






















































































When herds multiplied with the sudden rise of the range industry in Colorado, great confusion of brands resulted. Some form of registration and systematic marking had to be devised. At first registration of brands was conducted by counties, but later legislation was enacted providing for state registration. Still there were numerous duplications, and county lines were of no effect, because of the wide area over which the herds ranged.

The Colorado brand book, in which all brands were registered and illustrated, at one time reached such bulk that copies cost stockmen nine dollars each. Even at that figure the volume, while serviceable to a degree, only emphasized the fact that there existed an unwieldy conglomeration of marks

which cried aloud for system and order. Finally order was brought out of chaos by W. C. Baker, for years secretary of the State Livestock Inspection Board, who devised a system of brands based on the alphabet, numerals and geometric figures in orderly arrangement.

COLORADO BRAND BOOK.

ARAPAHOE COUNTY.

J. W. Adams, Deer Trail.  I. sh., l. s. & l. b. b. b. same l. sh.	Wm. Adams, Denver.  Wm. Adams, Denver. 
Levi Ackroyd, Denver.                                     	Maize Alderides, Denver. 
The Aitafia Live Stock Co., Littleton. 	
David Allen, Woman Creek. 	
J. W. Allison, Denver. R I s.  I. h., ho. l. e. h. b.  I. sh.	
Frank Aichelman, Brighton. FAA	
The American Cattle Co., Denver. 1-1, 11 sh. -1 s., 11 b. h. b. s. l. th. M-4, 1 s., e. m., o. & u. s., r. & c. l. e.	
John P. Anderson, Denver. JPA	
Arkansas Valley Land and Cattle Co. (Id.), Denver. --88 e. m., u. s. r., c. l. 88 I. s. or l. sh.  I. h.  88-1 s. or l. sh.  I. s.  S I. s.  S-1 s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.  I. s.	Other brands, 7, 8B, TI, LO, 7C, A, J, WB, SD, T, B, TL, -8 C, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
John K. Ashley, Denver. AB	
John A. Askew, Denver. JUN I. s., TEA I. s., e. m., c. r., h. b.  I. th.	
Mrs. E. A. Aultrey, Box Elder. GU	
Anna R. C. Ayers, Denver. AS  Rudolph Baatz, Denver. 	
C. A. Babcock, Lyman.  I. th. h. b. same l. th.	
A. B. Babcock, Littleton. LON I. s., e. m., c. r., u. $\frac{1}{2}$ c. l.	
John S. Babcock, Denver. BIB e. m., c. r. s. f. l.	
Thos. Bades, Bennett. TBT	
Clarissa M. Baker, Denver. CMB	
Sarah Kate Ball, Brighton. KB	
Wm. W. Ballard, Watkins.  I. h. b., l. sh.	
Fred. J. Banks, Watkins. 6+ and 	
John W. Banes, Byers. JU I. s. & l. b., c. & u. b., l. & u. s., r. e. h. b. same l. sh.	
Anselms Bancharc, Denver. D7	
Chas. Bartels, Denver. 	
Barney & Lamborn, Bennett.  I. h. h. b. same l. sh.	
F. J. Bancroft, Denver. OJO r. s. h. b. same r. sh.	

Page from the Colorado Brand Book of 1887

LONGHORNS CAME FROM SPAIN

Texas cattle came from Spanish foundation stock, their native home being the Andalusian plain. Three centuries of rustling in Mexico had not improved them. They were as unlike American and English bred beef cattle as though a separate species. They were light-bodied, long-legged, thin, with elongated heads, narrow muzzles, wide-spreading curved horns, measuring five feet or more between tips. There was little resemblance to the blocky type of short-legged English and Scotch cattle upon which Colorado ranchmen had begun to build in a limited way when the drives began. What was lacking in type and conformation was emphasized also in the quality of beef, Texas and tough being synonymous.

Better bred beef stock could hardly have survived the wild conditions under which Longhorns were raised in Texas. Mild winters and good grass with excellent water were only half the story. Protracted drouths and extremes of temperature were frequent in Texas, then as now, and distressing alike to man and beast. These very conditions fixed the hardy type and precluded the possibility of prime beef, such as comes from the soft-fleshed, fat cattle of the British breeds. That the Texans improved on Colorado grass is true as to weight and finish, but the finest grass could

not alter a physical structure that was the result of centuries of natural selection in a harsh environment.

METHOD OF ACQUIRING PASTURES

In acquiring pasture lands, it was customary to file on or purchase quarter sections of land fronting on water courses, so that actual ownership might extend only a fourth of a mile, which would be sufficient to control the backland, because the grass was useless without water and the general opinion was that, without irrigation, no crops could be grown. Once having acquired considerable water frontage, the adjacent open range could be appropriated without formality of law, but with the sanction of custom and tacit consent of the community, which found in cattle or sheep raising its chief industrial asset.

MADE THEIR OWN LAWS.—Due to this freedom from legal restraint and the general belief that the country was fit only for grazing, there developed an attitude of *laissez faire* on the part of the public that led to the industry virtually making its own laws, which, though first unwritten, were nevertheless fairly well observed and later became incorporated in the statutes of Colorado. That abuses of the range privilege crept in was only natural. Still, the basis for this system of self-government was a desire for harmony between men engaged in a common calling, who, though competitors as individuals, realized the necessity for unity of action as an industry. Their associations carried out this thought to the ultimate in self-imposed usage and regulation, respecting each other's rights on the open range and standing together against thievery, alteration of brands, mavericking and other forms of outlawry more effectively, perhaps, than if regulatory measures had originated with the government. While many violations were charged to stockmen, the offenders were the crooks to whom any business is a temptation that offers easy opportunities for swindling under circumstances that make discovery difficult.

REVIVAL OF FEUDALISM

Strife between cattlemen and sheepmen was not surprising. The industry was a revival of feudalism. There was hardly a semblance of government over the vast areas of prairie and mountain lands when the first drovers came, and even after stable government had been established the grazing country was still without effective supervision, because it was not settled and it seemed valueless except for pasture. After the range was occupied, a measure of self-government was established and when controversies arose, such as the trouble between sheepmen and cattlemen, it was natural that the range users should attempt to settle it among them-

•

selves. While the feudal lords of the range had no vassals, they were in possession of the land and they looked with disfavor on interference with their grass and water.

For many years after the first settlement, the fable of the "Great American Desert" persisted among those who occupied the territory. They did nothing to expose the myth and everything to perpetuate it. It was easy to believe, by people who had been accustomed to agriculture under sub-humid conditions, that farming without irrigation in an arid climate was impossible. There was hostility toward the settlers who homesteaded with the intention of making a living on a quarter or a half section of land. Looking back in later years, mistakes were realized on both sides. Careful classification of lands in the beginning would have saved for pasture many rough or sandy areas that have never become profitable for general farming, but have long since been lost to the grazier.

Before the homesteading movement got well under way, efforts were made to have the plains region set apart for perpetual use of the livestock industry. In 1876 the commissioner of the General Land Office, in his report to the Secretary of the Interior, urged that the public domain west of the 100th meridian and east of the Sierra Nevada Mountains should not be surveyed in minute subdivisions "except only small portions which are susceptible of cultivation without artificial irrigation." He recommended that the "barren lands" be thrown open to purchasers in tracts of unlimited size, "as they are worthless without irrigation, which cannot profitably be undertaken for small areas of 160 acres each."

PRESIDENT HAYES APPROVES

This recommendation found favor in Washington, President Hayes in his message to Congress under date of December 3, 1877, saying: "I would also call the attention of Congress to a statement made by the Secretary of the Interior concerning the disposition that might be made of the desert lands not irrigated west of the 100th meridian. These lands are practically unsalable under existing laws, and the suggestion is worthy of consideration that a system of leasehold tenure would make them a source of profit to the United States, while at the same time legalizing the business of cattle raising which is at present carried on upon them."

Backing up the president's recommendation came action by the Colorado Stock Growers Association at its January meeting, 1878, memorializing Congress to set aside "the vast region of country which, owing to climate and lack of rainfall, is unsuitable for any but pastoral purposes" and lease or sell the lands for a nominal sum.

GRANGE FAVORS FREE RANGE.—Another view of the range question had been expressed in a resolution adopted by the Colorado State Grange three years before, asking that "Government lands in Colorado, east of the Rocky Mountains, which are not situated under irrigation ditches now constructed, or within one mile of running streams or living water, ought not to be sold, but should, by act of Congress, be set apart for perpetual free pasture, to be used in common by the people of Colorado; provided that nothing in this resolution is intended to interfere with the homestead act, with giving titles to timber lands, or for mining purposes."

Had the recommendation of President Hayes prevailed, there would be a different story to tell of the West's development. The 100th meridian, designated as the dividing line, westward of which all unirrigated upland was merely pasture, passes through Dodge City, Kansas. The western border of this vast empire of grassland, the Sierra Nevada range, lies over the line in California. Between there is a thousand-mile stretch of country running the breadth of the national realm from Texas to Canada. Included in this area is Colorado, in which state alone there has since been developed under dry farming methods over twelve million acres. To all of this was applied the sweeping classification of "worthless" by the commissioner of the General Land Office in the first year of statehood!

CLAIMED EXCLUSIVE RIGHTS.—That stockmen believed themselves secure in possession of the range was brought out in litigation in which the United States Circuit Court returned a verdict in favor of the plaintiff, an English company, for \$500,000, the defendant being a Colorado cattle company.

The court records show that the English company bought from the Colorado company a ranch in eastern Colorado described as "150 by 120 miles of free range and exclusive right thereto, three thousand acres of freehold pasture, nine miles of river front and tributary streams and nine thousand head of graded cattle." The suit arose over alleged false representations regarding extent of the defendant's possessions.*

CATTLEMAN AND INDIAN

AN INDIAN'S ULTIMATUM.—"Colorow owns this country. Buffalo are Indian's cattle. White man's cattle eat all grass, buffalo die, no feed. No hunting, no meat, no robes. White man must go, damn quick. Colorow no big fool. No more talk."

This message, delivered through an interpreter from the ugliest-tempered, marauding Ute in Colorado, was addressed to a cattleman on Chief Creek in Yuma County, in 1876. The cattleman was Joseph W. Bowles,

*New United States Cattle Company vs. William J. Wilson.

a Fifty-niner, who knew Colorow's reputation for treachery and the need for strong talk, backed up by a six-shooter. This is what he said to the interpreter in reply:

"Tell Colorow if he don't behave himself I will shoot a hole in him so big that a dog can crawl in. Now all of you, git."

That dialogue indicates just one of the handicaps that the pioneer in the range livestock industry on the plains of eastern Colorado had to overcome fifty years ago. A witness to this incident, Edward Bowles, son of the pioneer, resides in Denver.

JOE BOWLES' STORY.—Joseph Bowles came to the "Pike's Peak diggings" to seek gold, and he was fairly successful. He invested his money in land ten miles up the Platte, acquiring 2,000 acres. In association with George W. Harriman he became interested in irrigation, surveying a ditch in the Bear Creek Valley and tapping the creek near what is now the town of Morrison. With Harriman he built one of the first irrigation reservoirs, this being called Harriman Lake. Other small reservoirs were built, these finally becoming a part of Marston Lake, now a feeder for the Denver water system.

Bowles early got into the cattle business, having a small herd of high grade stock on the Box Elder, but deciding late in the sixties to move to Saguache, in the San Luis Valley, where there was unlimited range. For a few years he prospered, but by 1876 the sheepmen had come in and pasture for cattle became precarious. His herd numbered 1,400 by that time, and early in the year he decided to move out. When the caravan moved it was like the migration of a nomadic tribe of ancient times; the people of the household, the servants, horses and oxen drawing loads, and the herd of cattle following. Thus they departed from the San Luis Valley, seeking greener pastures. Over the tremendous mountain mass of the Sangre de Cristo led the way by Mosca Pass, down upon the Huerfano on the east side, thence to the Arkansas, crossing that stream at Rocky Ford, and out upon the grassy plains, then showing few habitations, no cultivated land, no fences or other barriers that signified civilization.

After many days the caravan drew up on Chief Creek near the head of the Republican River, west of Wray. There Bowles bought out a settler, acquiring about 4,000 acres, giving him twenty miles of river front, from which he controlled the back land, of use only to the man who held the water.

UTES WERE WATCHING.—A roving band of Utes had watched the approach of the caravan and noted signs of permanent occupation that were in progress when the Bowles family decided to settle on Chief Creek. Bowles knew the necessity for a showing of strength, and his first care

was to start building sod fortifications on a knoll overlooking the draw in which camp was made. Colorow, in command of the Utes, noting preparations for a stay, decided to visit the camp. He was accompanied by Washington, a halfbreed who acted as interpreter. Bowles asked what was wanted and then followed the dialogue above quoted. The Utes left the camp, but remained in the vicinity, returning twice to see what progress was being made for defense. Noting that Bowles meant to stay and to fight, if he had to, the Indians finally left the country, moving on westward to harass other settlers, burn stacks and corrals and drive off cattle when opportunity offered for a raid.

These details were obtained from an account of Joseph Bowles' experiences given to Albert B. Sanford, curator of the State Historical and Natural History Society. The rest of the story was given the author by Edward Bowles in 1925.

BUILT A SOD FORT.—"My father's first job was to provide protection for his family from the Indians," said Edward Bowles. "We built a sod fort on the rise overlooking the valley. This was similar to many other so-called forts, having thick walls of sod, a flat roof, and portholes, so that riflemen could guard it against Indian attack from all sides. A trench ran from the fort down to the house. From the fort we had a clear view of the house and the corrals, which were down on the flat near the river, protected by the ridge. The ranch buildings were within rifle shot of the fort, and while we were never attacked, we knew that the preparations we made kept the Indians away. It did not stop thieving, but there were no open attacks on our ranch.

"Indians were not the only menace. There was an outfit of cattle thieves down in the country south of us who made raids every now and then. This was at the time when the Union Pacific had built to Julesburg, and that town was a lively place. It was through our own foreman that the cattle thieves were discovered and their hiding place, known as Robbers' Roost, was located and destroyed. Our foreman was an old-timer in that country and he had run some cattle of his own under the brand of VAN. He had his brand on the door of his dugout, and this door disappeared in one of the raids made by the cattle thieves. While riding herd south of what is now Eckley and about twenty-five miles from that point, he found a dugout under a hill with his old branded door used as an entrance. He reported back to the ranch and my father went out with a posse and they 'cleaned up' the place and the robbers left that country.

"My father ran about 8,000 to 9,000 head of Texas steers, old-time Longhorns, and we had four or five hundred saddle horses in use. We were out from April to November, and our cattle would run from the

Arkansas on the south to the Platte. In fact, they sometimes crossed the Arkansas.

BOUGHT FROM TRAIL HERDS.—"We bought our steers from the trail herds that were driven through over the Chisholm trail from Texas to Montana. At first my father would have to go down to Trail City to buy. That place was on the Santa Fe where the town of Holly now is, near the Kansas line. It was about the toughest town that God ever let live; nothing there but saloons and gambling houses, hotels and corrals. Here the Colorado stockmen would meet the Texas drovers who came up with the trail herds, and we would buy maybe a thousand or two or three, whatever we could pick up of yearlings that looked good to us, and they would run around an average of \$8 or \$9 a head. We would drive them to the ranch, brand them and turn them loose, to be rounded up after double wintering them, and then sell off around \$35 to \$40. Yes, there was money in the business then. I used to hear my father say that if they ever got so they would cost him a dollar a head to finish he would quit the business.

"We had good grass, especially along the river. When we first landed there my father turned the cattle out and after the folks finished dinner not a hoof was in sight. He got scared; thought the Indians had sneaked up on him and driven them off, but he went over to the natural meadow where he had left them and there they were lying down, every head happy and contented in grass so high that when they did lay down you couldn't see them. When I took over the ranch later I put up a lot of hay along that river and put in alfalfa and irrigated it and developed the place, which was naturally as good a grass country as a man could find.

NO FENCES TO HINDER.—"At first there wasn't a fence anywhere. I have ridden clear through from the Republican to the Arkansas, and there was nothing in the way of a fence to stop me. There wasn't a fence even along the Arkansas, and you could ride up the river from Trail City to Rocky Ford without having to open a gate. Rocky Ford was where we would cross to go south, for there were times when I rode clear over to the Purgatoire (the Picketwire, the cowmen called it) after our cattle, for they would drift south of the Arkansas.

"Later on as more cattlemen came in, the trading places were changed. Hugo was one of the next after Trail City where we went, then to Brush, where the trail crossed the Platte. In the early years we had to drive to Republican City, Nebraska, to ship our cattle, as that was the end of the C. B. & Q. Later on when the railroad came into Colorado, the Burlington gave us a shipping station on the ranch at Robb. When the Texas drive finally quit on account of the railroads coming in, the cattlemen began to improve their herds. I still remember the old Longhorns. Put a bunch of

them in the corral and you could hear a grinding noise from the rubbing of their horns. We took up Shorthorns later, while others went in for Herefords, and for a time there were quite a few Aberdeen-Angus cattle in the country. These were crossed with the natives, but they made an ugly, spotted cross that looked like a Holstein, and the cattlemen didn't like them.

"About 1885 my father bought his first registered bulls, and from then on operations were restricted. In fact, he fenced in his home range, and it took just 65 miles of fence. He used the flat barbed wire and bought it, as well as the posts, in Chicago. It was an expensive job, and a lot of it had to come down later when the federal government ordered the cattlemen to take down all fences on government land. The Bar-Eleven changed its character with the times, and in later years we had a cattle ranch with our own and leased land, with entirely different conditions from those which my father found when all outdoors was open to the first settlers who came with their herds".

CATTLE CONCENTRATED ON THE PLAINS

SHIPMENTS BY RAIL.—In 1877 the cattle population of Colorado was concentrated in the plains area, comparatively few herds having been started in the mountains. The estimated value of cattle for that year was \$2,233,200; of "wool, hides, etc.", \$1,340,000. Reports of railroad shipments for the year show where the cattle originated. The Kansas Pacific shipped 407 cars from Denver, 501 from Deer Trail, 143 from River Bend, 304 from Hugo, 43 from Aroya, 71 from Kit Carson, and 17 from Wallace, the first station across the line in Kansas. The Atchison, Topeka & Santa Fe did not give details by stations, but reported about the same number as the Kansas Pacific, originating mainly at Pueblo and Las Animas. The Union Pacific reported 15,000 head shipped east, the total for the three railroads being 74,440 head, going principally to Kansas City, Omaha and Chicago. Value was figured at \$30 a head. The year's wool clip was estimated at 5,000,000 pounds and valued at 17 cents a pound, or a total of \$900,000. These figures tell the fiscal value of the industry near the close of the first period of development and just before English and Scotch capital became interested, submerging individual ownership through the overshadowing wealth of powerful corporations.

Fascinating stories of Colorado ranch life were appearing in the great newspapers and in the magazines at home and abroad. Writers of ability came to the state to visit the ranchos, interview the rancheros and get first-hand information and local color on the life of the Western cowboy and the romance of the cattle business. Vivid tales were published and the

road to wealth via the picturesque prairie was so alluringly marked that promotion was stimulated, though the plain truth would have been sufficient to interest capital.



"Cutting Out." From drawing by W. A. Rogers in "The Cattle Ranches of Colorado"—Harper's New Monthly Magazine, November, 1879. (Reproduction by Grant Eddy.)

ILIFF A CATTLE KING

"The Cattle King of Colorado" was the title conferred upon John W. Iliff, in his day the largest individual operator in beef on the Colorado range. Iliff crossed the plains in 1859, following the lure of gold that took so many young men from the farms and cities of the older states. His own story of how he left home in Ohio was that, after completing his education at Delaware College, his father offered to invest \$7,500 in a good Ohio farm for him if he would stay. "No," said Iliff, "give me \$500 and let me go west."

He engaged in business at Denver, and in 1861 invested in a small herd of cattle. His first big deal came to public attention in 1868, when he contracted to supply beef to the construction camps and the troops that guarded them along the line of the Pacific Railway, which was advancing westward from Nebraska into Wyoming. He placed an order one day in June, 1868, for \$45,000 worth of cattle, purchased in southern

Colorado, for cash. They were driven to his pastures along the Platte, where he had started development of the series of ranches that gave him control finally of most of the water over the immense area from Greeley to Julesburg.

DESCRIBES ILIFF'S OPERATIONS.—In 1877 the ranch was visited by James Macdonald, a representative of "The Scotsman," a publication at Aberdeen, Scotland, interested in the possibilities for British investments in the American cattle business. Macdonald wrote a report replete with exact information which stands today as a clear picture of Iliff's operations. This report indicated only about 15,000 acres in Iliff's ownership, but 650,000 acres of open range directly controlled by the water on his holdings. With 35,000 cattle on nine ranches, some 6,000 to 7,000 breeding cows, the use of only high grade Shorthorn bulls and an annual turnover of 10,000 to 15,000 Texas steers, trailed up from the south and finished on the grass in one or two seasons. The account which follows goes into detail on prices, weights and costs of operation:

The Cattle King of Colorado is Mr. J. W. Iliff of South Platte. He began cattle raising on a small scale in 1861 and now owns close to 35,000 cattle and nine ranches, extending to over 15,000 acres and stretching to over thirty miles along the north bank of the south fork of the river Platte. The State land grants, extending to about 650,000 acres, have not as yet been located, and therefore, the prairies of Colorado are all (or have been) subject to the homestead and pre-emption laws, which make it impossible for a man to buy up large tracts of land. Mr. Iliff obtained his large estate by buying out settlers, many of whom were his own cattlemen, who homesteaded or pre-empted most probably with the view of selling off as soon as possible. Mr. Iliff keeps from 6,000 to 7,000 cows and uses none but Shorthorn bulls. He has been using improved sires right along and now he has probably the finest stock in the State. He buys his bulls generally in Illinois and Iowa, believing that animals bred in these states stand the change to Colorado better than those bred in more eastern states and pays for each from sixty to eighty dollars. His draft for this year, numbering fifty, arrived the other day, and these will be grazed during the present summer on reserved pastures and fed on hay, in sheds, the first winter so as to accustom them gradually to the rigor of the Colorado winters. About the month of July, Mr. Iliff buys in from 10,000 to 15,000 Texas steers, rising two and three years, and retains them for a year or two and then exports them to Chicago as beef in the fall, along with three and four-year-old steers of his own breeding. When bought, these Texans weigh from 600 to 800 pounds and cost from \$11 to \$15; and when sold they weigh on the average about 1,000 pounds and bring from \$30 to \$37, or $3\frac{3}{4}$ to $3\frac{3}{4}$ cents per pound live weight. Mr. Iliff's steers of his own breeding weigh 1,100 to 1,200 pounds when sold and bring from \$38 to \$50, or from $3\frac{1}{2}$ to $4\frac{1}{4}$ cents per pound. These native steers would probably weigh from 600 to 700 pounds in beef, which would thus cost the man who slaughters the animals from $6\frac{1}{2}$ to $7\frac{1}{2}$ cents or from $3\frac{1}{4}$ d to $3\frac{3}{4}$ d per pound.

Mr. Iliff employs about forty men all summer and a dozen during the winter, and pays them from \$25 to \$30 a month and board. He requires 200 horses and these are all bought in and come mainly from Texas along with the cattle. Occasionally in a severe snow storm the cattle get a little hay, but never taste corn.—James Macdonald in "Food from the Far West."

Iliff died in 1878 in the prime of life, when his business had grown to gigantic proportions, that gave reason for conferring upon him the title of "cattle king," which few deserved, though it was bestowed upon many.

THE LARGEST CORPORATION.—While John W. Iliff was rated the largest individual beef producer in the state, the corporation that lived longest, handled the greatest number of cattle and controlled the largest acreage in Colorado, was the Prairie Cattle Company. It is doubtful whether any other corporation on either continent outranked it in numbers of cattle marketed when the full period of its existence is considered. The Prairie Cattle Company was organized under the laws of Great Britain in 1881, and dissolved by voluntary action of its directors in 1915. At the time of dissolution the last of its general managers, Howard Glazbrook, issued a brief review of the company's history. Scotsmen or Englishmen were selected as general managers, there being only one exception to this rule during the thirty-four-year period of the company's existence.

The property lay in three divisions, the Colorado holdings comprising 2,240,000 acres, and embracing a territory of 3,500 square miles. On this range in the early eighties there were nearly 54,000 cattle, in the management of which 300 horses were required. The range was east and south of the Purgatoire and Arkansas rivers to the Cimarron, this being the old J J range, that brand having furnished probably more cattle to the Kansas City market than any other single brand used on the western range. J J was from Jim Jones, head of the Jones Brothers outfit, whose herd formed the nucleus of the Colorado holdings of the Prairie Cattle Company and fixed the price which the Scotch corporation paid the various smaller ranchmen whom they bought out when they started operations in 1881.

Over the border in New Mexico and overlapping into the Oklahoma Panhandle was the second division of the company's holdings, known as the Croselle ranch, bought from Hall Brothers, the brand being Cross-L. This division embraced 4,032 square miles or 2,580,480 acres, with 57,799 cattle at the time of its first stocking up under the Prairie ownership. Five hundred horses were used on this division, the range being northeast New Mexico and a part of the neutral strip, or No Man's Land, which later became the Oklahoma Panhandle.

The third division comprised principally the L I T Ranch, purchased from the original owner, Littlefield, with headquarters at Tascosa, Texas, with its main range along the Canadian in the Texas Panhandle. The area was 400 square miles, or 256,000 acres, with about 30,000 cattle.

VON RICHTHOFEN WRITES A BOOK.—Soon after operations were well under way, Baron von Richthofen, then a member of Denver's foreign colony, and the founder of Montclair, a suburb, where he built what is still known as "the Castle," wrote a book entitled "Cattle Raising on the Plains." He got from the officers of the Prairie Cattle Company statistics

reflecting the extent of the company's business. The value of the entire property at that time (about 1883) was \$4,416,484. Operations were begun with 104,000 head and in two years this number had been increased to 139,000, "while in the meantime the company has drawn from the beef sufficient to pay all expenses and £10,000 in 1881 and in 1882 £50,000 profit."* According to the same authority 26,000 calves were branded in 1882. The three ranches were even then connected by private telephone line, while some other large ranches relied on the telegraph for quick inter-communication.

Tascosa, headquarters of the L I T ranch of the Prairie Cattle Company, was a historic spot. This was the crossing of the Pecos or Goodnight trail at the Canadian en route to Dodge City. Large herds congregated there, often being held by the sudden floods for which the treacherous Canadian was noted. When the swollen river held back the cattle tide, Tascosa became the center of life for a mob of impatient drovers and a mass of milling Longhorns.



*Modern-day cowboys ready for the round-up. (Photo copyrighted by L. Hollard.)
Horses now used are not the wild and wiry broncos of the old-time trail days, but well bred saddle horses.*

HE TOOK A CHANCE.—A bit of tragedy was related by Glazbrook as he told of the wind-up of the last great herd. Years ago, with the Canadian

*"Cattle Raising on the Plains."—W. B. Von Richthofen.

at flood, a foreman whose courage was undoubted was twitted by his cowboys because he decided to wait for the waters to subside. They thought swimming would be safe; the season was getting late, and Dodge City, with its hectic life, was beckoning. Stung by the sarcasm of his men, the foreman said: "All right, we'll swim." He started the cow column into the current. In midstream horse and rider were swept under. The herd got across. His body was found downstream where the swift waters had thrown it back to the taunting cowboys. In his coat pocket was a water-soaked letter from his wife begging him, if the river was up, to take no chances!

When the Prairie Cattle Company bought the J J herd it had already been improved with Shorthorn blood. The Croselle, too, had been using Shorthorn bulls, but later changed to Herefords. The L I T was stocked with Texas cattle, but the new owners began improvement with purebred sires of the Hereford breed.

MACKENZIE A MANAGER.—Among the general managers in the company's long career was Murdo MacKenzie, who later became head of the Matador Company in Texas and subsequently assumed management of one of the world's largest cattle concerns, the Brazil Land, Cattle and Packing Company, with headquarters at Sao Paulo.

Ten thousand calves were branded every year on the Croselle and the J J when the business was flourishing, while the L I T's quota was about 4,000.

DRIVING OUT THE SHEEP.—Peace and war alternated on the Prairie Cattle Company's range. Sheep herders from New Mexico at one time invaded the range. An armed band of cowboys descended upon the Mexicans, took their guns from them, ordered them to pack their burros, and then "assisted" them in driving their sheep back across the boundary of what was then the territory of New Mexico. The sheep were scattered; many animals were killed. Suits were filed by the owners of the sheep, but there was no proof that the Prairie Company had ordered the raid, nor was there any particular inclination on the part of courts and juries in cattle territory to look without bias on an invasion of sheep into a country where the water was owned by cattlemen and the right to the grass was thus sanctioned by usage, if not by law.

BRITISH COMPANIES PROSPERED.—The London Economist in March, 1884, reviewing the operations of British controlled cattle companies, stated that the Prairie Cattle Company, in the year previous, had paid a dividend of 20½ per cent, the Texas Land and Cattle Company 12½ per cent, the Matador Company 8 per cent, the Arkansas Valley Cattle Company 10 per cent. The Economist advised prospective investors to exercise care, as these companies had "gone in" before the advance came in cattle and land.

OTHER LARGE OPERATORS

There were other large companies that took rank with the British-owned corporations in numbers of cattle turned off. Pryor Brothers, with headquarters at Pueblo, placed the largest order in 1884, contracting for 45,000 head over the Texas trail. F. P. Ernest, in the same year, brought in between 8,000 and 10,000 for his ranches on the Republican and at Deer Trail; Shepherd & Scherrer contracted for 6,000 for their Republican River range, Henry Gebhardt was credited with 5,000, and the Arapahoe Land and Cattle Company 10,000 Texas steers, all trailed in from the southeast.

By the middle eighties there was keen rivalry between railroads for cattle business, though the lack of north and south arteries to the heart of the range country kept the trails open and well beaten by the hoofprints of the Longhorns. Dodge City got the bulk of the drives, and in March, 1884, the Dodge City Globe, forecasting the movement, said:

We can safely say that the drive will be fully up to last year, which a number of well-posted drovers estimated at 300,000 head. All cattle contracted are going direct to ranches at first hands, the contract price on those being about as follows: One-year-old steers, \$15 to \$17.50; one-year-old heifers, from \$17 to \$18; two-year-old steers, from \$19.50 to \$21; two-year-old heifers, from \$22.50 to \$24; three-year-old steers, from \$23.50 to \$25. Cattle will generally run about like last year's drive and the promise of the early spring will give them a good start. As drovers fail to get what they claim as a fair and reasonable shipping rate to Wichita Falls and points north, they will be obliged to take the trail and run their chances on getting through.

Attempts were made to interfere with trailing, drovers having a harder time year by year in maintaining an open road to the north. In 1884 a syndicate which, according to drover opinion, was backed by certain railroads, leased a strip of land through the Indian Territory, ostensibly for grazing, and then attempted to close the trails. Protest to the Secretary of the Interior prevented this.

WANTED A GOVERNMENT TRAIL

In the same year stockmen from all over the West gathered for a national meeting at St. Louis to discuss common problems, among other questions being that of trailing. A memorial to Congress was drawn up, asking the federal government to establish a great north and south trail, beginning at some point on the Red River and extending in a northwesterly direction to the Canadian border, utilizing government land where possible and acquiring intervening right-of-way by purchase. Opinions at the convention differed as to the necessary width of the trail, the proposals varying from five to fifty miles. This trail was to be fenced, the streams bridged, and shipping points established at strategic intersections with private trails, leading to the ranches that furnished the cattle in the Indian Territory and to those that bought them for pasturing in the north. The proposal got no further in Congress than introduction, as the railroads were

rapidly increasing their facilities and extending lines to tap the cattle country. Trailing continued until the early nineties.

MILLIONS DRIVEN NORTH.—An estimate made in 1884 was that from 1866 to the close of 1883, 4,707,976 head had been driven north from Texas to Colorado and other range states.*

SEASON'S GRASS WORTH \$30,000,000

Up to that time the public had become somewhat confirmed in the idea that the range industry was a bonanza business, though it had already been hard hit by occasional severe winters. Losses were expected as incidental to the business. There was some clamor for more humane treatment of stock, but the rangeman's answer was that Nature had provided the open prairie for just such use; that buffalo and antelope had weathered the storms of centuries, with the penalties that wild life has to pay, and that domestic cattle and sheep must become inured to the same hardships, else the world would go hungry for beef, and half clothed for lack of wool. "If we only keep what we can feed, thousands of miles of plain will lie useless and only the rich can eat beef, as domestic cattle fed in winter could not supply the demand." Such was the argument. Proponents of the industry had the figures to show that a beef and wool shortage existed. The grass was at hand to support the herds. Its value to Colorado for one season was estimated at thirty million dollars and as one contemporary writer put the matter: "On it will feed and fatten 1,500,000 head of horned cattle, 2,000,000 sheep and goats and 500,000 horses and mules."

BUZZARDS GOT THE CATTLE.—These figures were near the truth for the middle eighties. The other side of the story was brought out in 1886



Skeletons of storm driven cattle on the Colorado plains. Losses in blizzards frequently were heavy.

by Field and Farm, whose editor, Lucius M. Wilcox, said "For three years past the men who bought Texas cattle have lost money. Fifty thousand made food for the buzzards last winter. Had no cattle come up from Texas in 1885, Colorado would have been two millions better off today than it is. To sum this business up in a nutshell, every herd that crosses our Southern border from Texas is a detriment to the state. They eat the grass that better cattle should eat, and poison that which they do

*Colorado Live Stock Record, April 18, 1884.

not eat and after being paid for in good Colorado money, they seem to delight in wrapping their mangy hides about them and lying down to die."

This reflected the feeling of some far-seeing men who had always maintained hostility toward the Longhorns, and who upheld the viewpoint of the early comers when they procured legislation from the territory in its infancy seeking to close the range to the drovers from the Lone Star state. This viewpoint did not win then; it did not prevail in the middle eighties and it was not accepted until the lean years of over-grazing and the invasion of the homesteader forced the conclusion that the traffic in Texas cattle, in the long run, was unprofitable.

COL. PRYOR MADE MONEY.—According to Colonel I. T. Pryor of Texas, who operated for years in that state and Colorado, the drovers had a margin of \$3 to \$4 a head in the palmy days of the industry. In 1884, as quoted in "The Trail Drovers of Texas," he paid \$12 for yearlings, \$16 for two-year-olds, and \$20 for three-year-olds on the range in Texas, and he contracted to deliver these cattle to rangemen in Colorado and other western states at \$4 a head above cost. He sent fifteen droves northwest that year, 45,000 head in all. Eleven men went with each herd of 3,000, the outlay for wages being \$400, and for provisions \$100, cowboys getting \$30 a month and the foreman \$100. The length of the drives averaged 450 to 500 miles and the total cost for the fifteen drives was \$7,500. Colonel Pryor's estimate is that at present-day freight rates this movement would have cost \$25,000 to \$30,000. The loss in trailing that year was only about three per cent, or 1,500 head out of the season's total of 45,000.

NOT ALWAYS GAINFUL.—While the Texas drover prospered, the Colorado rangeman's end of it was not always gainful. Some men made money handling Texas steers, and some laid the foundation for fortunes, built up later by rising land values or banking and merchandising operations, but averaging up Colorado's part in the Texas trade, the final verdict is: unprofitable and unsatisfactory. And yet, Colorado had the grass and Texas was the only source of supply, in quantity, of the type of cattle that would show gain in weight and money under the rigors of the western range. McCoy, who originated the rush to Abilene, in his own story of the business for which he was chiefly responsible, says: "Indeed, Texan cattle beef then was not considered eatable and was as unsalable in the Eastern markets as would have been a shipment of prairie wolves."

If that was true in 1867, it was true fifteen to twenty years later, for there was no appreciable improvement in the quality of the Longhorns, though they were marketed in somewhat better flesh. The average consumer had to put up with what the market offered because there was not sufficient good beef to supply the demand.

Improvement, however, was in progress from the earliest days of the Texas traffic, as is evidenced by the fact that purebred and high-grade sires were purchased in car lots by the large operators on the Colorado range. John L. Routt, F. P. Ernest and J. L. Brush together owned 1,000 purebred bulls, which, according to 1886 scale of value, ranged in price from \$100 to \$500 each. Good sires also were in use on the range in Texas, but, because of the prevalence of Texas fever, improvement was much slower than in the western range area.

TEXAS LONGHORNS HAVE VANISHED

Just as the buffalo has become almost extinct, living today only in a few protected herds, with no probability of ever again being more than a zoological curiosity, so the Texas Longhorn has vanished from the United States. Few were seen in Colorado after 1890. They had been displaced by better cattle, the process of elimination and crossing going on both on the Texas breeding grounds and in Colorado, though here the great bulk of them were double-wintered on grass and sent on for slaughter. They are still found in some parts of Mexico and South America, but as long ago as thirty years their horns had become worth many times more than the live animals. Fifteen to eighteen dollars was a good price for a Texas steer, but many a pair of horns has been sold for two hundred dollars, and they gain in worth as antiquities do with remoteness from the period when they were commonplace. Even without other disqualifications, the horns were sufficient to make the Texas steer an economic anomaly after railroad transportation superseded trailing. Half the car space could be saved by shipping cattle with horns of normal type.

WINTER LOSSES WERE SEVERE

The range producer had constantly to face winter losses which, in specific instances that could be multiplied in proportion to the number of herds that roamed the prairies, sometimes took a third of the cattle. Out of twelve thousand head Iliff one winter lost only six hundred, James Bailey the same winter, however, reporting his losses 40 per cent of the herd. Farwell Brothers also lost heavily that winter, reporting 35 per cent of their cattle killed. These were Weld County herds, some others in the same county who had better natural shelter reporting light losses. For example, J. L. Brush, 5 per cent; Bruce Johnson and George Briggs, each 6 per cent. Sheep often suffered more than cattle, James Morse on the Platte in Weld County having lost four thousand out of eight thousand head in an April blizzard.

What winter losses meant may be better understood by the account of an eye witness who had a ranch ten miles west of Las Animas on the Arkansas. One morning in March, 1885, he rode to town along the river bank. He counted 900 carcasses of cattle and he found Rube Irwin "busy peeling them under contract with the owners." Rube had a wagon and team, an iron stake and chain, a skinning knife and whetstone. He would drive his team up to the head of a dead animal. Then he would rip the hide down legs and paunch, skin a little around the horns and eyes. Next he would drive his iron stake into the ground at the steer's head, fastening one end of the chain to the stake, the other end around the steer's horns. Then he would drive his wagon over the carcass until the rear axle was over the steer's head, and inserting a hook into the eye holes under the hide would drive off, stripping the hide from the body. Ten an hour was Rube's record. The hides furnished slender salvage from the blizzard's toll. As one writer of the day aptly phrased it: "Death stalked the plains and filled the gulches with carrion."

TEXAS CATTLE QUARANTINED

In the spring of 1886 quarantine against Texas cattle became effective, and Colorado, combining with Montana, stationed an inspector on the Cimarron River, where it cuts the southeast corner of the state. It was the inspector's duty to see that no cattle originating below the quarantine line in Texas were admitted to Colorado unless they had been held ninety days north of the 36th parallel of latitude.

Dr. George H. Glover was the inspector for the two states during three years. In his first year he inspected 242,000 head, mostly destined for Montana and the Dakotas. These cattle were following what was known as the National Trail, which wound along within the eastern border of Colorado from the Cimarron to the Platte, crossing the Arkansas at Trail City, near Holly, the cow town that succeeded Dodge City, as trailing was forced gradually westward.

METHOD OF INSPECTION.—Inspection consisted in the examination of sworn statements covering ownership of brands and certifying that if the cattle originated below the quarantine line, they had been held the required period north of 36 to insure their immunity to Texas or splenic fever. At that time Longhorns still constituted the great bulk of the movement from south Texas, although north of the quarantine line they had been supplanted largely by better cattle. Herds in the Texas Panhandle and in most of the Indian Territory had been bred up on native American stock till there was little trace of the old Spanish strain.

Quarantine regulations were enforced through the office of State Veterinarian, created by the fifth General Assembly in 1885, which also provided for creation of the State Veterinary Sanitary Board. This board went through various political changes until 1903, when it was incorporated



A latter-day round-up on Jack Elliott's ranch in Weld County, 1919.

in the Stock Inspection Board, composed of nine stockmen. Dr. Charles G. Lamb has served as State Veterinarian 25 years, intermittently, holding the office from 1887 to 1893, with a three months break in 1891; then for eight years, 1903 to 1911, and then from 1915 to the present year, 1926.

CAUSE OF FEVER DISCOVERED.—During the period of sanitary supervision of the range industry, the greatest achievement was the discovery by Dr. Cooper Curtice of the United States Bureau of Animal Industry that the cattle tick was responsible for Texas fever and that eradication of the tick meant suppression of the scourge which had turned the hand of every friend of good cattle against the Texas steer. While that uncouth creature was himself immune to fever, his hide was often literally covered with the blood-sucking, disease-spreading mites that contaminated grass and water and worked havoc in the herds of better bred cattle on western ranges.

Discovery of the cause resulted in effective prevention of splenic fever, the last serious outbreak in Colorado occurring in the Platte Valley near Sterling in 1891. Blackleg, another scourge that oftentimes wiped out calf herds on the range, is now controlled by the general use of aggrassin, a preventive serum. Other diseases less virulent, but nevertheless requiring constant watchfulness, that are still serious factors in livestock losses, are mange, or scab, among cattle and sheep and bovine tuberculosis, which occurs mostly in dairy herds. Glanders in horses, once quite prevalent, has ceased to be a problem.

These changes, bettering health and sanitary conditions in the range industry, have been due to the progress of veterinary science and the co-operation of the stockmen with the State Stock Inspection Board, an

official body, whose members serve the industry without salary, receiving only their necessary traveling expenses in attending meetings.

WILD ANIMALS A MENACE.—Aside from the menace of disease, the rangeman has predatory wild animals and poison weeds to contend with. Mountain lions and wolves attack lambs and calves and the United States Biological Survey constantly has hunters employed to protect herds and flocks by ridding the range of these animals. Poison weed eradication is an activity of the Forest Service, directed particularly at larkspur, which is fatal to cattle when the plant is in its early stages of growth, but does not affect sheep. Prairie dogs and gophers are destructive of pasture lands and are fought continuously by both state and federal agencies co-operating with the associations of stockmen.

THE SHEEP INDUSTRY

While the early Mexican farmers in southern Colorado had flocks of sheep and the industry among the people of Spanish descent is as old as the settlements, Americans were slow to take up this branch of farm husbandry. The first record of any flock of considerable size was that of Lafayette Head, driven into Conejos County from the Taos country in New Mexico in the middle sixties. This flock consisted of about one thousand native sheep of very poor grade, shearing about 2½ pounds of wool per head. "Zan" (Alexander) Hicklin followed soon after with a flock which he kept on the Greenhorn Range south of Pueblo.

MAYNARD BRINGS PUREBREDS.—The first flock of fine-wooled Merinos was brought in by Capt. J. S. Maynard, who also had been a pioneer in purebred Shorthorn cattle importations, to his Meadow Springs Ranch in Weld County. He bought the sheep in Canada and Illinois, shipped them to Cheyenne in 1869 over the newly completed Pacific railway and drove them to his ranch near Carr. Another shipment coming in the same way was owned by Harvey D. Ring, and went to El Paso County, giving the sheep industry in that region a start.

William N. Bachelder of Fort Collins was among the early breeders of purebred sheep. He imported a carload of foundation stock from Vermont in January, 1873, at a cost of about \$4,000. They were bought from several Vermont breeders and were all purebred Merinos. The flock consisted of one hundred ewes and fifty bucks. It took two weeks for the shipment to reach Cheyenne by rail from Vermont and then a week longer to drive the sheep to the ranch in Larimer County, 60 miles from the railroad. Bachelder was a Vermonter and operated the Vermont Ranch near Fort Collins.

From 1870 to 1880 sheep raising developed slowly, but beginning with the latter year, progress was rapid. In 1880 the count of range sheep in Colorado was about 110,000; in 1886 this had increased to two million. The average clip in the early years was under four pounds, but by the middle eighties it had come up to seven pounds. The total wool clip for 1885 was about 8,000,000 pounds and late in the season quotations for staple at shipping points were fifteen to eighteen cents. The value of the investment in sheep and property devoted to that industry in 1886 was \$4,500,000.

Wool was of inferior grade, as the foundation stock was principally Mexican, inured to climatic hardships of scant grass and poor water after centuries of roughing in the southwestern region.

These sheep, like the Texas Longhorns, were a survival of Spanish importations, without renewal of blood, though the progenitors were of good wool-producing strain. Purebred rams were introduced by American flockmasters, but improvement was hardly perceptible, nor could much be expected in the short period which these flockmasters allowed themselves for building up what they called a money-making flock.

TRUBLE BEGAN EARLY.—Trouble between cattle and sheep raisers cropped out almost immediately with expansion of the sheep industry after the railroads were completed to the Rocky Mountains and quick transportation to market provided an outlet for wool. Like the cattle industry, sheep raising was attractive because of the low cost of range stock and the fact that the expense of herding was trifling and grass and water were free. The sheep raiser had as clear a right to appropriate the grass as the cattleman, but the test of control, sanctioned by custom, was priority of possession. If cattle were there first and a sheep herder came in there was trouble. The argument is not altogether unfavorable to the cattle raisers' side. Sheep crop the grass closely and tramp down what they have eaten off, leaving the ground practically bare. On what the cattleman would call good grass, sheep were ruinous, while on rocky or sparsely grassed areas they could subsist and not interfere with cattle. This naturally relegated them to the higher mountain areas, or to foothills where timber was thin and the grass unattractive to cattle. This distinction was not made by the owner of the sheep, though it was observed later when large operators became engaged in both lines of production and found it quite possible to separate the two classes on the basis of difference in pasture conditions.

Brutality that admits of neither apology nor excuse was ascribed to cattlemen in the war to keep sheep out of certain areas. At first the organizations of rangemen made no distinction between cattle and sheep growers, admitting both to membership, but it soon developed that the two

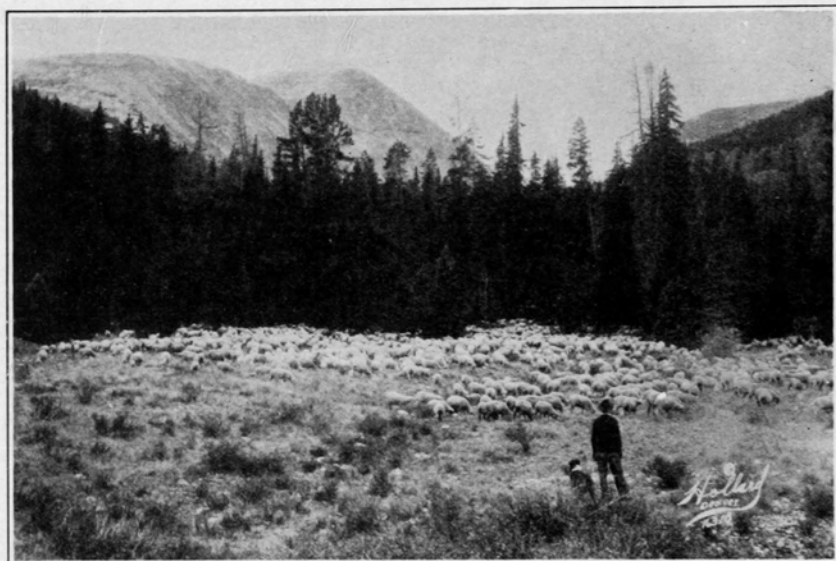
classes were antagonistic and the sheep men withdrew and formed an association of their own. Both associations officially deprecated strife and at their annual meetings constant reference was made to the subject, cattlemen insisting that raids on sheep camps were made on individual responsibility and against the counsel of the organization. Rewards were offered for perpetrators of outrages, but it is not of record that any were arrested for running sheep out of the country. There was usually an undercurrent of sympathy for the aggressors, sometimes an outspoken and nearly always a covert antagonism toward the sheepman. It was a state of mind arising from public sentiment in the cattle country, which, however ugly and unjust is not to be ignored in recording events of the range industry.

Examples could be multiplied, but one will suffice to indicate the character of the attacks made on flocks which were usually in charge of Mexican herders. One morning in March, 1877, at the White Ranch, six miles east of Pueblo, a sheep herder, who had left his flock of 1,600 safely corralled at night, found between seven and eight hundred dead by poisoning when he returned to the corral. Other hundreds of the flock had been clubbed to death or their throats cut, or otherwise mutilated. The few left alive were crippled.

POISONED THE FLOCK.—The sheep belonged to Bartels Brothers at Pueblo. Bran, poisoned with strychnine had been fed to the flock. A reward of \$3,000 was offered for arrest of the perpetrators, one-third of this by the owners, one-third by the Colorado Sheep Growers' Association and the balance by the State, through Governor Routt. The reward was never claimed. Such incidents were of frequent occurrence over a thirty-year period and sometimes they ended in bloodshed, many a life having been lost in the quarrel over range "rights." "Deep regret" was always expressed in the resolutions, but these expressions could not solve the problem and there was no solution until the so-called rights had been legally established and the range, as was the case on the National forests, came under official supervision. Strife was inevitable under the free range system.

PANIC OF NINETY-THREE.—Though natural conditions for sheep raising in the mountains of Colorado are ideal, the industry has met many obstacles aside from opposition of the cattle raiser. After a comparatively flush period of twenty years, 1893 brought demoralization, through economic factors over which the sheep raiser had no control. One factor was the general depression which was nation wide that year, but hit Colorado particularly hard because of the decline in silver and the other was an effort at Washington to put wool on the free list. The western sheep raisers' predicament was set forth in that year by a statement from Francis E. Warren of Wyoming, who was operating both sheep and cattle

ranches, and who acted as spokesman for the sheep industry, because he had been in the United States Senate, though at that particular time he was back in private life. He called attention to a reduction of 40 to 60



*Kenneth Chalmers' flock on the range in Park County.
Photo copyrighted by L. Hollard, Denver.*

per cent in sheep values and insisted that the removal of all duty on wool would throw 750,000 men out of employment or business, and inflict on the nation an agricultural and industrial loss of \$200,000,000.

SHEEP HIT BOTTOM.—Market reports at that time showed western sheep selling at Chicago at \$1 to \$2 a hundred pounds, the producer losing a dollar a head on every animal marketed. Entire bands on the Western range were being sacrificed at \$1.25 to \$1.50 a head, prices that matched the figures at which Colorado ranchmen had purchased their foundation herds from the Mexicans twenty-five years before. There were more sheep on the Eastern Colorado plains than in the mountains in 1893 and many banks and mercantile establishments were sustained largely by cash from the wool clip. Wool was stagnant, a condition that seemed to be world wide, for Colorado sheep raisers were told to get what comfort they could out of the fact that Australian sheepmen were skinning sheep carcasses and selling the pelts, neither the meat nor the sheared wool being salable, while live animals were bringing 50 cents a head.

THE FLOCKMASTER'S PLIGHT.—“Despised and rejected of men” might well be applied to the flockmaster in the realm of the cattleman; neglected and scoffed at in the market place, scorned by statesmen, and yet, the honest product of the sheep's back was sought after then as in ancient days when the shepherd's calling was not considered a reproach.

If in these periods of depression the industry reached bottom, so again there were other years when wool was as precious as silk and the flockmaster became the envy of even the cattle drover. It was in these flush times that men decided to take a double shot at wealth and many have succeeded with cattle and sheep where there was ample range and the herds and flocks could be pastured apart. The recent big advance in sheep came in 1924 when seven million dollars was added to the value of the industry in Colorado.

NEW MARKET IS OPENED.—When irrigation farming reached its high stage of development through the coming of the sugar beet industry, an era that began in 1899, both classes of range producers benefited, for it opened to them a new market at home for the products of the herds and flocks. Lamb and steer fattening became important operations on the irrigated farms which produce a million and a half tons of beet pulp to fatten the steers and lambs grown on the range.

FATTENING LAMBS FOR MARKET

Lamb fattening as an industry in Colorado had its inception in a blizzard that overtook a shipment of 2,400 lambs from the New Mexico range in the fall of 1889. The shippers were Bennett Brothers. The storm stopped the lambs at Walsenburg, tying up the railroad many days. When transportation was reopened the lambs were in such poor condition that, instead of sending them east for fattening, they were shipped to Fort Collins where alfalfa hay was plentiful at two dollars a ton. They were fed generously on the cheap hay, finished on corn and marketed at Chicago in 1890 at \$5 to \$6.40 per hundredweight, making a good profit for the feeders. Charles F. Blunck was the Fort Collins feeder, who finished these lambs for Bennett Bros.

A MILLION A YEAR.—From that beginning at Fort Collins, the feeding industry has grown until northern Colorado alone fattens nearly a million lambs a year, while other districts along the Platte and the Arkansas fatten several hundred thousand. Lamb feeding started ten years before sugar factory by-products became available. It has grown far beyond the supply of Colorado range sheep, New Mexico, Wyoming and Idaho being drawn on for lambs to fill the feedlots. While wool was at one time the

sheep grower's main source of income, lambs now bring in the bulk of the revenue.



Fattening lambs for market in Northern Colorado.

STEERS FOR THE FEEDLOTS

Steer feeding had its beginning in the late seventies when the value of alfalfa became known, though it did not reach large proportions until the sugar industry was established. Unlike sheep, the number of marketable cattle produced on the range annually is greater than the feeders of Colorado can absorb, and thousands of head go to cornbelt feedlots or directly to the packers each fall. While these are marketed as grassfed cattle they are carried through the winter on hay and not compelled, as in the early days, to subsist the year around on pasture. That was possible on the plains, but in the mountains snow covers the meadows half the year.

An overstocked range, glutted markets, a sweeping tide of emigrants and an army of determined homesteaders filing on grassland that looked good for general farming without irrigation, had its effect on the range industry and by 1890 the bonanza days were over. If the years that followed lacked romance, it was none the less a lively period from rancor and reaction after the boom. Toward the close of the period came better prices for beef, a more settled feeling among those who carried on and results from the effort made to build up the herds on good blood. Both cattle and sheep growers had long been well organized locally and in state associations, inspection of cattle was a success, theft had been practically

eliminated and the range had been crowded back more and more into the mountains, while the industry as a whole had obtained a good business footing.

NATIONAL ORGANIZATION NEEDED

The need of national organization was apparent and Colorado, being in a position of leadership, if not in numbers of cattle on the range, decidedly as to quality, took the initiative. The first annual meeting of the National Stock Growers' Association, at which organization was perfected, was held at Coliseum Hall, Denver, January 25, 1898, nearly one thousand delegates being registered, from every state west of the Missouri River, with a few from eastern states. John W. Springer was made president, in which capacity he served six consecutive terms. F. J. Hagenbarth of Idaho succeeded him in 1904.

LAST FEAST ON WILD MEAT

The last great feast on the wild meat of the plains took place January 27, 1898, as a spectacular feature of the National Livestock Association convention. The fact that the barbecue was free caused a stampede of the hoodlum element that necessitated police interference and proved distressing to the Denver livestock interests who were hosts, as well as to the city's guests who had come from all the western range states to attend the convention.

Five buffalo, four elk, two bears, fifteen antelope, ten beeves, thirty sheep and two hundred opossums furnished the meat course for the barbecue. Eighteen cooks were busy all night in preparation for the meal, the menu comprising, in addition to the meat, 15,000 loaves of bread, 500 pounds of coffee, 3 barrels of loaf sugar, 10,000 pickles and 35 barrels of yams. The meat was broiled over pits, the work being supervised by camp cooks, who had run chuck wagons on the range in years past.

CROWD RUSHES THE GATE.—Tickets had been issued entitling the holders to enter the enclosure at the stockyards where the feast was ready at noon on a bright, mid-winter day. It was in the wide distribution of tickets that mistakes were made, many falling into the hands of undesirable people who had no right to partake of the generous feast. So great was the jam at the Denver Union Station, where shuttle trains were put on for the stockyards, that an iron fence which protected the tracks, was broken down and people rushed pellmell to fill the waiting cars. Illustrations of the rush show car platforms and roofs covered with men, while some rode on the engine pilot.

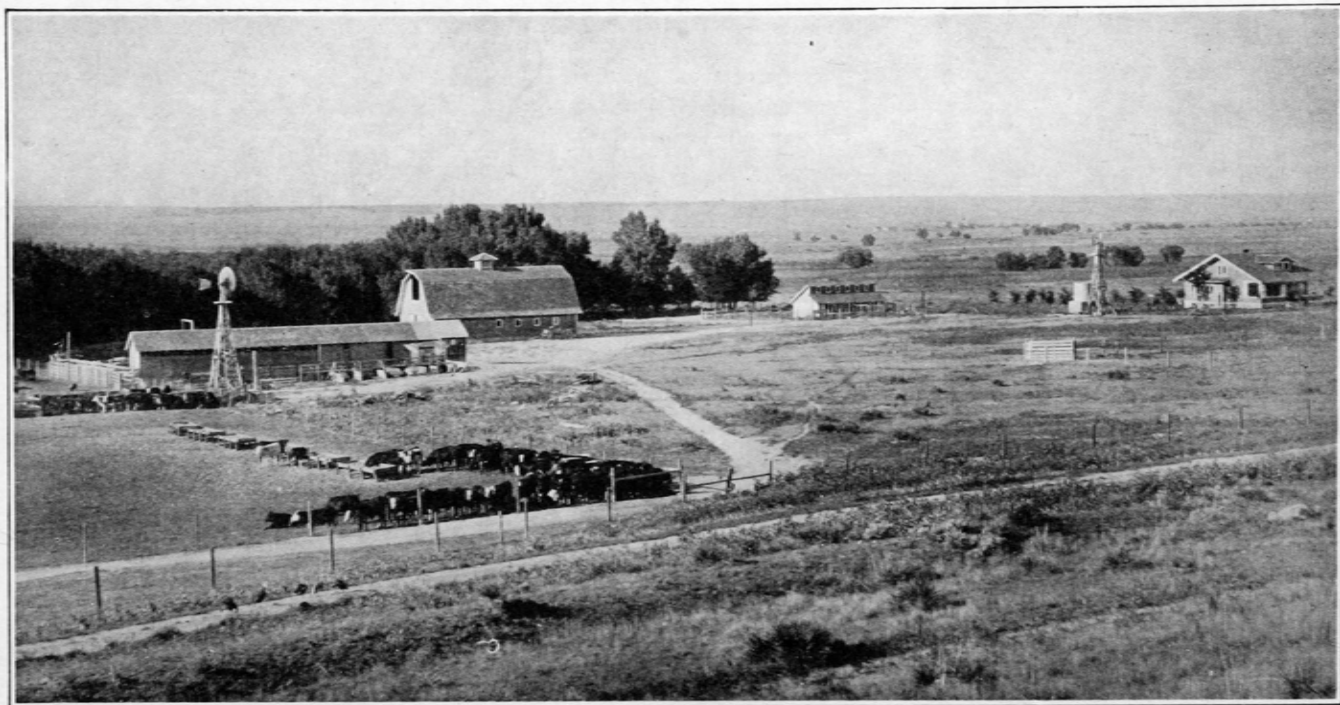
Newspaper estimates were that 30,000 people went to the stockyards. There the jam proved unmanageable and at noon there was a wild rush for the long tables on which the feast was served. The hoodlums who got to the tables first stayed there and kept guests away. One reason for the rush was that beer was served free with the meat, 300 kegs being tapped for the thirsty.

BARBECUE ALMOST A RIOT.—What was planned to be a diversion proved thus a regrettable event for which Denver felt humbled and apologetic toward her guests. The mob made a clean-up, reports of the affair next day stating that even the dishes disappeared. The missing articles included 1,000 steel knives and forks, 2,000 tin cups, 50 china platters, 25 galvanized iron pails, 20 iron meat hooks; also cleavers, hatchets and carving knives, together with even the beer glasses.

Denver in 1898 was still a wide-open town, saloons, gambling dens, wine rooms, and other forms of lawlessness flourishing without interference, and political corruption going hand in hand with these conditions. Description given by the newspapers of the mob that raided the feast indicated that this affront to the stockmen came from the scum that rises on the stagnant pool of vice. There were many fights during the struggle to keep back the mob, women and children were trampled, and one murder occurred, during the hectic hour that marked this last public meal on wild meat.

JOHN CLAY READS THE SIGNS.—During the convention of 1898, John Clay, for years a dominating figure in the livestock industry of the West, said: "As the red man was driven to his reservation, as the buffalo disappeared, so the days of open ranging are going and that life of rollicking work in summer and loafing in winter is fast approaching dissolution. In Texas it is all barbed wire. Colorado is a state of pastures. There are open ranges, but cattle cannot get away ten miles except they put their noses against the barb."

HOW JERKY WAS MADE.—Yarns of the old days were spun in hotel lobbies, history and tradition were recalled and re-told. Perhaps it was the influence of the barbecue that brought on a discussion of the fare that drovers used to subsist on. At any rate, the explanation of how "jerky" was made is worth recording. It was called "jerky," "carne seco," or just dried beef, according to the lingo of the locality from which the cowboy using it came. Buffalo meat, or in later days, cow beef, was cut into long strips about an inch in width. These strips were dry salted and then dipped into hot brine and hung on a riata stretched in the sun. In a few hours the meat was thoroughly dessicated and it was then packed away tightly into boxes or bags.



Ranch of A. A. Reinhold, Jr., near Hale, Yuma County. Cattle run on grass and then are finished in the feedlots.

In preparing the "jerky" for cooking it was first hammered on a smooth stone, or a piece of iron, and then cut across the strip with a sharp knife, shaving it fine. It was then put on the fire in a skillet and covered with water, skimming it as it came to a boil. When the water was almost cooked up, an egg or two was stirred into the meat, or if there were no eggs on hand, flour was stirred into the mess, which was heavily seasoned, a red pepper pod being commonly put in for the chili effect. While cow beef was good thus prepared, venison was delectable; or, in range lingo, scrumptious.

EIGHT MILLION HEAD REPRESENTED.—At the second annual meeting, also held in Denver, January 24, 1899, President Springer, in his annual address, said there were delegates present representing eight million head of livestock, valued at two hundred fifty million dollars. When the association spoke Congress and western state legislatures took notice. Leasing of the public domain was one of the chief questions considered at the first few meetings, and while sentiment among the large operators was favorable, the small holders thought they saw in this movement an effort to crowd them off the range and they fought leasing, effectively blocking action.

ASSOCIATION SPLITS.—Dissension came over various policies, a part of the membership withdrawing and joining the American Cattle Growers' Association, which had been formed at Denver in 1901. Simultaneous with the meeting at which the American was formed, there was held in Denver a session of the Western Range Association, confined to Colorado stock raisers, representing four million head. The first officers of the American were: F. C. Lusk, California, president; Frank C. Goudy, Colorado, first vice-president; M. K. Parsons, Utah, second vice-president.

The Range Association was officered by: W. L. Grubb, Garfield County, president; Conrad Shaefer, Morgan County, vice-president; C. W. Bowles, Douglas County, secretary; T. S. Harter, Lincoln County, treasurer. The Range Association was made up of the smaller cattle growers, whose herds numbered from one thousand and five hundred head on down to one hundred or less.

Differences between the American and National were ironed out and on January 20, 1908, a combination was formed, adopting the name American National Livestock Association. This organization is still in existence, having held its 29th annual convention at Phoenix, Arizona, January 13-15, 1926. Officers for the current year are: President, C. M. O'Donel, Bell Ranch, New Mexico; first vice-president, L. C. Brite, Marfa, Texas; second vice-presidents: E. L. Burke, Omaha; H. G. Boice, Phoenix, Arizona; George Russell, Jr., Elko, Nevada; Hubbard Russell, Los Angeles; William Pollman, Baker, Oregon; attorney, H. S. Cowan; secretary, T. W.

Tomlinson. The two last named have served continuously since re-organization in 1908.

STATE ASSOCIATION STICKS.—Throughout the turbulent years of the range industry the Colorado Stockgrowers' Association, now over half a century old, has served steadily and efficiently as the medium for voicing the demands of individual producers for improvement of the business, through legislation or other necessary action. In 1925 the state association had on its membership rolls more than forty associations besides hundreds of individual stockgrowers. The officers in 1926 are: Harry J. Capps, Walsenburg, president; Richard Dillon, Sedalia, vice-president; J. H. Neal, Denver, treasurer; B. F. Davis, Denver, secretary-manager. The board of control is composed of Frank Parsons, Weston; Field Bohart, Colorado Springs; C. T. Stevens, Gunnison, and Kenneth Chalmers, Garos.

While the divergence of purpose and interest that cropped out in the formative period of the National Association indicated a state of flux, it also forecast the end of large operations on free range. In March, 1901, an unnamed cattleman was quoted in the Denver Record-Stockman thus: "For the past twenty years we have been destroying the grass on the range at an ever-increasing rate. We have been burning the candle at both ends, the settlers taking up the valley and the water supply and the stockmen fighting each other for the grass on the hills. Ten days ago I passed over miles of desert which only a few years ago I remember to be good grazing land. Today the grass is as utterly swept away as though it had never been. We used to destroy about a million acres a year in this way, but now we are spoiling range at the rate of six or seven million acres per annum. Within two years at the outside the Government will be in absolute control of all public range, and sheepman and cattleman will dwell once more in unity, but with a fence between them."

U. S. FOREST SERVICE STEPS IN

He spoke prophetically. Already the United States forest reserves had been created and a new controversy had come apparently to increase the difficulties of the range user. It was not strange that the rank and file were unable to grasp the significance of the conservation movement, and it took ten years for regulation of grazing within forest boundaries to win full confidence, though even yet there are outcroppings of strife, due to the method employed, or to the fees charged, and not to the principle of protection of the range.

Leading the opposition to federal control of grazing on the United States forests was Elias M. Ammons, who was a state senator and later became governor of Colorado. He was a cattle raiser and a strong advocate

of early maturity of beef, introducing the idea of finishing what is called "baby beef." He made a study of range grasses and grazing practices and it was in his capacity as a grazier that he ran counter to federal supervision, not because of any opposition to conservation of the grass, but because of the source from which control was being exercised. He was a firm believer in states' rights and his conception of representative government admitted no form of autocratic or bureaucratic administration. Though finally acquiescing in federal control, his contention was for laws by Congress to govern use of the forests instead of the established system of regulation by bureau, with a federal officer as final court of appeal. In that view he had the support of a majority of range users.

AMMONS STATES HIS POSITION.—A public statement of Ammons' position on the issue of grazing control from federal sources was published in 1909 and is summed up in the following quotation: "Our constitutional law proceeds on the theory of the widest liberty of action for the individual and the restriction of official power. The theory of the Forest Service is that the official shall have the widest authority and the citizen shall have no power to thwart his will. Instead of the people making their own laws they are governed by rules made by the officials, subject to change or annulment at the pleasure of the Service."

Assumption of control by the government was justified by the argument that the natural resources of forest, grass and water had been and were being wasted by the states through political control, or lack of any regulation, and that because the issues were national and regional, rather than state-wide, federal authority was essential. Opposition to the Forest Service dwindled as range users and officials got on a basis of understanding and in later years animosity practically ceased, though an occasional flare-up still occurs.

THE STATE'S GRAZING RESOURCES

The National Forests of Colorado contain approximately ten million acres of grazing land, while another equal area is listed as grazing on the plains and in public domain outside of forest boundaries. The forest lands in 1924 supported 296,300 cattle and 860,600 sheep. The total beef cattle population in the state is around 1,000,000 head, which does not include steers or other cattle in feed lots. The sheep population, exclusive of lambs on feed, was somewhat less than 1,000,000 head in 1925. Cattle use the forest range six months in the year, while sheep, pastured in the higher areas, have only a three months' grazing season. While large areas of the plains remain unfenced, the lands are either held in private ownership or are owned by the State, all being subject to lease and used largely for pas-

ture by adjacent small landowners. The State has over two million acres of its lands under agricultural and grazing leases. The only free range remaining is on the public domain, the unappropriated and unreserved government lands, comprising over seven million acres, of which possibly one-third are suitable for grazing.

REGULATION OF GRAZING.—Regulation of grazing was practicable only in the mountain region where government supervision could be applied. There was no one on the plains to save the grass from destruction, though that could have been done, under proper classification of lands and with systems of pasture rotation, such as a few stockmen applied successfully, among them John Painter, of Roggen, long a leading figure in the American Hereford Cattle Breeders' Association, former president of that body and for many years an officer of the Western Hereford Breeders' Association. Painter witnessed the passing of the range on the plains, changed the character of his operations to meet new conditions and by application of the principles of range management, succeeded in bringing back to virgin vigor the native pastures on which his purebred animals now thrive.

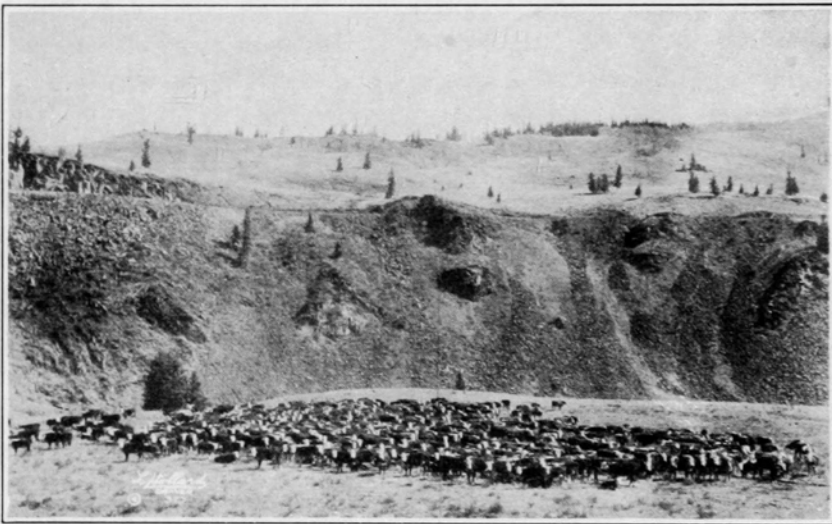
THE PAINTER RANCH.—In the fall of 1883, when the Eastern Colorado plains, quoting John Painter, were "a virgin stock paradise," he and his brother Joseph took up land south of Roggen in Weld County. The following year they brought in a load of Shorthorn cattle, the best they could pick up on farms in the vicinity of Ames, Iowa, intending to make dairying a business until the steer crop would be ready to market. They did not find dairying profitable, but beef conditions were excellent, 100 per cent calf crops being the rule, with finished animals being marketed from grass alone at \$2.90 and \$3 per hundred weight. During the seasons of 1887, '88 and '89, three-year-old steers were sold on the Denver market for Christmas beef weighing 1,250 and 1,500 pounds, without feed other than grass and native hay. These steers were from good grade Shorthorn cows and the best obtainable registered Shorthorn bulls. Ten years later steers from the same quality of stock, handled in the same way, on the prairie pastures were sold as feeders, but they weighed only around 1,000 pounds. "Under the uncontrolled open range system our heritage was soon wasted and almost destroyed," are the words of John Painter.

Later a change was made to Herefords and the Painter ranch has since become the breeding ground for that class of cattle, and of world-wide reputation. The property is still (1926), one of the large grazing ranches in Colorado, comprising 30,000 acres under ownership and lease, its principal business being the production of breeding animals which thrive on hay and grass. In 1925 this ranch led Colorado Hereford breeders in number of calves registered, there being 308.

BREEDING BEEF CATTLE

While the breeding of registered beef cattle is an industry distinct from that of running cattle on the range, the two lines are parallel to a certain degree. Without the open range the breeder would have had no large market for his bulls, and, bred under range conditions, the purebred cattle he disseminates are the product of environment and conditions insuring a hardy, indigenous offspring, fit to build up range herds.

With the ebbing of the Texas tide Colorado range producers took more thought for quality and, while a few had always been large purchasers of registered bulls from eastern breeders, they were now beginning to recog-



The Braiden herd of Hereford cattle, rounded up at Osier, in Conejos County. Photo copyrighted by L. Hollard, Denver.

nize the value of using sires, bred and grown under the favorable climatic influences of the high altitude of Colorado. As the range became more restricted, large herds were cut down and more attention could be given to breeding up both on farms and ranches.

Mention has already been made of the earliest advocate of Shorthorn cattle, Samuel Hartsel, who made no attempt, however, to disseminate good breeding stock, but was in the beef production business.

FIRST SHORTHORN EXHIBIT.—The first notice of registered Shorthorn cattle at the Agricultural Society's fairs came in September, 1869, when Colonel William F. Moeller made an exhibit of three Shorthorn bulls and one cow, the pedigrees of which were published in the newspapers. Moeller

was a dealer, soliciting orders from Colorado ranchmen and making selections from herds in Kentucky.

MAYNARD FIRST BREEDER.—The first importer, breeder and disseminator of registered Shorthorns was Capt. J. S. Maynard of Meadow Springs Farm, near Carr in Weld County, who also brought in the first registered rams of which there is any record. Capt. Maynard bought Shorthorns at the first consolidated blooded stock sale held in the United States. This sale was at the new Chicago Union Stock Yards in November, 1870. A few years later a part of these cattle were resold by Maynard to R. A. Southworth, who started a breeding farm at Baldwinsville, twelve miles



Shorthorn breeding cows on C. A. Melburn Ranch, Elbert County.

up the Platte from Denver. Maynard disposed of the last of his purebreds in 1877 to George Grant, an Englishman, who founded the Victoria Colony in western Kansas. Grant's purchase included fifteen bulls and several cows, all bred on Colorado soil, besides the herd heading sire, Sunrise, 18415, who was bred in the East. The animals averaged \$400 at this sale.

In southern Colorado Daniel W. Crane of Fremont County was a breeder of Shorthorns in 1871. His ranch was on Hardscrabble Creek and the herd was headed by Sir Henry, a bull brought from Kentucky. Crane had fifteen purebred animals and he was breeding up native cattle.

CHURCH STARTS THE HEREFORDS.—Herefords were exhibited at the same fair which directed attention to the registered Shorthorns, the exhibitor of white faces being G. H. Church. On May 3, 1869, The Rocky Mountain News mentioned that Church had "a fine herd of American cattle," including a number of purebred Herefords brought from Canada. The

News urged him to bring these animals to the Agricultural Society fair that fall and Church did so, his exhibit including a bull, Northern Prince, and three cows listed as Indian Rose, Nutty and Otsego. One of these cows was the daughter of "a celebrated bull, Berwick, owned by Lord Berwick in England."

MILLER DISSEMINATES THE BLOOD.—Dissemination of Hereford blood began actively with the sale in 1873 of five registered bulls by T. L. Miller, the noted pioneer breeder of Beecher, Illinois. He sold three of them to George Zweck of Longmont for \$1,250 and the other two went to the Powell Ranch near Canon City for \$900. Miller went back to Illinois after more Herefords, selling this second lot to P. P. Wilcox, George F. Lord, and others, the list of early Hereford owners in Colorado including Culver and Maloney of Big Thompson, the Church Ranch near Denver, W. E. James and Theodore White of Estes Park, J. W. Iloff, John H. Hittson and J. W. Prowers. A shipment of three-year-old Hereford steers went from grass on the Church Ranch to Buffalo, New York, in 1874, bringing seven cents a pound live weight, around ninety dollars a head.

As far as is known, J. W. Prowers, the "cattle king" of the Arkansas Valley had the first Hereford breeding cows in Southern Colorado, having started a small herd in 1876 on his home ranch at Las Animas.

The LC herd on the Baca Grant in the San Luis Valley, founded by George H. Adams, was established in 1880, with Herefords said to have been imported from England. However, the first calves from this herd in the American herd book were not recorded until 1890.

OTHER BEEF BREEDS.—Other beef breeds are represented in Colorado by good blood lines, though Herefords and Shorthorns predominate, with the whitefaces far in the lead on the range, as to numbers of cattle. The records of the American Hereford Cattle Breeders' Association show 182 breeders of whitefaces in Colorado in 1926. The American Shorthorn Breeders' Association records show 377 applications for pedigree from Colorado for 1926, though there are 680 Shorthorn breeders listed in the state. The Shorthorns are widely distributed in small farm herds. Aberdeen-Angus and Galloway cattle are represented by a few herds and there are many of the dual-purpose Milking Shorthorn breed, popular because of their ability to produce both beef and milk.

THESE LATTER DAYS

The final chapter in the story of the range livestock industry is still to be written for areas in the Rocky Mountains, suitable for grazing will be available as long as there are farm animals to utilize the grass. However, free range is a thing of the past. Regulation and conservation are

a settled rule; pasture rotation is practiced, some areas being allowed to reseed by natural process, while the animals are pastured elsewhere. No one would wish for the return of the old days of free use and abuse of the grass.

Factors which have aided in the great economic changes in the industry include development of the central livestock market and packing houses at Denver, establishment of the National Western Stock Show, with its educational influence for better livestock, the animal investigations work, experimental tests, veterinary research and scientific breeding and feeding of farm animals at the State Experiment Station. The combined influence of these educational and business forces, plus grazing conservation work of the United States Forest Service, has helped to shape the industry to meet modern conditions. Without these forces and their insistence on thrift and economy of management, there would be little left to say about grass and its sustenance of sheep and cattle in the mountains of Colorado. With them, it has been possible to salvage the remnant left by prodigal misuse of a natural resource and to again build up on nature's bounty with permanence for the remaining range users.

NATIONAL WESTERN STOCK SHOW

While the National Western Stock Show was not started until 1905, its fore-runner, the National Exhibition of Range Cattle, was held in Denver, January 24, 25, 26, 1899. This was one of the few shows ever held in which only range cattle were exhibited. No breeding cattle were shown, the classifications being yearling and two-year-old steers and calves, in two divisions—northern and southern. The show was an attraction arranged simultaneously with the second annual session of the National Livestock Association. Herefords took most of the awards; in fact, the charge was made that the judges were biased in favor of that breed. These judges were David Rankin of Tarkio, Mo., known in his time as the largest finisher of beef in the world; T. B. Hord, Central City, Nebr.; Peter Hopley, Atlantic, Iowa; Tom Mortimer, Madison, Nebr.; Casper Beatman, Atlantic, Iowa.

Sweepstakes for best load of calves in either division went to Chambers & Whitney of Evanston, Wyo., while first prize for best load of northern calves went to Newcomb & West of La Jara, Colo., their cattle being Polled Angus, the only blue ribbon herd in the show that was not of the Hereford breed.

STOCK SHOW STARTS 1905.—No other exclusive range show was held in the state, but the Western Stock Show, as it was then called, formally opened its long career in January, 1905. The classification lists of this

show have from the start included feeder cattle, the commercial product of the range; bulls in car lots for range use, the show being unique in these two classes, with the largest feeder show held anywhere. Breeding cattle of beef and dairy classes, sheep, hogs, poultry in all classifications, are a part of the exhibition, as at other great livestock shows. In late years the National Western has eclipsed the International show at Chicago in several classes, both in numbers exhibited and in quality. Judges of breeding cattle are chosen with reference to their international standing, and, in all respects, the exhibition is of world-wide note in its relation to the livestock industry. Its foundation was and still is the grazing industry, other features having been added as the West developed in farm livestock, in intensive agriculture, and in breeding practices.

The organizers of the show were: Jose P. Adams, Fred P. Johnson, William M. Springer, Harry Petrie, L. F. Twitchell, A. J. Champion, John H. Fesler, C. E. Stubbs, J. F. Vallery, E. Bosserman, Gordon Jones, W. L. Carlyle, John Grattan, I. N. Moberly, Clyde B. Stevens, E. M. Ammons and F. W. Boot.

AMMONS FIRST PRESIDENT.—E. M. Ammons was its first president and he retained that office until the year of his death, 1925, in recognition of his services in influencing the range industry, through persistent educational processes, to meet the new conditions. While he first publicly suggested and sponsored the show, the man behind him and who gave his utterances to the world, was the late Fred P. Johnson, founder and publisher of the Denver Daily Record Stockman, which publication has had a large part in guiding the industry from the haphazard and wasteful methods of other days to the present economically sound and conservative business practices.

The present officers of the Stock Show Association are: W. L. Petrikin, president; W. N. W. Blayney, first vice-president; John E. Painter, second vice-president; H. L. Youngerman, general manager; R. R. Boyce, secretary.

\$8,000,000 IN ONE WEEK.—An impressive detail that emphasizes the difference between the old days of the range and the modern is the fact that one week's turnover in livestock, which reaches its high point for the year during the National Western Show, runs up approximately to eight million dollars, which is in excess of an entire year's business in the early period of the range industry.

DEVELOPMENT OF STOCK YARDS

The annual exhibition brings this development to public attention, but the market place witnesses the transactions. From Joe Bailey's Bull's Head

Corral in the early sixties to the Denver Union Stockyards of 1926 is a far cry, but the transition, however, great, is easily traced. Bailey's market place was what its name indicates, a stock yard where cattle were held for transfer to the butchers of Denver and the near-by mining camps. This yard was located on Wazee Street, between Sixteenth and Seventeenth, the present site of the Denver Union Station and terminal tracks. As the town grew other yards were built at Broadway and Cherry Creek, in the early seventies, and later they were crowded out to Thirty-fifth and Wazee Streets, the present site of the Colorado Iron Works. This was the first place in Denver where cattle were unloaded directly from railroad cars into the yards.

FIRST LOAD OVER DIVIDE.—Up to that time it was necessary to make a drive from the railroad yards with cattle that came to Denver by rail, as related by William Boot, who was a pioneer cowman in the Ute country on the Western Slope. Boot was the first to ship a load of cattle by rail over the Continental Divide at Marshall Pass, this being in 1873. He had to trail the cattle a hundred miles to Gunnison, coming from what is now Montrose County, Gunnison being then the terminus of the Marshall Pass line. On reaching Denver the cattle had to be unloaded at Burnham Junction and driven to the stock yard on Cherry Creek, at Broadway, where each shipper or drover sold his own cattle. Boot sold his load to Frank Aicher, who had abattoirs and meat shops at Denver and Central City.

The next extension of city limits from Thirty-fifth Street forced the yards to a point a quarter of a mile south of their present location, which was soon outgrown. John Clough, a cattle dealer, had become interested in the yards by this time, purchasing ground from J. Farley on the present site and putting up pens along the banks of the Platte in 1880. The first incorporation of the stock yards took place in 1881 under the name of Denver Union Stock Yard Company, by John A. Clough, Jacob Scherrer, F. P. Ernest, J. A. Cooper, J. M. Wilson, William B. Mills and Samuel E. Wetzel. In 1885 the yards were taken over by the Kansas City Stock Yards Company and re-incorporated as the Denver Union Stock Yard Company. Business grew slowly with the transition from trailing to railroad shipment.

Changes in ownership and management came with the development of business until the climax was reached in the establishment of branches by Armour and Swift and the subsequent enlargement of locally-owned plants, all of which, however, is rather industrial than agricultural. Comparative figures throw the best sidelight on growth of the livestock industry. In 1915, which was, up to that time, the largest business year in the history

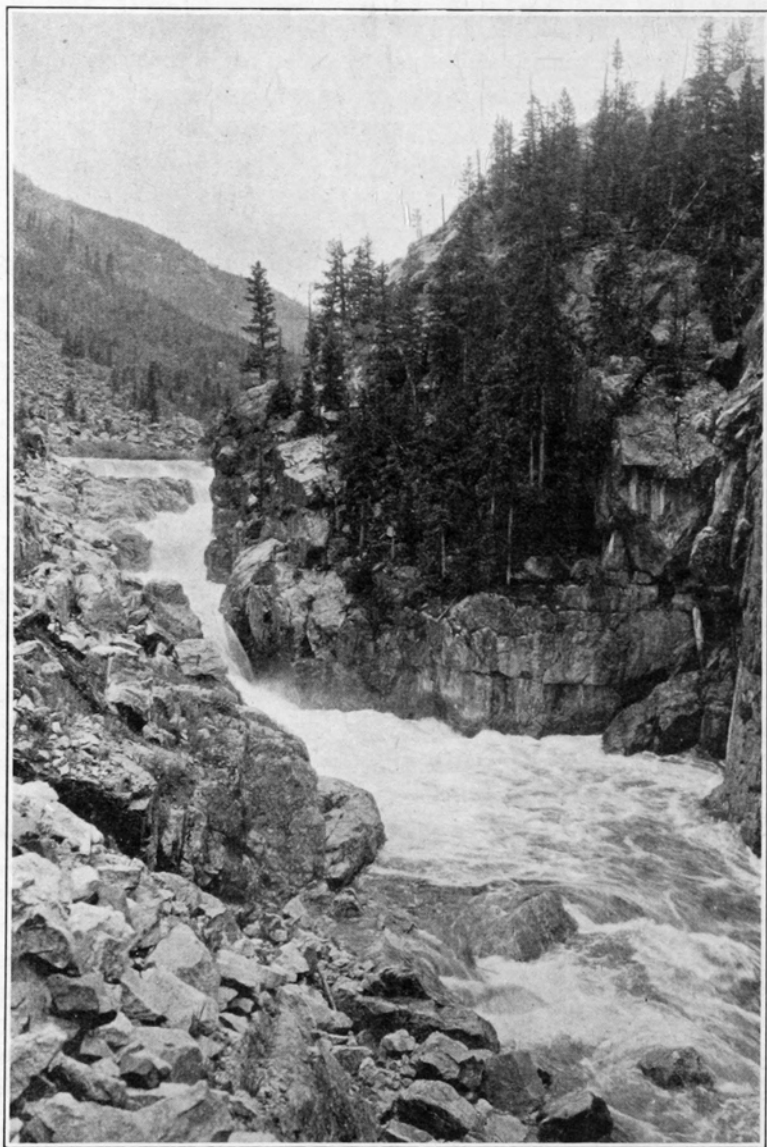
of the Denver market, total receipts at the Denver yards were 1,605,034 head. In 1925 the receipts totaled 3,455,183 head, an increase of more than 100 per cent in a decade. In 1925 receipts were valued at \$60,000,000. This figure, though inclusive of adjoining states, again illustrates the difference between the spectacular days of the range, when there was much more dust and excitement, and today, when transactions are measured in real dollars instead of romance.

POST-WAR DEPRESSION

Deflation at the close of the war hit the range industry a body blow. There was a general breakdown of the agricultural industry in the United States, but no branch was hit harder than that which deals with farm animals. It was estimated in 1921 that fifty million dollars had been squeezed out of livestock values in twelve months in Colorado, this including not only range stock, but also the steers and lambs in the feedlots, the beef and dairy animals on farms, and the hogs. At the beginning of 1921 the number of range cattle in Colorado was estimated at 1,289,670, while the number a year before was 1,320,000.

With beef continuing on the luxury list through high retail prices, there came wage reductions and unemployment, withdrawals of credits, shrinkage in the value of collateral, deflation severely criticized by stockmen as untimely and unnecessarily sudden; a combination of circumstances playing havoc with demand and sending the cattle supply to a stagnant market. For the sheepman the story was little better. He experienced a sharp drop in wool, while the consumer still was taxed exorbitantly for clothing made from shoddy.

Lamb feeders had their hope of profits blasted by shipments of frozen lamb from Australia and New Zealand, with which the British Government swamped American seaports. No such economic upset had ever come upon the industry, and there was no way of quick relief. The whole machinery of production had been centralized and subsidized to war needs at war prices and when peace came in France the artificial structure crumbled and in its wake went banks, farms and ranches into bankruptcy. The only saving feature was that the land remained, though often in other hands than those who had farmed it. Upon this asset, which retained its intrinsic worth, a new agriculture has been built up, and along with it the livestock industry has recovered, being in this latter day more and more a part of general farming, for even the mountain ranchman grows hay and feed for the winter and demands of the grass only the seasonal use nature intended it to give.



Rapids of the Cache-la-Poudre River, source of waters that irrigate one of America's richest farming valleys.

CHAPTER VI

Mythical Great American Desert Vanishes When Irrigation Begins

THE BEGINNING OF IRRIGATION

Irrigation for the production of crops in the arid region of southwest America is older than the written history of this continent. The record of beginnings may be read only by the archæologist in uncovering the ruins of civilizations that vanished before the coming of the Conquistadores from Spain. Europe was emerging from the stagnant Middle Ages of a flat world, without knowledge of the thriving civilization westward across the seas, where copper-skinned farmers, skilled in masonry, were building dams and canals and constructing stone terraces to hold the soil over which water trickled by gravity to aid nature in growing grain for food. Storehouses were constructed to hold the surplus grown in years when rainfall and stream flow assured a plentiful yield against the season of drouth, inevitable then as now under a climate that has not changed appreciably for a thousand years.

Where the aborigines left off, Spanish colonists, following in the wake of explorers up the Rio Grande, took possession of valley lands, expanded the fields, altered somewhat the methods of irrigation, and continued crop production. Climatic limitations made attempts to grow crops without artificial watering almost useless. The Spanish population has varied through the three centuries since the first invasion of New Mexico, but it has long exceeded that of the Indians, who are now comparatively few in number and of little consequence economically, though once the sole possessors of the land which they farmed with the aid of irrigation for hundreds of years.

These facts about New Mexico's farming are stated at the outset in introducing Colorado's irrigation history, so that the reader may gain the proper perspective and not be bound by the narrow vision which dates beginnings with the arrival in the Rocky Mountain region of settlers from the eastern states. It has long been customary to give the Mormon pioneers in Utah credit for establishing what has been termed "modern irrigation in America" and even to go further and, as in the Utah chapter in the *Encyclopedia Britannica* (11th edition), to convey the idea that irrigation

in the arid United States started with them. To quote the Encyclopedia: "Irrigation of the arid western regions of the United States began in the Great Basin of Utah when the Mormon pioneers in 1847 diverted the waters of City Creek upon the parched soil of Salt Lake Valley."

BACK TO THE RUINS.—That claim is correct only if California, Arizona and New Mexico are to be eliminated and if Spanish settlement antedating Plymouth Rock, and the semi-civilized communal life of the Pueblo Indians, going to remote antiquity, are to be ignored. Any consideration of the development of human activities in southwest America that aims to be more than superficial must go back beyond the gold discoveries in the Pike's Peak region of 1858, beyond the rush of the Argonauts to California in 1849, beyond the pilgrimage of the Mormons to their promised land in 1847, beyond the settlement of the Oregon country, and even farther back than the coming of the Spaniards in the sixteenth century, back to the ruins for the true story of how life has been supported in southwest America, not for generations or centuries, but for ages. While the present volume deals only with the modern agricultural development of one political subdivision, it is necessary, for a full understanding, to suggest in a brief way what has gone before, so that the student interested in pursuing the subject to its source may not be misled into thinking of irrigation farming on this continent as a modern development.

THE FARMER MODERN, NOT IRRIGATION

As to the definition of modern, when applied to irrigation—that is a relative term. It is the farmer that is modern, not the practice of irrigation. To recent generations of western farmers, whose experience and ancestry go back to regions of ample rainfall, irrigation is new and modern. As an example of the extent of irrigation by early Spanish farmers in the valley of the Rio Grande, reference is made to a document in the Pinart Collection quoted by H. H. Bancroft in his "History of Arizona and New Mexico":*

El Paso was famous for its vineyards and orchards; and except the raids of hostile gentiles, its chief concern was about its irrigating ditches and the dam of the Rio del Norte, which supplied them. This dam was usually carried away by the floods of May-July. A document in the Pinart Collection shows the constant but futile efforts of the authorities in '54-'62 (1754-62) to collect a special tax of fifty cents on each one hundred vines to build a solid dam. There were 250,000 vines, but the owners declared that they were too poor to pay the tax, either in money or work.

There may be a disposition to minimize the irrigation works and practices of the aborigines now referred to in the general term as Pueblo Indians, but even here the student will find cause for wonder and admiration. Only a slight knowledge of archæological research in the Southwest

*Bancroft, Volume XVII, p. 281. (El Paso as here mentioned, was a district of considerable area including among others the Socorro and Isleta settlements.)

is sufficient to convince one that these so-called prehistoric races could have existed and thrived only through extensive use of water for irrigation. Generation after generation occupied the dwellings which are being uncovered through excavations on the level ground, or found under the overhanging cliffs in the canons of the Mesa Verde in southwest Colorado and in other localities in the adjoining states of Utah, Arizona and New Mexico. No one can see these ancient abodes and examine ruins of terraces, dams and canals without reaching the conclusion that these people, semi-civilized when measured by our standards, were an agricultural people and that their descendants found today in the villages of the Zuni and Moqui are a decadent remnant whose practice of agriculture is but a feeble reminder of that found in the days before the Spanish conquest.

JEANCON'S EXPLORATIONS.—That this is not mere speculation is attested by such authorities as Mr. J. A. Jeancon, Curator of Archæology of



This illustration shows the spring above the Pueblo of Mishognovi, Arizona, where water originates to irrigate terraces shown in the next following illustration. These Hopi Indian irrigation works in modern use are the counterpart of ancient construction being uncovered in the sands of the southwestern deserts.

of grain and vegetables. Concerning these explorations made on the Lobato Grant Mr. Jeancon writes:

Nearly a quarter of a mile to the northwest on the right bank of the Rio Oso were the fields of the Pesede-Uinge. These were from 600 to 1,000 feet long and from 200 to 300 feet wide. Walls were built across them, forming terraces, and the ditches still remain in fairly good condition. There are indications of dwellings on this side of the river, but we were not able to determine any outlines. * * *

the Colorado State Historical and Natural History Society, whose contributions to archæological lore while on the staff of the Smithsonian Institute at Washington added much to the knowledge of America's past. In 1910 Mr. Jeancon made explorations in the Chama Basin, New Mexico, and his account of that work is given in the magazine, "Records of the Past," Volume X, March-April, 1911. Only brief quotations are here given to indicate that there is proof for the statement that the ancient Pueblo Indians did not merely have terraced gardens, but that they supported themselves from fields

The fields north and west of Pesede-Uinge are remarkable examples of pre-historic agricultural works. The curious thing about the ditches is that they seem to end at the western line of the fields, at an elevation about twenty feet higher than the eastern and all of 25 feet above the river bed. Whether the ditch ran on farther west or not we did not have time to determine. If it extended west to the river, which is more than probable, as that would be the only way that water could be run into it, the builders would have to go a long way, as the fall in the river is comparatively slight at this place.

These irrigation works were probably built between 1200 and 1400 A. D., according to Jeancon. The grant was secured by the Lobato family some time in 1700 from the Spanish crown, and these Spanish settlers used the ditches for growing crops. This example might be multiplied by a thousand, as each communal ruin on the mesas or under overhanging cliffs once was a hive of human activity as populous as the supply of food would sustain.

SPANISH COLONISTS STARTED IN 1598.—While much must be left to conjecture in discussing Indian irrigation practice, there are authentic records as to the Spanish colonists from 1598 to the time when settlement in Colorado began. The first court decrees for irrigation rights in Colorado streams were granted to Spanish-American users in 1852, five years after the first Mormons arrived in the Salt Lake Valley. While the Mormons were without previous experience in the use of water on crops, the early Spanish-American farmers who settled on what later became Colorado soil had long been accustomed to irrigation in the Taos country from which they came. In fact, the ancestors of these Colorado colonists came from a country where irrigation was practiced extensively at the time the first Spanish explorers crossed the Atlantic to the new world.



Terraces at Mishognovi

Irrigation in Spain goes back to the invasion of the Moors, who brought the practice from Africa about the tenth century. The great dam that spans the gorge of the River Monegre at Alicante was built in 1579, and even in modern days this would be no inconsiderable project, the masonry dam as constructed in what now seems a remote century being 140 feet high and impounding 130 million cubic feet of water that irrigates 90,000 acres of land. So it

is not surprising that the Spanish colonists in Old and New Mexico appropriated the irrigation systems of the Pueblo Indians, and that they built dams in the Rio Grande del Norte, and that the authorities in 1754, as already indicated, should have desired a masonry dam to replace the crib dam which was constantly being undermined and washed out by the floods. To these Spaniards irrigation works were not a novelty as they were to Brigham Young's pilgrims in the Salt Lake Valley, or to the Colorado Pike's Peakers in '58 and '59. The evidence could be piled up, but let a few extracts from New Mexico's irrigation history suffice, to lead those who desire to pursue the subject back to sources that are authentic.

GREW CORN, WHEAT AND BEANS.—H. H. Bancroft, in Volume XVII, Arizona and New Mexico, discussing the period of 1750 to 1800, says:

New Mexican industries were agriculture, stock raising and barter. There was no mining, though occasional indications of mineral wealth were found. Manufactures, beyond the preparation of skins, for home use or a southern market, the weaving of cotton in small quantities at a few pueblos and the making of pottery at others, were confined to the fabrication of coarse woolen blankets by the Pueblo Indians. Agricultural products, chiefly from irrigated lands, were maize, wheat and beans in the north, or New Mexico proper, with a little cotton, fruits for home consumption and an inferior species of tobacco, known as punche, while the southern district of El Paso was famous for its fruit orchards, vineyards, wine and aguardiente.* Of livestock, sheep forms the chief element, these animals being raised in large numbers, both for their wool and meat, though there are no reliable statistics extant. Horses and cattle were also raised, but the former were always scarce in the province on account of the numbers sold to and stolen by the wild Indians. I find no definite indications that cattle were raised to any great extent for their hides and tallow. But all was subordinate to the commercial industry and all trade was cambalache, or barter. Each year in July or August the people met the Comanches and other tribes of the plains at Taos, where a grand fair was held. Some trade was done at other frontier points, and also by citizens and Pueblo Indians, who went out in various directions to meet customers, but this was discouraged and at times forbidden. To this fair the wandering gentiles brought skins of deer and buffalo, with Indian captives to barter for knives and other iron implements, horses, beads and trinkets and to some extent, blankets. At the end of the year the New Mexicans went in caravans, sometimes of 500 men, to attend the January fair at Chihuahua, where they exchanged the skins, Indian servants, blankets and to slight extent other products of the province for cloths, groceries and various articles for the year's Indian trade. The value of each year's exports was estimated by the Comandante General in 1788 at \$30,000. * * * There was no trade as yet with the French in Louisiana or with the Spaniards in Texas. * * *

The population in 1750 has been given as 3,779 Spaniards and 12,142 Pueblo Indians, a total of 15,921 in New Mexico proper, or 18,721, including the district of El Paso. In 1760, official reports show that the number of Spaniards had increased to 7,666. * * * Down to 1788 there was slight change in the figures, but in the final decade there was an inexplicable doubling of the Spanish population; and at the end of the century the figures stood as follows: Spaniards, including, of course, the castas or negroes and mixed breeds, 18,826; Indians, 9,732; total, 28,558; or, including El Paso, 34,138.

*Aguardiente, frequently mentioned as a product of the vineyards of the Spanish colonists of New Mexico and California, is a grape brandy. Amado Chavez, of Cowles, N. M., writing to Chester A. Lee of Colorado, in response to a question for this history, tells of the way in which his grandfather, Don Pablo Labadie, used to make aguardiente that was "so fine it became famous all over the province. It was bought by people all the way from El Paso to Taos. He used to make good wine, but the grapes that he used to make aguardiente he left on the vines until they were very ripe and was so careful about that, that every bunch would be examined very carefully and every green grape would be cut and thrown away. The grapes that are on the vine after the first frost are the sweetest."

Coming down to a later period, the beginning of the nineteenth century:

There were no new developments in agricultural industries. Products in New Mexico proper were wholly consumed at home, and irrigation generally protected the inhabitants against drouth, as in 1803 and in 1820-2; and the Indians, as far as possible, tried to follow their old custom of storing the products of plentiful harvests, though the improvident settlers were sometimes caught napping and suffered from scarcity. All reports praise the agricultural and especially the stock raising, advantages of the province under proper encouragement.—(Bancroft, Vol. XVII, Arizona and New Mexico, p. 302.)

SANTA FE TRAIL COMMERCE.—Bancroft's chief source of information on the traffic over the Santa Fe Trail was Josiah Gregg's "Commerce of the Prairies; or, The Journal of a Santa Fe Trader, During Eight Expeditions Across the Great Western Prairies, and a Residence of Nearly Nine Years in Northern Mexico."

This volume contained a tabulation of the commerce from 1822 to 1844, showing the value of the merchandise carried each year beginning with \$15,000 in 1822 and reaching its highest figure in 1844, namely \$450,000, in which season there were engaged 230 wagons, 350 men and 30 traders. Another authority quoted is David Waldo in Farnham's Mexico, whose figures are for 1846, showing \$937,500 as the cost of goods transported by 375 wagons, using 1,700 mules and 2,000 oxen as draft animals with 500 men in charge.



Terraces at Hotavilla, Hopi Pueblo.

Another authority on the extent and nature of irrigation in the vicinity of Taos is the Journal of Dr. Willard, covering the period of 1825 to 1827, during which the author was at Taos, Santa Fe and Chihuahua. He writes: "All cultivation is carried on only by artificial irrigation; and it seems wonderful how Providence has adapted a country which could produce but few of the edible cerealia without it for irrigation. Where the soil is fertile it will naturally be imagined how delightful and luxuriant those fields and gardens will be when the owners can command just as frequent waterings as they choose."*

*Dr. Willard's Journal was first published in the Western Monthly Trade Review, April and May, 1829, and is now available in the book, "Early Western Travels," compiled and edited from notes by Reuben Gold Thwaites, LL.D.

Commerce followed the Arkansas River along what was the northern border of the Spanish country, the traffic accounting for early attempts at farming in what is now southeastern Colorado and for other influences on the state's development. The border line of the older civilization is well defined and it remained practically unchanged throughout three centuries, though there were attempts to start settlements here and there south of the Arkansas in what is now Colorado. Ruins are found of plazas, straight rows of cedars undoubtedly planted by the hand of man, remnants of adobe walls and other evidences of Spanish settlements, one such being near the village of Higbee on the Purgatoire in Otero County. No one has any definite knowledge of the age of the ruin at that point, but old settlers believe it antedates the Santa Fe Trail.

RICHARDSON DESCRIBES SETTLEMENTS.—An early-day traveler has left a record of a visit to the old Spanish-American community whose people were the first appropriators of water from feeders of the Rio Grande in what is now Colorado. This traveler was Albert D. Richardson, author of "Beyond the Mississippi," a volume which covers the period from 1857 to 1867 and includes his journeys through Kansas, Colorado and New Mexico. In the fall of 1859 Richardson left Taos for Denver, having been directed by Kit Carson to follow the trail which led up along the Rio Grande to the western side of La Veta Pass. His first view of the Spanish-American settlements in the lower end of the San Luis Valley is recorded as follows:

"Soon after sunrise I rode among the scattered ranches, with valley fields of corn and wheat. Irrigation makes the parched, sandy soil wonderfully productive. In most wheat-growing states a yield of fifteen fold from the seed is an excellent crop. But this seeming desert often produces fifty-fold and sometimes a hundred-fold. It is not adapted to Indian corn on account of the cold nights. In winter farmers do not feed stock; the cattle subsist upon a wild sage, so tall that it is seldom hidden by the snow.

"Crossing the Costilla River, I dined at the trading house of Mr. Posthoff, a German resident of gentlemanly manners and liberal culture, with whom I spent an agreeable afternoon and night.

"Nearby was a Mexican grist mill * * * It is simply a horizontal water wheel, connected by an upright shaft with the millstone one story above. The stone revolving no faster than the wheel, grinds but slowly, and having no bolting apparatus, turns out very coarse flour. There are a few improved steam mills in the territory. * * * Day's travel, 21 miles.

(The following day):

"At last from a hilltop I had a dim, shadowlike view of Fort Garland far below, its adobe walls dotting the fair valley of the creek, fringed with

cottonwoods and the Stars and Stripes floating over it. Late in the cold evening I reached it, after a day's journey of 33 miles. The post sutler, Mr. Francisco, was far-famed for his hospitality. Around his cheerful fire I found several gentlemen who brought the latest word of old comrades and new mines in the gold region."

On October 13, 1859, Colonel Ceran St. Vrain arrived at Denver at the head of a train of twenty-six ox wagons laden with 1,100 sacks of flour, 100 sacks of corn and other supplies from Taos. The same freighter brought a second load during January, 1860, including 1,000 sacks of flour which, according to the chronicler of the news of the day, "was made from Mexican wheat and sells for \$16 per hundredweight in Auraria."*

This flour was made from wheat watered by ditches out of the Rio Grande and its tributaries in the Taos country and in the San Luis Valley.

STILL USED ANCIENT IMPLEMENTS.—Farming did not advance under Spanish-American rule in the Southwest. The crude implements used in the remote years when the first settlers followed the explorers from Mexico northward, were still in use by the emigrants who settled at San Luis and Guadalupe. Plows were made of pinon timber with a spruce pole for a beam, to which oxen were yoked. Grain was sowed by hand and plowed under. Goats trod out the grain on the threshing floor. Such primitive methods have not yet been discarded in some parts of the Southwest, though most of the Mexican farmers of Colorado are now using modern implements and following the methods of their Anglo-Saxon neighbors. For over three centuries these people were isolated, and while landed proprietors kept pace with the advancing culture of the Spanish-speaking world, the laborers who tilled the land and herded the flocks continued to produce food with the same implements and by the same methods in use when Ferdinand and Isabella ruled Spain. It was only through the cultural influences of the minority of the better class of Spanish-Americans that complete stagnation was prevented. While the ruling class were often guilty of oppression and the lower class Mexicans were held at times in virtual slavery, the blood of the white race is dominant, and a half century of contact with American educational influences has revived the spark and given the Mexican people a place of economic importance in our agricultural system.

While irrigation development along the Platte and its tributaries proceeded independently of these Spanish influences, it was known to the American settlers in middle and northern Colorado that their supply of flour had been augmented from southern sources, from wheat grown under irrigation. In southern Colorado, Spanish-speaking settlers could be found here and there along the Huerfano, the Cucharas, the Purgatoire, using

*Rocky Mountain News, Jan. 25, 1860.

water for small patches of cultivated land. These were on the frontier of the long-established New Mexican settlements. These ranches were in existence before the Pike's Peak gold discoveries, dating back to the years of traffic over the Santa Fe Trail.

HATCHER FARMED IN 1846

There is also record of an American farmer who watered crops from the Purgatoire before that stream was in United States territory, this being John Hatcher, who settled at Hole-in-the-Prairie in 1846.

Hatcher was employed by Colonel St. Vrain freighting over the Santa Fe Trail. In the spring of 1846 he left the outfit and decided to stake out a claim in the valley of the Purgatoire east of the present town of Trinidad. The location was at what was known as Hole-in-the-Prairie. With the aid of some Mexicans from Taos he broke out a ditch, prepared his ground and planted corn. A party of Cimarron Utes watched the proceeding and told Hatcher he was on Indian land and would have to vacate. He paid no attention to their warning, and they did not disturb him until his corn was ready to tassel during August. Then they tore the corn out of the ground and drove Hatcher and his family from the place, running off his cattle and leaving him only an ox and an old mule. He hitched up this odd team to a cart and drove away to seek a new location.

In 1866 John W. Llewellyn, a freighter from Trinidad, relocated the Hatcher claim under the homestead law. He proved up in 1872 and sold the place to Senator S. W. DeBusk of Las Animas County. In 1881 the owners of irrigated lands in that locality took steps to prove up on their ditches. At that time DeBusk learned from William R. Walker that he was living on the identical farm located in 1846 by Hatcher. A witness was found named Calvin Jones, through whose testimony DeBusk established his right to the water. Jones testified before the referee that in the autumn of 1846, while on the way from the Huerfano to the Purgatoire, he passed the place where Hatcher was at work building the ditch. The ditch was laid out to cover all the first bottom land, the outline following the contour of high ground bordering the valley. Months afterwards Jones met Hatcher along the road to the Huerfano settlements. He was traveling in a two-wheeled cart drawn by a mule and an ox. He told Jones the Indians had driven him out, having destroyed his crop and his implements and threatened to kill him if he did not leave immediately.

Hatcher was heard of again in 1852, when he was a partner of Joseph Pley in the freighting business in old Mora Town in New Mexico.

JANIS TOOK CLAIM IN 1844

The first permanent white settler in northern Colorado was Antoine Janis, who staked out a squatter's claim in 1844 on the Cache la Poudre at a point later known as LaPorte. He kept that claim until 1878 and was well known to the pioneers of Colona, the town which was the predecessor of La Porte, as well as to later arrivals. It is not known in what year Janis took up permanent residence on his claim, as he was engaged in scouting, with headquarters at Fort Laramie for some years after staking out the claim. Janis supported himself from the land and used water from the Cache la Poudre to irrigate his crops. Before he settled there French trappers had been making this spot a camping ground. Authentic information, obtained from Philip Covington, father of H. C. Covington, long a resident of La Porte, indicates that these trappers made a rendezvous there as early as 1828. In that year Philip Covington, then a boy, was one of a party of American Fur Company trappers who crossed the Cache la Poudre at La Porte on the way to Oregon.

Janis, at the age of twelve, in 1836 accompanied his father on a trip from St. Louis to Green River with a trapper's caravan, passing through the Cache la Poudre Valley at the spot where eight years later he staked out his claim. Janis took a squaw wife and, joining a band of Arapahoes comprising 150 lodges, came to the Poudre in 1844.

A LETTER FROM JANIS.—Ansel Watrous, author of the History of Larimer County, attempted to get more details from Janis after the latter moved to the Pine Ridge Agency in 1878. Janis wrote Watrous, under date of March 17, 1883, saying: "On the first of June, 1844, I stuck my stake on a claim in the valley, intending the location selected for my home should the country ever be settled. At that time the streams were all very high and the valley black with buffalo. As far as the eye could reach nothing scarcely could be seen but buffalo. * * * Soon after locating my claim, I moved over from Fort Laramie and settled on it. The place is just above La Porte and is owned by Tobe Miller. One hundred and fifty lodges of Arapahoes moved there with me at the same time. They asked me if I wanted to settle there. I told them I did. Bold Wolf, the chief, then called a council of braves, who finally gave us permission to locate and donated to us all the land from the foot of the mountains to the mouth of Box Elder Creek. The donees were E. Gerry, Nicholas Janis and myself. In the winter of 1858 and '59 settlers commenced flocking in. A company was formed, composed of Nicholas Janis, E. Gerry, Todd Randall, Raymond B. Goodwin, John B. Provost, Oliver Morissette, A. Le Bon, Ravofiere and others, which located the townsite and called it Colona. We had the site surveyed and mapped out and built fifty houses."

Colona at one time aspired to be seat of the territorial government. In 1862 the name was changed to La Porte. The original Colona settlers all took up land and grew crops by irrigation from the Cache la Poudre.

MODENA TAKES A CLAIM.—In 1858 Mariana Modena, a Mexican, staked out a squatter's claim on the Big Thompson about three miles west of the present town of Loveland. The settlement he started later became known as Namaqua* An Overland stage station was established near by in 1862. Modena raised cattle and horses and did some farming. Other settlers who came in 1860 were William A. Bean, John J. Ryan, John Hahn, J. N. Hollowell, Judge W. B. Osborn, Thomas H. Johnson and W. C. Stover, all of whom established farms and used water from the Big Thompson for irrigation.

EARLIEST DECREE DATED 1852

The earliest appropriations of water confirmed by court decrees in Colorado, as has been stated, are in Costilla and Conejos counties. Decree No. 1 in District No. 54, known as the San Luis People's Ditch, dates April 10, 1852. This covers 13.5 second feet of water from the Culebra River. The ditch heads one mile above Culebra bridge in the town of San Luis. At the time the decree was confirmed in 1889, nine hundred acres were watered and the claimants, who were descendants of the first settlers using the water, included Francisco Sanchez, J. M. Salazar, Jose P. Gallegos, Manuel Garduno, Naricisco Garcia, W. S. Parrish, Francisco Garcia, Placicio B. de Gallegos, Noberto Martinez, Gaspar Gallegos, Elutario E. Gallegos, Regino Valdez and 22 others, all residents of the town of San Luis.

Decree No. 2 dates back to April, 1852, no day being named, and is known as the San Pedro Ditch, also taken out of the Culebra near the Chama Church. The claimants were Benerito Valdez and 60 others, all of San Luis and San Pablo.

No. 3 filing is for the Acequia Madre Ditch out of the Costilla River, the year being 1853, no date being fixed. Ferdinand Meyer was the claimant.

Decree No. 4 is for the Montez ditch on the Rita Seco, August, 1853, the claimant being La Sociedad Mutual and the heirs of Juan Locomo and others.

*Namaqua, contrary to general opinion, is not an Indian name, but is of African origin, Great Namaqualand being in Southwest Africa and belonging now to the Union of South Africa. Namaqua is the designation of a long-tailed African pigeon. That Namaqua was named by Mariana Modena, the Mexican squawman who settled on the Big Thompson in 1858 is unlikely, but who gave the place its fanciful name is unknown.

The Vallejo ditch, out of the creek of the same name, is No. 5 in this district. This water was taken out above the Plaze de los Vallejos, and the claimants are Melton Alberts and 15 others of San Pablo.

Decree No. 6 covers the Manzanares ditch out of the Costilla River, April, 1854. This diversion was made in Taos County, New Mexico, near the present state line, the claimants being Fred Meyer and 21 others.

Decree No. 7 is for the Acqueacita on Costilla River, June, 1855, the claimants being Antonio Manzanares and other heads of families in the township of that name.

Next in the order of priority are some of the older ditches in District No. 22, priority Number 1, being Guadalupe Main Ditch out of Conejos River, dating March 1, 1855.

LAFAYETTE HEAD'S DITCH.—Decree No. 2 is for Head's Mill and Irrigation Ditch on the Conejos, dated June 1, 1855, and decreeing 117.14 second feet of water. This was taken out near the Plaza de Guadalupe about one mile north of the present town of Antonito. The claimant was Lafayette Head, at one time an Indian agent, later territorial lieutenant governor and politically prominent during pioneer days in southern Colorado.

Decree No. 3 is for the El Coda ditch on the San Antonio River, dated August 4, 1855. It was taken out one mile below Ortiz. The claimants include A. S. Martinez, J. B. Gallegos, A. Martinez, J. P. Lovato, F. A. Chavez, F. Gallegos, Manuel Gallegos, Martin Gallegos.

Decree No. 4 is for the Llano ditch out of Los Pinos Creek, dated August 20, 1855, the claimants being Pedro Salazar, G. Martinez, B. Lopez, N. Montoyo, J. N. Ortez, F. Salazar, R. Casis and Nestor Durand.

Decree No. 4½ covers the Garcia ditch on the Conejos, and is dated October 1, 1855, the claimants being J. W. and J. A. Garcia.

Decree No. 5 is for the Servietta ditch out of the Conejos River, the date being March 5, 1856, and the claimants Cruz Chavez, J. M. Gallegos, J. I. Martinez, Thomas Martinez, A. de Herrera, A. Rodrigos, D. Montoya, C. Salazar, P. Lopez, Maria A. J. Gallegos and J. F. Chacon. Twelve other decrees are on record in this district, dating to 1856 and 1857.

Priority No. 1 in District 20 is for the El Viego ditch and is dated August 1, 1862. The point of diversion is one mile above Capulin, and the claimants Thomas Trujillo and three others.*

*Hydrographic survey of Rio Grande drainage in the San Luis Valley by James A. French, engineer, U. S. Reclamation Service, 1910 is the source of information on these decrees.

IRRIGATION NEW TO AMERICANS

While the immigrants of Spanish descent in southern Colorado depended mainly on irrigation, those of Anglo-Saxon nativity from the eastern United States, who settled along the Platte and its tributaries, had virtually no knowledge of that form of agriculture. They came from regions where crops were produced under the natural rainfall, and they were unfamiliar with the application of water to plants except only in gardening. It was natural, therefore, that they should have vague, indefinite and mistaken ideas as to the possibilities of farming. Still here and there the records show an individual who was wiser than his day and who dared prophesy of things to come, often with uncanny foresight. So we have an estimate published in *The Rocky Mountain News* of September 17, 1859—at the very beginning of settlement—that 4,544,000 acres of land along the principal streams of the territory were susceptible of cultivation. This unsigned prophecy bore the heading “Resources of the Platte Valley” but discussed also the agricultural possibilities of other valleys. A portion of this early observer’s comment is here given:

RESOURCES OF THE PLATTE VALLEY

“It has been frequently asserted by persons who have visited this part of the public domain, that all that portion of Kansas lying west of the Blue River is a barren waste, upon which nothing would grow; and this is, I am well aware, the opinion of most of the people of the eastern states. Erroneous as this position may be, certainly there are large tracts of land that are barren and which can never be reclaimed to add much to the agricultural resources of the country. These are known as deserts, without water, timber or other growing facility. Such lands are situated east of the valleys of the Rocky Mountain streams and do not occupy, to any extent, the proposed Territory of Jefferson. All lands that have advantages of irrigation are susceptible of cultivation, particularly those that lie near the numerous water courses. There are also fertile spots where cereal crops can be made profitable without irrigating. These localities do not comprehend the alluvial bottoms or table lands of the water of the South Platte or the Arkansas rivers. A large scope of country lying east of the Platte Valley will, in all probability for a long time to come, remain in its present desert state, while, on the other hand, the valleys of the Arkansas, Fontaine qui Bouille, Cherry Creek, Clear Creek and the South Platte, will afford a large area of arable lands sufficient to accommodate and support a population of 300,000. These lands are adapted to the growth of all the cereals except maize, without irrigation, and which mature with more certainty than crops of the same character in the states of Missouri and Illinois.

When attended by irrigation, corn, melons, pumpkins, squashes, onions, cabbage, potatoes, beets, peas, beans, and, in fact, every kind of garden and kitchen vegetable can be raised in great abundance and of a quality that will compare favorably with other parts of the States. The following will show the probable amount of arable land that can be relied on as suitable to agricultural purposes in square miles: The Arkansas Valley, 1,200 square miles; Fontaine qui Bouille, 90 square miles; table lands, 1,200 square miles; Cherry Creek, 120 square miles; Clear Creek, 600 square miles; Valley of the South Platte, 3,200 square miles; Clear Creek, 600 square miles; Cheyenne, 240 square miles; South Park, 400 square miles; valleys and slopes between South and North parks of the mountains, 250 square miles; total, 7,300."

ESTIMATE OF IRRIGABLE LAND.—From this estimate in square miles the writer of the article arrived at his final figure of over four and one-half million acres of cultivable land, to be made productive either through irrigation or, where close to streams, adaptable to the growing of cereals without artificial watering.

Interesting as it is to note the confidence with which the subject was approached by some of the pioneers, there is, on the other hand, a suspicion that this statement was prepared as an argument for the creation of the Territory of Jefferson, and as propaganda for circulation in the states, showing that precious metals were not the only inducement for settlement of the new domain. Nevertheless perusal in the light of the present denotes that its author possessed keen foresight, as well as a knowledge of agriculture.

It was generally taken for granted in the first years of settlement of the Platte Valley that very little water would suffice for maturing crops on soil immediately along the streams and that often no water need be applied in these favorable locations, this opinion being due to the fact that 1859 and 1860 were seasons of ample rainfall and that the first seed in this virgin soil sprang to life eagerly and gave abundant yields. The root crops, such as potatoes and beets, grew to proportions that astonished the newcomers, and where fields or gardens were irrigated the enormous size of the products almost persuaded the first farmers that they had found an agricultural fairyland.

DAVID WALL WAS EXPERIENCED

There was at least one man who knew something about farming by irrigation when he arrived in the Pike's Peak settlement and who came with the fixed purpose of growing crops by that method, and he was David K. Wall. While his arrival at Denver in 1859 directly from South Bend,

Indiana, would not indicate experience in irrigation, the fact was that he had been in California from 1850 to 1854, and had been engaged in providing food for the gold hunters from artificially watered soil. He was, therefore, an experienced irrigator, and it was not chance but design and forethought that made David Wall the leader of systematic irrigation farming in the Platte Valley. However, he was not the only irrigator along Clear Creek or the main stream in 1859.

WALL GRUBSTAKED GREGORY.—It is of interest to record the fact, established by Wall's biography as given to W. B. Vickers in his *History of Denver* (1880) that he grubstaked John Gregory, who discovered the Gregory lode that fixed the status of the new gold country as a permanent field. Wall's service to the commonwealth was therefore doubly important, proving irrigation to be financially profitable and making possible, through furnishing Gregory with supplies, the discovery that removed further doubt about Colorado's gold mining future. The provisions which Wall furnished Gregory were brought from Indiana, another indication that Wall came to Colorado as an outfitter and provisioner of gold seekers.

Wall left home for California in 1850, at which time he was twenty-four years old. He was accompanied by his brother John. They were successful as gold seekers, acquiring enough to start a supply store in a new camp, packing their goods fifty miles on burros. Within eight months they opened a second store in another camp, and with these stores they also carried on a freighting business. In 1852 David Wall crossed the range into Oregon, to the older agricultural settlements, for the purpose of bringing hogs to California, to supply the demand for meat. He bought a drove of two hundred and set out with them for the south. In the mountains a severe snowstorm overtook him and he was compelled to give up the attempt to get over the range. He sold his hogs at a loss on the Oregon side and returned to rejoin his brother after this unsuccessful venture.

In the following spring (1853) Wall and his brother started gardening on the North Fork of the Trinity River, their main crop being potatoes, of which they planted twenty-five acres. They built a ditch two miles long to irrigate the field. Their seed was bought in San Francisco at twenty-five cents a pound. They found the venture profitable, as they got a good crop.

INDIANS ROBBED CABIN.—They narrowly missed losing their cash when Indians entered their cabin from beneath the floor while they were away. The cabin was stripped of blankets and clothing, but fortunately the marauders overlooked a buckskin bag containing \$2,000 in gold. After disposing of their crop of potatoes the Wall brothers decided to return to the old home in Indiana. There they remained until David, learning of the Pike's Peak gold excitement, decided to return west. He crossed the

plains, equipped for the business of farming, bringing implements and garden seeds, including potatoes, which, in his California experience, he had found to be an excellent and easily marketed crop.

On arriving at Denver, he called on William N. Byers of the Rocky Mountain News and told the editor his plans as to farming. He left a supply of seeds with the News for sale, and that fact was advertised to the community in the following paragraph:

"Mr. D. K. Wall of Indiana has left in our office a large supply of garden seed for sale. All ye that wish fresh vegetables walk up and select your packages at 25 cents each."—Rocky Mountain News, May 7, 1859.

Wall then started for the mines and at Arapahoe Flats on the site of what later became Golden, he met John Gregory and outfitted him with provisions which this prospector needed in his search for the source of the gold that was being washed out of the sand in Clear Creek.

WALL STAKES MINING CLAIM.—Wall's first business was to stake out a mining claim. In that he followed the usual course, for all comers were gold seekers, no matter what other occupation they might have had in view. The next step was to lay out a garden that could be easily irrigated from a ditch tapping Clear Creek. Wall then aided in laying out the town of Golden. By that time his brother John had arrived and David made John a partner in the mining claim, the garden and the Golden town lots. William N. Byers visited Wall's "farm" in February, 1860, and he records in *The Rocky Mountain News* of the twenty-second that Wall's receipts from two acres in 1859 amounted to \$2,000.

John Wall died during the late summer of 1860 and that fall, after the crop had been disposed of, Dave Wall went back to Indiana for a short stay. He returned with H. B. Hines, a brother-in-law, with whom he engaged in merchandising, livestock raising, express business and gardening. In 1865 he made another journey across the plains to the old home at South Bend, remaining two years, when he returned to Denver, which then became his permanent home. He established the implement and stage business of Wall & Witter and was prominent in the business affairs of Denver more than twenty-five years. He held only one political office, having been a member of the provisional legislature in 1859.

Wall's prominence in the new community and his success in applying water to crops, as well as his business acumen in selling produce, gave him leadership in agriculture by irrigation. His previous experience in that line in the gold fields of California also contributed to the force of his example among other early irrigators. While he was not the only business farmer who made money out of supplying the wants of the gold seekers,

his example stood out by reason of his own prominence in community affairs.

UTAH'S PLACE IN IRRIGATION

There is no record of Mormon influence in irrigation development in the Platte Valley or elsewhere in Colorado. The early Colorado farmers did not know what the followers of Brigham Young were doing, or had done, in the Salt Lake Valley since 1847. Wall learned in California, where crops had been grown by irrigation long before there were any Mormon settlers in Utah; first by the Franciscan friars at the Missions, and by settlers from Mexico; then by emigrants from the eastern United States who became landed proprietors under the Mexican regime during the first half of the Nineteenth Century. Monterey, Los Angeles, San Diego, Santa Barbara, San Jose and other coast and inland towns had been established as centers of commerce, around which there was agriculture. In most places that meant agriculture by means of irrigation, just as it did in New Mexico. Also, as in Texas where Spanish development along the San Antonio River began early in the eighteenth century.

With the discovery of gold in California in 1848, the rush began, reaching great proportions in 1849 and '50. Colorado, in its gold rush experiences, beginning in 1858, repeated somewhat the experiences of California. The precious metal was found only in localities where the climate was arid. Prospectors and camp followers must have food. There was no mode of transportation except by wagon, and oxen were the chief motive power. Food had to be provided near at hand and thus was irrigation farming developed near the gold camps. In fact, the needs of the miner and the farmer were sometimes provided for by the same sluice or ditch. This was true of the Platte Valley Ditch Company's first canal starting eight or nine miles above Denver.*

ARID CONDITIONS KNOWN.—While irrigation was not necessary everywhere along the Pacific Coast, in Colorado it was assumed that successful farming could not be done without it. The Mormon pilgrims, on their arrival in the Salt Lake Valley, had acted on that assumption in 1847, the aridity being even more pronounced there than in the Platte Valley of Colorado, or in the Pike's Peak region generally. Exploration records of the previous half century, stories of trappers, hunters and adventurers, had brought to the settled regions of the United States knowledge of the "desert country" that intervened between the frontier on the mid-continent rivers and the Pacific Coast. While the rank and file of the emigrant caravans

*Platte Valley Ditch Company, organized July, 1860, supplied placer ground and opened land for farming.—Rocky Mountain News, July 18, 1860.

probably had little conception of the conditions to be met, their leaders were not wholly ignorant on the subject.

It is a tribute to the quality of the Anglo-Saxon spirit of pioneering that the new conditions of climate and soil were so promptly met and mastered, as was the case in California, Utah and Colorado. In justice to Colorado pioneers, however, it must be said that whatever practical examples the Pike's Peakers had in the first years were provided solely by David Wall, who brought his knowledge and experience from California, and others who started farming without experience in irrigation. The pioneers hewed their own way to success just as the Mormons were doing. There was no direct communication agriculturally between the Mormons and the Colorado settlers. The fact is Colorado people were not in a mood to be influenced by anything that came from Utah, because of the attempt of Brigham Young to set up an independent commonwealth, which in 1857, had brought on what is historically known as the "Utah war." These political troubles, still fresh in the public mind, together with the Mormon practice of polygamy, aroused intense prejudice against the people of Utah and their ideas. So, whatever might have been helpful in their irrigation development did not reach Colorado pioneer farmers. There are no circumstances or events in the development of Colorado's agriculture to justify the claim made by Utah for Brigham Young that he was "the founder of modern irrigation in America."

Whatever Brigham Young's contribution, if he made any, to irrigation farming, it was confined to his own state and people. At the time of his death, 1877, Colorado's irrigation development had gone beyond the need of instruction from other western states. The exchange of ideas between western states, which has been mutually helpful, did not come until the experiment stations and agricultural colleges were established.

UTAH'S CLAIMS TOO BROAD.—Before 1880 no western state could say to another: "We did it, we were the founders of modern irrigation in America," and when Utah said it afterward, and still makes its claim in text books that teach irrigation methods and principles, the threads to which the claim is tied are priority in irrigation on the communal plan; or, priority in irrigation by people of Anglo-Saxon stock. On the first claim, the Pueblo Indians have the best of the argument by unknown centuries, the Spanish on the Rio Grande at least since 1750. On the second claim California,* with its politically restless, mixed population of Span-

*Evidence of the extent of agriculture by irrigation in California from 1801 to 1840 may be found in Bancroft's History of California, Vol. XIX and XX, pp. 106, 112, 114, 124, 139, 176, 161 of Vol. XIX. On these pages will be found mention of controversies over water rights, the construction of canals and dams and detailed crop reports at the missions, covering a long period giving quantities and yields of wheat, corn, barley, beans and hemp; also livestock statistics, including cattle, horses, sheep and mules; a record of

ish and Americans in the thirties and forties ante-dates Utah in farming by irrigation.*

FLOUR FROM SALT LAKE.—The only newspaper mention of what the Utah pioneers were doing that reached the Colorado settlements in the early years came in the comment of E. H. N. Patterson, writing under the name of Sniktau in the Rocky Mountain Weekly News of April 10, 1861:

“The flour that Salt Lake trains are bringing us is manufactured from wheat grown upon just such uplands as we have spoken of, and it is a well ascertained fact that our climate is better adapted to hasten the maturity of all cereals than that of the Salt Lake basin. This prophecy of ours may excite a smile with some, but that fact does not detract a whit from the certainty of its fulfillment.”

This was cited by “Sniktau” to confirm his opinion, and that of other observers who realized that the water could be applied to the bench lands. Soil analyses indicated the adaptability of these higher lands to wheat and barley.

ON COMMUNITY PLAN.—Community action in irrigation was common among the Spanish colonists and later among the Californians under Mexican rule. “It is interesting to see how irrigating ditches were managed in the olden time,” says Bancroft.† “Here is a proclamation made by the alcaldes of Los Angeles on the seventh of March, 1841: The time is at hand when the irrigating ditch should be repaired, and due order should be observed in the necessary work: First, the ditch will still be under charge of a man of probity who shall oversee the repairs, keep a list of proprietors of vineyards and cultivated lands which are in the city, and employ the requisite number of laborers. Second, as soon as notice is given by the ditch commissioner, each cultivator shall send an Indian with the necessary implements, and whoever has three riegos must send two Indians—who must not be missing when the day’s work is needed. Third, from among the cultivators two shall be appointed to assist the commissioner in managing the Indians; they must be mounted, and shall be exempt from furnishing Indians. Fourth, the commissioner is to see that the ditch is kept clean and the minor ditches in good order; also that

established agriculture. The Mormons drew on California settlements for livestock and grain in 1847 (Bancroft’s Utah, Vol. XXVI, p. 273.) Following the decline of the missions, agriculture was continued with irrigation by settlers of both Spanish and Anglo-Saxon stock. While not extensive until the latter forties, it was continuous.

*Regulations made by the Mexican Republic for the colonization of its territories, dated August 18, 1828, and applying to California, fixed the maximum of a single grant “at one square league of irrigable land, four of temporal, or land where produce depends on the seasons, and six of land for pasturing and rearing cattle—eleven square leagues (about fifty thousand acres) in all.”—Bayard Taylor’s Travels, Eldorado, Chapter XVIII, p. 187: Old California, Its Missions and Its Lands.

†Bancroft’s Works, Volume XXXIV, California Pastoral, 1769-1848; pp. 355, 356.

fairness be observed in the use of water, which shall not be wasted. Fifth, the commissioner must see that each citizen making use of the water shall have a good stop-gate—which does not leak—at the point where he taps the main ditch.”

Four other provisions were given in Bancroft's translation and the penalties also were specified, for these regulations had the force of law.

THE INDIANS ALSO.—On the point of communal action in irrigation practice among the Pueblo Indians, Jeancon says:

“There were in the Pueblo villages strict laws governing the use of water and apportioning the land. The first man at the head of the communal ditch had the first right to the use of the water, but he could not impound any water not actually in use, and all superfluous water must be permitted to flow back into the communal ditch. All work on the communal ditch was done by the community, and should a man be unable to perform his part he would either have to send a substitute or else pay a fine.”*

A FORTY-SIX ACRE FARM.—Among those who farmed extensively along Clear Creek the second season, 1860, was H. H. McAfee, who was in charge of a 46-acre farm four miles northwest of Denver. This farm was owned by B. McCleery and Company. It was described in the Rocky Mountain News, August 1, 1860, the following quoted from the article being the first published crop report in the Pike's Peak settlements:

The farmers of the country give most encouraging reports of the progress and prospects of all kinds of crops. Planting, in most cases, was done very late through fear of a repetition of the late spring frosts that fell last year. Consequently the seed was just barely in the ground when the seasonable growing weather set in, in June, since which time no climate could have been more propitious for growing crops. But little irrigation has been necessary even on high ground. From H. H. McAfee of the firm of D. McCleery and Company, we have learned some interesting items of his experience this season that, we have no doubt, will apply to most of the farms and gardens in the country. Mr. McAfee has superintendence of their farm on Clear Creek, four miles north of the city. They have planted about forty-six acres in the various crops of wheat, rye, barley, corn, oats, peas, potatoes, broom corn, sorghum and garden vegetables. They planted late and have done no irrigation except to turn water onto their wheat field once through a plowed furrow; but some wagons passing a few hours later broke down the bank of the ditch and diverted the water from its course and the experiment was not repeated. Their crops have been nourished altogether by the rains that have fallen; wheat is nearly matured; the growth was large from the seed and the stalks have attained more than usual height; the heads are the best filled we have seen in any country.

POTATOES WERE PLENTIFUL.—The article contained further information about crops in the new settlement, as follows:

Potatoes are becoming plentiful in market and are of fine quality. Peas and beans have been quite abundant for some time past. Green corn will be ready for use from some fields the last of this week.

*From "Indian Law of Western America," by Jean Allard Jeancon, Curator Archaeology and Ethnology, State Historical and Natural History Society of Colorado. (Page 23, *The Jealous Mistress*, American Bar Association number, July, 1926.)

On August 15, 1860, The Rocky Mountain News records that McAfee called on the editor and left a potato that measured four and one-half inches in length and two and three-quarter inches in diameter. McAfee said it was grown without irrigation. He also brought in a stalk of corn, "almost ten feet high and the tassel is just shooting. His sugar cane and broom corn is over six feet high and promises an abundant crop."

Gardening was given an impetus by McAfee, McCleery and Sons, in the spring of 1860. They were proprietors of Tahosa gardens at McCleery's ranch on Clear Creek, three and one-half miles west of Denver. They advertised for sale 50,000 cabbage plants, 20,000 tomato plants, and 20,000 beet plants, according to an advertisement appearing in The Rocky Mountain Herald of May 12, 1860.

THE WANAMAKER DITCH.—The Wanamaker ditch, the first of record on which a formal filing was made on Clear Creek, was taken out by Jonas F. Wanamaker, who came to Colorado in the spring of 1859. He took up 400 acres of land two miles east of Golden, built the first farm house with a board floor and shingle roof and remained on the ranch till the day of his death, May 11, 1909.

Early planting was the practice, these pioneer farmers having had no previous experience with a climate that changes quickly from winter to summer, without the well-defined spring season of the mid-continent region from which they had emigrated.

BELIEVED WATER UNLIMITED.—It was not surprising that the first impression of the farmers using water to irrigate crops was that the supply would prove practically inexhaustible. They had come from regions of perennial springs and streams. Any stream that was wide and deep enough to be called a river rather than creek or branch, was navigable and navigated by some sort of craft. The westward course of the caravans was along the platte and mostly in summer, when that stream was broad and turgid, with a channel that appeared to be deep. There had been no diversion of waters for irrigation or domestic purposes. Westbound travelers saw the Platte then at high stage. Among these emigrants hundreds reached Auraria and Denver disheartened and bankrupt, and many started back immediately, because discouraging tales had already been told them by the "go-backs" along the route. It was only natural that they thought of the river as a means of floating or paddling back to the States. Some tried that method, a few reaching the mouth of the Platte, or going on down the Missouri.

Newspaper accounts of these attempts throw an interesting sidelight on the misconceptions of the pioneers regarding the use that could be made of the Platte, and they seem to show that the flow was steadier throughout

the warm season, as no water was taken out for irrigation and timber cutting had not yet started. This explains also the fact that in the early years ferry service between Denver proper and the country on the north side of the river was not only necessary but easily maintained. While the ferry was discontinued after Brown's bridge was built, it was re-established temporarily when that bridge was washed away in the Cherry Creek flood of 1864.

BOAT TRAFFIC ON THE PLATTE

"Boat Departures" were a part of the week's news for a time, the items following all being taken from *The Rocky Mountain News* of various dates, as enumerated:

April 29, 1859.—Within the last three days, several small boats have left here laden with returning emigrants bound for the states. May they have a pleasant voyage down the Platte. P.S. Since writing the above, we learn that two of the above boats have been upset, their freight lost and their passengers returned to try their fortunes in the mines again.

September 10, 1859.—Boat Departures: On Wednesday afternoon Scows "Ute" and "Cheyenne" for mouth of Platte. Scow "Arapahoe" for New Orleans. All laden with passengers and freight.

September 17, 1859.—Sailed on the fourteenth, Clipper "Pittsburg," Captain J. Steiner, for Pittsburg, Pa., eight passengers and their baggage. At St. Louis, boat and passengers will take steamer for final destination. Captain S. thinks he will put a steamer on the Platte the coming season. Success attend him.

October 6, 1859.—Boat "Empire State" sailed on Tuesday last for St. Joseph, Mo., with G. H. Washburn and N. G. Bartholomew as passengers and their baggage, bound for Tompkins county, N. Y. They design returning in the spring.

June 14, 1862.—Sailing down the Platte: Two or three gents, Salisbury, Paine & Company, left day before yesterday for the Missouri River. They had a boat built here, and furnished it with sleeping and cooking accommodations, so that they need not land or lay over till the end of the voyage to Plattsmouth. The boat carries a large sail and with its aid, and that of the rapid current, it is expected they will beat the Express and make the trip inside of six days. Several hundred dollars were bet on their making the through voyage in six or seven days.

That the Platte was not navigable was thus early discovered, though many years elapsed before courts and government realized that this was true in a legal as well as a practical sense. A new agriculture—that is new to Anglo-Saxon people—was being built up and with it would come principles at law and in equity concerning the use of water, that would revise the English legal view of water rights.

FIRST OFFICIAL REPORT IN 1861

The first official notice of the development of agriculture by irrigation in the new Territory of Colorado was taken by the federal government as early as 1861, in which year the Patent Office Report on Agriculture contained a chapter that bore the caption: "Territory of Colorado: Its Soil, Its Climate, Its Mineral Products and Resources." In that early period the United States Patent Office had supervision of publications relating to

the nation's agriculture. The contribution on Colorado Territory was by Edward Bliss, one of the editors of *The Rocky Mountain News*. It summed up what little progress had been made, but was more largely devoted to a discussion of prospects, indicating an intention on the part of Colorado's publicists and leaders of thought to develop all natural resources, rather than hoping to build on mining alone.

That portion of the report dealing with agricultural possibilities is essential here, and quotations follow:

An examination of the map, and a careful tracing of the limits above described, will convey some general idea of the topography of Colorado Territory. The Rocky Mountain Range—the great backbone of the North American Continent—runs through the Territory from north to south, dividing the vast plains of the eastern slope from the extensive parks and savannas which stretch away toward the Sierra Nevada. The eastern portions of Colorado embrace that mythical region laid down on all the old maps as “the Great American Desert.” It is almost needless to add that the discovery and development of the mineral resources of the Rocky Mountain region has furnished the evidence of over one hundred thousand witnesses against the existence of the “Desert.” The commerce of the plains, involving the necessity for the employment of immense herds of beasts of burden, has effectually dissipated the fabulous belief that a vast desert existed in the basin east of the mountains, where nothing to sustain animal life could be obtained. The writer of this has often seen herds of several hundred cattle feeding in various portions of the “desert” district. On all the water courses, and especially in bottom lands, the grasses thrive most luxuriantly. It is nevertheless true that on some of the uplands there is a tendency to barrenness, caused not only by the aridity of the climate, but by extended strata of sand. Yet even upon these wastes there are frequent patches of thrifty vegetation, while the cactus covers the earth with its brilliant and beautiful rosettes of flowers.

Nearer the base of the Rocky Range and along the valleys of the streams which have their origin in the mountains, vegetation is more prolific and the soil more arable. The grasses here are not only more abundant, but grow to immense size and contain more nutriment than the cultivated species of the most prosperous agricultural districts of the Mississippi Valley. These grasses cure standing, and cattle feed and thrive upon them throughout the entire winter months. As a great grazing and stock raising region, Colorado possesses advantages over Texas. The latter is subject not only to terrible storms but long continued rains, which to unsheltered stock are fatal; while in Colorado no bleaching rains, no tornadoes, destroy the standing grasses, or waste their nutriment. It is rarely that unworked cattle in Colorado require winter fodder. For three winters past there has not been twenty days in each that loose stock required feeding, and it is a remarkable fact that they will not eat cured hay so long as they can have access to ungrazed pasture lands. Beef cattle are driven in the months of January and February direct from the fields to the shambles, and nowhere in the world can finer or more tender beef be found than in the markets of Denver.

These facts furnish incontestable proof that the soil of that region is highly productive. But a serious apprehension exists in the minds of many that the capabilities of the country for extended agricultural purposes are limited. This opinion is based upon the fact that rains throughout the entire region are infrequent and occur at seasons when their grateful influences are not beneficial. Candor compels the admission that there is some truth in this statement. Throughout nine months of the year—from October to July—not an inch of rain falls; and even in July and August, when showers are common, they are of such short duration that the parched earth is seldom satisfied. The observation and experience of three years has demonstrated that the cereal grains cannot be extensively and profitably cultivated in Colorado by the same system generally followed in the grain-growing districts of the States. Plowing, sowing and harvesting, even though prosecuted with the same skill, will never produce the satisfactory results which reward similar efforts in the eastern states. Nature withholds her rains from the plains of Colorado, and admonishes her people that they must strive to overcome this deficiency by artificial appliances.

Thanks to the record of history, to the necessity and experience of various portions of the world and to the actual successful efforts of the people of Colorado, they are not to be deprived of the inestimable blessings which flow from agricultural enterprise. Throughout the entire length of the mountain range, the rocky barrier is rent with canons, through whose beds copious volumes of pure water rush forth into the valleys beneath, and stretch their limpid arms far out into the plains. The sturdy farmer has but to check the dashing torrent in its course, and divert a portion of its grateful element, through artificial channels, across his thirsty and arid fields. A combination of interests and a general and well-directed system of irrigation, will soon relieve the territory of Colorado from the difficulties which now limit agricultural labors. Indeed the results of numerous irrigating enterprises during the past season, if for gardening purposes solely, were not only most gratifying but immensely profitable. It was ascertained that in the wide bottom lands of the Platte River and other streams near the base of the mountains, there was a rich, alluvial deposit which only required water at long intervals to promote an astonishing vegetable growth. All the succulent varieties of plants attained to an enormous size, retaining tenderness, juiciness, and sweetness which almost everywhere else belong only to the smaller varieties. The wild fruits of Colorado are also various and abundant. Of these, cherries and currants are most numerous, while raspberries, grapes and plums are, in some sections, quite plenty.*

The statement that there is no rainfall from October to July indicates, perhaps, that the writer of the report did not consider winter and spring snows of any value to crops; or possibly his manuscript was mis-read by the printer. However, that may be, it is clear that the pioneers realized their dependence on irrigation for successful agriculture and they had in mind a "well directed system," instead of the haphazard way in which farming by irrigation developed.

U. S. RECLAMATION URGED IN 1864

Noting from day to day in the growing season, the progress of crops and the development of farming by irrigation, so new to all, The Rocky Mountain News gave the subject much attention. Impressed by the vast extent of unused land, conscious now of climatic limitations and an awakening perception of the value of water, the editors saw what a tremendous undertaking loomed if this development were left to individual effort and, on the other hand, how hopeful the prospect if the central government could be persuaded to take it up. An editorial which appeared in The Rocky Mountain News of December 21, 1864, thus becomes the forerunner of the movement for federal reclamation of arid lands. Its caption was: "A System of Irrigation," and it read as follows:

It should be urged upon the present Congress to enact some law general in its provisions, to provide means for the irrigation of agricultural lands in the western states and territories. It is a well-known fact to all who are familiar with the country and its climate, that more than one-half of the total area of the United States cannot produce crops of grain or vegetables with certainty except by irrigation. There are localities, small in extent, where the rule does not apply and there are occasional seasons at long and irregular intervals when irrigation is unnecessary. Yet, it is idle to depend upon rains to nourish crops. The only sure dependence must ever be upon artificial irrigation. This necessity applies to the States of California, Oregon, Nevada

*Patent Office Report, "Agriculture," 1861. Territory of Colorado, p. 154.

and the western half of Kansas; and to the territories of Colorado, New Mexico, Arizona, Utah, Washington, Idaho, Montana and the western half of Nebraska and Dakota. Such being the fact and so large a number of people being interested therein, it is surprising that such a vital step for the interest of the country has never been taken. Especially is it strange that California, with all her enterprises and her live congressmen, has never agitated the subject.

The plan that we have to suggest is this: Let Congress, by general law as above indicated, grant a portion of the public domain to individuals or companies who will construct irrigating canals for the improvement of the same. Suppose it is one-half, to be determined by alternate sections, quarter sections, or eighty or forty acre lots, as the case may require. Let the law be so regarded that no unfair advantage can be taken of it. Bind the parties to supply water to the owners of intervening lands at fair and just rates and within a reasonable time after their works are completed convey to them their moiety of the public lands. The United States railroad grants are fair precedents and their general plan and restrictions are safe guides to go by.

Then to save the general government from loss, let the remaining alternate tracts of lands be doubled in price. Instead of fixing the minimum at \$1.25 per acre, make it \$2.50. There are millions of acres of land which would more readily bring \$5 per acre under the advantages of such a system of irrigation, than \$1.25 without any such facilities. Every drop of water that emerges from the great mountain chains of the West in their thousands of streams, should be made useful. So far from the nation being injured by donations to effect that object, it would, on the contrary, be immensely benefited thereby; first, in creating a quick market and value for millions of acres of land that must otherwise remain for many years utterly unproductive and, secondly, by hastening the growth and productive wealth of the great states that are to arise on the western half of the continent.

NO LAND SETTLEMENT POLICY

Interminable delay, due to lack of vision and statesmanship at Washington, made federal reclamation, when it finally came, merely a demonstration of land settlement in spots. One wonders what might have been the result of a national land settlement policy such as here suggested. While it seemed impractical and visionary then, it was calculated, at any rate, to repay the government for systematic development of water by turning the land over to those whose labor would make it productive. Instead, the West was allowed to "grow up" just as had other regions of the Continent, though by reason of climatic peculiarities, its problems are of regional and national rather than individual concern.

HORACE GREELEY'S PROPHECY

Horace Greeley had a clear conception of what water meant to the West, and he indulged in prophecy which, read now, shows the grasp he had on possibilities as a result of his journeys across "the Great American Desert" and beyond. The New York Tribune, during April, 1870, at a time when the Union Colony was showing its first signs of life, contained the following characteristically positive editorial bearing the signature of the great publicist:

I am confident that there are points on the Carson, the Humboldt, the Weber, the South Platte and the Cache la Poudre and many less noted streams which thread the central plateau of our continent, where an expenditure of \$10,000 to \$50,000 may

be judiciously made in a dam, locks and canal for the purposes of irrigation and milling combined, with a moral certainty of realizing fifty per cent annually on the outlay, with a steady increase in the value of the property. * * * Whosoever lives beyond the close of this century and shall then traverse our prairie states, will see them whitened at intervals by the broad sails of windmills erected over wells, whence every gale or breeze will be employed in pumping water into ponds or reservoirs, so located that water may be drawn therefrom at will and diffused in gentle streamlets over the surrounding fields to invigorate and impel their growing crops. And when all has been done that this paper faintly foreshadows, our people will have barely indicated, not by any means exhausted, the beneficent possibilities of irrigation.

Great reservoirs have been built on these streams, water is led out from them for irrigation over many fields, but power development has taken the form of electricity in a way undreamed of by the great editor.

His vision of the Colorado plains dotted by windmills has materialized, though not to the extent he believed. Every gale and breeze pumps water for domestic uses, even though the "sails" are not of canvas but of steel. Greeley, like others of his time, expected too much from ground water and stream flow. Nevertheless, without such prophecies to spur the imagination, little would have been done toward water development.

PRESIDENT GRANT'S RECOMMENDATION

Three years later we find another person of note giving expression to the dreams of the western promoter in an official document. The message of President Grant to Congress in 1873 contains a remarkable recommendation, for which the president relied on Colorado advice, as he had only a superficial knowledge of irrigation, gained on his several visits to the state. The message said:

"In this connection I would recommend the encouragement of a canal for the purpose of irrigating from the eastern slope of the Rocky Mountains to the Missouri River. As a rule I am opposed to donating the public lands for internal improvements owned and controlled by private companies, but in this instance I would make an exception. Between the Missouri River and Rocky Mountains there is an arid belt of public land from 300 to 500 miles in width, perfectly valueless for occupancy of man for want of sufficient rain to secure the growth of any agricultural products.

"The irrigating canal would make productive a belt of country as wide as the supply of water could be made to spread over, and would secure a cordon of settlements connecting the present population of the mountain mining regions with that of the older states.

"All the land retained would be a clear gain if alternate sections were reclaimed by the government. I would suggest that the reclaimed sections be thrown open to entry under the homestead law and sold to actual settlers for a very low price."

PROMOTERS INFLUENCED GRANT.—The President of the United States evidently took Colorado irrigation promoters at their word. The project, even then known as the High Line Canal, was agitated for many years before there was action which resulted in development, but on a minor scale when compared with early promises and expectations. In 1877 this project had taken form and a description included in a report on the year's progress was as follows: "Third, the High Line Canal, as it is popularly called, which is to divert a large volume of the Platte at a point in the canon, 25 miles southwest of Denver, and convey the water—a river in volume—along the high plains, south, southeast, east and northeast of the city, reclaiming through cultivation millions of acres of the Great American Desert. * * * The improvement will cost a million dollars, but its benefits to the state and to Denver will be counted by many millions. A compact agricultural district covering the plains for a hundred miles eastward will contribute more to the permanent, steady growth of our city than any other influence that can be brought to bear."*

ELBERT OUTLINES LEGAL PRINCIPLES

Governor Elbert's message to the Territorial Legislature at the session of 1874 laid down two principles of irrigation law which were later embodied in the statutes. Briefly, they were that ownership and control of the water belonged to the state and control and management of canals should be, as far as possible, local and by those immediately interested. Governor Elbert's discussion of the subject of agriculture in that message reflected conditions at the time and is as follows:

The agriculture of Colorado has proven two things; first, that our soil, when irrigated, is equal to the best agricultural lands of the continent; second, that agriculture by irrigation has advantages that make it the most successful method of husbandry.

The following have been determined as about the average crop throughout the Territory: Wheat, 28 bushels per acre; oats, 55 bushels per acre; barley 40 bushels per acre; corn, 35 bushels per acre; potatoes, 200 bushels per acre; onions, 250 bushels per acre.

But these figures are far below what may be produced with extra care and labor. For three successive years the premium crops of wheat, exhibited at the Territorial Fair, ranged from sixty-seven to seventy-three bushels per acre. Potatoes have given from four hundred to six hundred bushels per acre. Onions have reached one thousand bushels per acre. A cabbage of eighty-two pounds weight has been sold in the Denver market. Those of forty to sixty pounds are plentiful at each annual fair. Carloads have been shipped away in which the closely trimmed heads averaged throughout, twenty-three pounds apiece.

The necessity of irrigation, as an appliance of agriculture, demands a carefully prepared system of laws upon the subject. While as a matter of legislation the subject is one of exceeding difficulty, intricacy and concern, so long as the entire matter is subject to State control and management there is no just ground for apprehending any serious mistake or permanent hardship. However, imperfect first legislation upon the subject may prove, the Legislature of the Territory or State from year to year will

*Rocky Mountain News, January 2, 1878.

correct errors, supply deficiencies, reconcile conflicting provisions and provide for new wants, until a full and complete code of irrigation laws will be secured and enjoyed.

First.—That to the State should belong the water of its streams and the control of its distribution among canal owners. From this it would follow that no one would be allowed to divert the water from the natural bed of the stream to the injury of those having previously acquired and vested rights.

Second.—The control and management of canals should be, as far as possible, local, and by those immediately interested; and in this view I would suggest that each considerable stream, with its system of canals, should constitute a district of itself, and should be under the control and direction of a board of canal commissioners, elected by the people of the district. The powers and duties of this board should be amply and clearly defined, and should include the powers of a board of arbitration, with a view of avoiding tedious and costly litigation and of giving to those interested an inexpensive tribunal, before which the manifold questions which will arise could be, if they desired, primarily brought and adjudicated.

URGES LEGISLATIVE ACTION.—In the same document Governor Elbert urged the Territorial Legislature to back up the action of the Trans-Missouri development convention, which had been held at Denver, October 15, 1873, and which had adopted a memorial to Congress urging federal aid for irrigation. In this connection the governor said:

If there were no other argument in behalf of government aid, we would find one of first importance in the fact that this region is the great metalliferous area of the republic. While it vies with the East in coal, iron, copper and all the baser metals, it is pre-eminently the gold and silver region of the continent. The amount of gold and silver coin among a people is largely the measure of their prosperity. To produce the precious metals is of first importance with every great nation. The point I make is, that the mining interest is dependent on local agriculture. You cannot work your mines profitable on imported bread. The thousands who now, and will hereafter delve in these mountains and lift their glittering treasures to the sunlight, must draw their sustenance from the fertile valleys that lie enveloped in their arms and stretch away from their feet. And until this condition of things is compassed, your mines will never be economically or successfully worked. Until the plain shall send to the mountain its gift of bread, the mountain will withhold from the nation its gift of gold.

ROUTT RECOMMENDS FEDERAL AID

Governor Routt, in his message to the First General Assembly of the state on the topic of "Irrigation and Agriculture," said:

In some sections the water supply is wholly inadequate to the wants of the people and, to remedy this deficiency, I would recommend that some general system may be adopted by your honorable body, so that the waters of the larger streams may be made, by means of suitable reservoirs and canals, to subserve the interests of mining, agriculture and manufactures. The filling of these reservoirs during times of high water, in spring and early summer, would work no injury to farms along streams, while from the supply thus obtained large arid tracts of country with no natural water courses could be reclaimed and made productive.

The expense of executing such a work on a sufficiently large scale is too great to be undertaken by the state at present, or by individual enterprise, and as the general government has made to other states large grants of swamp lands, which by labor and the expenditure of money have become very valuable, why should not we, with our vast, unproductive plains, ask the government to assist us in like manner by a grant of lands which would enable the state to accomplish this most desirable object? I would, therefore, recommend, that you by memorial assist our senators and representatives in the Congress of the United States to secure the desired aid.

RAISES FORESTRY ISSUE.—Incidentally the first state governor, who had also been the last territorial governor, raised the issue of forestry, corollary to the water question. He called attention to a recommendation of the Constitutional Convention, urging the General Assembly to provide, "that the increase in the value of private lands caused by the planting of hedges, orchards and forests thereon, shall not for a limited time, to be fixed by law, be taken into account in assessing such lands for taxation."

REPORT OF HAYDEN SURVEY

The United States Geological Survey, under F. V. Hayden, took account of irrigation possibilities, and in the report for 1876 the estimate of tillable land was 4,686,720 acres. While this was an independent compilation without reference to the first figure given in this chapter, in the estimate of 1859, nevertheless it closely approximated the earlier figure. The Hayden report said: "There is water enough to irrigate this area without the employment of reservoirs. This is 7 per cent of the whole area. In addition, 52.6 per cent is valuable for pasture lands. The aridity of the atmosphere is so great and the rainfall so light, so variable and so sudden in its character, that practically irrigation is universally depended on, and is almost as much a matter of course as the sowing of the seed."

NO CLIMATIC DATA.—As yet the first efforts at cultivating the plains without artificial watering, had not attracted attention of official investigators sufficiently to cause serious consideration. And as to irrigation, the Hayden Reports indicate that even men who presumably were engineers and at least theoretically familiar with irrigation, over-estimated the possibilities of watering the land from direct flow. This was not strange, for there was nothing on which to base calculations. The streams had not been measured; no one knew the extent of the snowfall, nor was the average annual precipitation known for any considerable period, the Denver Signal Station (now the United States Weather Bureau) not being established until November 20, 1871. Evaporation also was a closed book and no one had thought of that phase of the subject. Farmers, as well as the scientific men attached to the various survey parties, had come from a region where streams were of an entirely different character, and desert conditions were not understood, hence it was not strange that the supply was considered practically inexhaustible and the common opinion was that nothing was necessary except to tap a creek or river and let the water take its course.

PLATTE-ARKANSAS CANAL SCHEME

There was one scheme, however, that, though it came from apparently scientific sources, taxed the credulity of even the most optimistic. The

originator of this was Professor Cyrus Thomas of Illinois, an entomologist who was attached to the Hayden Survey for the purpose of investigating the locust plague, but who strayed from his own line into irrigation, with which subject he was unfamiliar.

A PREPOSTEROUS PROPOSAL.—Professor Thomas's proposal was to join the Arkansas and the Platte by a 200-mile canal in eastern Colorado, back up the combined waters, creating a series of lakes, for irrigation and incidentally modifying the climate and increasing rainfall. This scheme is described in the Hayden Report of 1876 as follows:

My plan is to throw up an embankment running north and south from the Arkansas to the North Platte, curving east and west so as to follow the contour. Then, by throwing dams across the streams, turn the water into this reservoir. * * * An embankment or wall, averaging 30 to 40 feet in height, would, as the average slope here is about 6 feet per mile, form a lake six to eight miles wide and 200 miles long. This would give a surface of some 1,200 square miles. * * * This would irrigate from 12,000 to 14,000 square miles.

Professor Hayden's comment was:

"The difficulty would be to get water for the reservoirs. The total annual amount of water which the three rivers, the Arkansas and the North and South Plattes, could possibly deliver at the reservoir, even were none of it used above for irrigation, would be 73,873,000,000 cubic feet, an amount sufficient to make a depth of only about 2 feet in the reservoir. Now, as evaporation in that climate is at the rate of 5 to 6 feet annually and the greater part of this in the summer, it can easily be seen that but a small part of the 12,000 to 14,000 square miles will have any chance of getting irrigated; indeed, it would be difficult to keep the bottom of the reservoir moist."

RANKED WITH CHINESE WALL.—Professor Hayden was obliged to refer to the scheme in the 1876 report because of public criticism of the Survey. He made it clear that the idea originated with Thomas and that he had never approved it, in fact, he says somewhat sarcastically: "This is a truly magnificent scheme and one worthy to be ranked with the Chinese Wall and other expensive follies of which the world had been guilty." "Other plans are in effect," says Hayden, "to take the Arkansas and South Platte from their beds at the foot of the canon of each stream and carry them over to the Arkansas Divide bodily. * * * There is no necessity whatever for carrying the water in any case more than ten miles from the river. It is unnecessary to dwell further on this subject of reservoirs, as the necessity for them is far in the future."

Regardless of discussion of plans and schemes, feasible and foolish, reservoirs were being built at that time, and found economical and effective.

George W. Harriman, on Bear Creek in Jefferson County, filled a pond from the creek in 1877 and sold \$600 worth of water from it, which pro-

duced 6,000 bushels of wheat for the farmer applying the water.* Harri- man was so successful in this, his first venture at selling stored water, that he built a larger pond near Littleton, which later became a part of the Denver city water system. .

UNION COLONY SETS THE PACE

To the Union colonists of the Greeley district belongs credit for putting the use of water for irrigation on a truly practical and co-operative basis. No other region, state or country supplied the inspiration or example for the system of distribution applying the principle of co-operation to that as well as to other affairs of the colony, which resulted in systematizing the practice and then in extending the Greeley method to other Colorado districts gradually, as it was discovered that selfishness and individualism had no place in dealing with the element that is the lifeblood of agriculture.

EXPLAINS GREELEY SYSTEM.—Nathan C. Meeker, one of the founders of the colony, gave a detailed explanation of the Greeley method of water distribution and exchange, and this was incorporated in the Hayden Geological Survey report for 1876, the following being a quotation:

The system of irrigation established at Greeley is different from any other in the world, particularly in regards to the right to water. The valley of the Cache la Poudre in which Greeley is situated was located and settled by the Union colony composed of only 600 members, mostly heads of families. The location and purchase of land was made by a committee, the president of which had control of a common fund amounting to over \$100,000. With a portion of this money the land was bought and with another portion the irrigation canals were constructed and a fence built around the whole domain, a distance of 45 miles. A canal 10 miles long waters the town and suburban property, being 15 feet wide and $2\frac{1}{2}$ feet deep. It lies on the south side of the Cache la Poudre. The other canal is 36 miles long, 22 feet wide and 5 feet deep. As these canals were paid for out of a common fund, the right to use water is attached to the fealty or to the soil, always being designated by the proper subdivisions of the section and township. The price originally attached to a water right was \$150, but, enlargements having been made, the cost has been added, and now the price is about \$300. There is, therefore, no charge made for the use of water, but there is an annual charge for superintendence and repairs, usually about 25 cents an acre per annum. All other canals in the state are owned by companies, and the charge for water per acre, for one season, is \$1.50 to \$2.00, so that the cost of water for a year for 160 acres is more than a whole water right in the Greeley canal. Now while a water right is attached to a particular piece of land, as above stated, it is permitted that the owner of a right may transfer his water to another piece of land for one season, or sell it for the same time to another farmer, the price being from \$20 to \$30, but increasing year by year. The volume of water which a water right carries, has been about 40 inches delivered, say under 6-inch pressure and this one right will water 40 acres, that is, an inch to an acre. But as the average size of farms is 80 acres, a farmer either owns two rights, or hires another, or as frequently exchanges. Thus farmers on a common lateral agree that one farmer shall have the use of a half a dozen water rights for one day or two days, then another farmer will take the same body of water, and so around whereby an immense volume of water is obtained and a large area is more expeditiously irrigated than a smaller one would be in proportion. This arrangement works extremely well; the plan of making water nearly as transferable as a horse adds immensely to the capacity of the stream itself.

*Golden Globe, November, 1877.

When irrigation first commenced, great difficulty arose in dividing water, for those living along the upper part of the canal got most water; much of the time those living at the lower end got none, and disputes and complaints were general, nor could any light be had on the subject from those who had been irrigating elsewhere long before.

APPLICATION OF WATER.—It was the practice on the colony lands to water all gardens once a week through the season. Corn was watered three or four times by letting the water run through alternate rows. Potatoes were watered twice, and that quickly, "for much moisture was fatal to them." Wheat and other small grains received two and sometimes three irrigations by flooding. Such, at least, was the practice advised in the first years, and followed by most colonists, who acted on the suggestions of their leaders.

AN AMUSING INCIDENT.—An amusing incident was related in a lecture delivered by William Russell Thomas at one time professor of Constitutional History and Irrigation Law at Colorado Agricultural College, illustrating the mistaken notions that newly-arrived colonists had about irrigation and the engineering features of canal building:

"One of the great canals which water the lands of the colony was under construction when the bulk of the colonists arrived, and such work being a decided curiosity to nearly all of them, quite a number went out one day soon after their arrival to look at it. The canal was being constructed under the direction of the late Col. E. S. Nettleton, one of the most accomplished irrigation engineers the West ever possessed. But the colonists looked at it in dismay. It was running uphill. Constituting themselves a self-appointed committee, they hastened to report their amazing discovery to Gen. R. A. Cameron, the superintendent of the colony.

"General Cameron was a man of infinite tact, and a wonderful manager of men. He listened calmly to their statements, and then, as if it was a matter of small importance, replied: 'Well, gentlemen, you observe that this ditch is being constructed to take water from the Cache la Poudre and carry it around to the Big Thompson. Now, if as you say, the water will not run from the Cache la Poudre to the Big Thompson, it certainly will from the Big Thompson to the Cache la Poudre, so you see we will get the water either way.' The committee departed, entirely satisfied."*

Estimates of the cost of irrigation furnished by canal companies to the Hayden Survey in the early seventies were: Plattewater Canal Company, \$3 per inch through the season; Table Mountain Canal, \$1.50 per inch; Farmers' Ditch of Jefferson County, \$1.50 per inch; Ralston Creek Ditch Company, \$3 per inch.

*From lecture by William Russell Thomas on "International and Interstate Water Rights" at University of California, August 6, 1902.

NATHAN MEEKER ALSO PROPHESES

Horace Greeley, whose aptitude at prophecy has already been referred to in these pages, had an imitator in his friend and associate, Nathan C. Meeker, editor of *The Greeley Tribune*. As an evidence that Meeker's confidence in posterity was not misplaced, let us here consider a declaration of what was to come, as it appeared in *The Tribune* early in January, 1875:

"Now we shall prophesy, and we shall do so with the consciousness that this prophecy shall go down to a future age, for *The Greeley Tribune* is certain to be read in the coming time, not so much on account of its news as of its ideas, and this is what we predict: In fifty years from today, the forty- and eighty-acre farms over the river, and in many other places in Colorado as well, will show the highest cultivation; beautiful trees will adorn the scene, fruits of almost every kind will abound, noble mansions, the homes of happy farmers, will extend for miles, and land will bring from \$500 to \$1,000 an acre."

DID NOT MISS IT FAR.—The half century has elapsed and Meeker did not miss the truth very far, though his minimum figure for land is as yet the maximum. The reason for that is, farming in the Greeley district under irrigation, as in other sections of the state, has remained on the extensive rather than the intensive plan which Meeker had in view, as is plain from the statements which preceded his prophecy, these paragraphs reading as follows:

The number of acres now in cultivation does not probably exceed 100,000 if so much; and it is by no means likely that it will reach 200,000 during the next fifty years. This may seem a large amount to some, to others a small one. We realize much better by comparison. A small county in the states, twenty miles square, contains 256,000 acres; so that neither this nor the next generation is likely to see as much land in cultivation in Colorado as is now in cultivation in Franklin County, Ohio, or in Morgan County, Illinois. When the attention of Governor McCook was called to this fact shortly after his return from Washington, last spring, he dropped his hands on his knees and exclaimed: "If that is the case, goodbye Colorado." He meant by this that there was no earthly chance of settling the country as even a small eastern state is settled.

It is true that Max Clark has allowed that millions of acres might be irrigated in Colorado, but he did this in reply to those who claimed that ten millions could be, and before he had received the experience of the last year in regard to the limitations of our water supply. It is to be considered, however, that 100,000 acres well cultivated, as it will be when land gets to be worth \$50 to \$150 an acre, as it presently will, can produce an immense amount of grain and vegetables, and it is well to consider that most of the fruits and vegetables that supply the city of Paris, with its population of nearly three millions, comes from only 3,000 acres. These acres, however, are in small parcels, like the allotments worked by English laborers, and they are broken up less by the plow than the spade, and no other land in the world yields so enormously, unless it be the irrigated gardens of northern Italy. There would seem here no better chance for a farmer owning 40 or 80 acres under water, to get rich, than to improve it and keep it, say, ten years. The wealth of the farmers of the United States has been almost wholly derived from the increased value of their

lands, and it does seem to us that the increase will be greater in Colorado than it has been in the States, simply on account of scarcity—a quality that everywhere increases values, since what is abundant must be cheap.

Such discussions are interesting in the light of history, because, in spite of the evident purpose of the leaders among pioneer farmers to arouse the people of their own day to a sense of the value of water as a factor in farming, their predictions largely fell below the actuality of the present day. Instead of 200,000 acres farmed under irrigation fifty years after Meeker's prophecy, the total in the state, according to assessors' returns, is approximately two million and a half, while the irrigated crop acreage in Weld County alone exceeds three hundred thousand acres. Still Meeker's picture of well-shaded farm mansions, "the homes of happy farmers, extending for miles," has materialized, though in 1875 the editor who looked upon the barren plain and thus foresaw what was to be, was called a visionary and a dreamer.

COLORADO IRRIGATION DREW ATTENTION

Colorado was much in evidence in the eastern press after completion of the railroads to the mountains, as a land of promise for settlers and possibilities of wealth through the spectacular range livestock industry. Following this trend of public interest, Harper's Monthly Magazine sent a staff correspondent, A. A. Hayes, Jr., to Colorado in 1879 to write up the livestock industry, and to give attention also to other phases of agricultural development, including irrigation. Hayes was accompanied by an artist, W. A. Rogers, whose pen and ink drawings are vivid and truthful illustrations of the scenes as vividly described by Hayes.

PETER DOTSON'S RANCH.—From the issue of November, 1879, are quoted extracts on irrigation as found on the ranch of Uncle Peter Dotson, a pioneer who came to Denver in 1861 with an army wagon train and four years later settled on the St. Charles southwest of Pueblo, where he was both miller and rancher.

An illustration of la Maquina de San Carlos shows the flume which brought the water from the St. Charles to the mill, where it turned the wheels that ground the grist, flowing off through the spillway down the arroyo in the foreground. Quoting now from the article which was headed "The Cattle Ranches of Colorado":

From the mountains nearby flows out the San Carlos, or St. Charles Creek, running in a northeasterly direction to the Arkansas River and its course was made visible as we approached it by the fringes of cottonwood trees. After what seemed a long drive, we turned to the west, up the Great Arroyo—a sterile valley with pinons, or scrub pines, and dwarfed cedars clinging to its slopes—and traversed it as far as the crossing of the St. Charles, passing on the way an eagle's nest on a rocky ledge, and a Mexican herder keeping his lonely watch over a large flock of sheep. Just at the crossing and where the creek forces its way through a cleft in the rocks, stood a substantial grist mill—La Maquina de San Carlos. Stopping here to give

our horses rest and to investigate the contents of the basket under the seat, we read on the locked door of the mill various uncomplimentary allusions to the absence of the miller when loads of grain had been brought tither from points far away on the Muddy or the melodiously named Huerfano. One individual had broken into verse and written as follows:

Where, oh where, did the miller go,
And leave to us no sign or trace?
The next time to the mill we must go,
We will go to some other place.

* * * Now the valley lay behind us and the foothills began to shut out the range; but Pike's Peak sixty miles off, loomed up as grandly as ever. Eight miles more were traversed and then we turned into a great farm yard, or corral, and stopped at a rustic stile. In a few moments Uncle Pete Dotson came up the path from the house and gave us a cordial greeting. * * *

Uncle Pete had evidently made good use of his knowledge and experience in the choice of his ranch. His domain embraced 9,000 acres, 5,000 of which were arable land. The ground sloped gradually from the foot of the range and the whole of his possessions were under his own eye. In a large barnyard were great granaries and a fine stone stable, which would not be amiss in any city in the United States; and at varying distances on the gentle slope could be seen the little cabins of the tenants, who cultivated parts of the land on shares; for it must be understood that this estate was not only a cattle ranch, but also a great farm.

There is no doubt that nearly everyone who visits this region for the first time, even if partially informed about it beforehand, is grievously disappointed at the arid aspect of the plains, and finds it hard to believe in the power of that great beneficent agent, Water, which can make every inch of these table lands and valleys * * * blossom like the rose. * * *

Water is thus both for the farmer and the herder—and the ranchman who is both farmer and herder—the sine qua non, the prime necessity; and just here did one see how well Uncle Pete had chosen his situation. He had nine miles of water frontage on the St. Charles Creek, and the same on the Muddy. Just where the former comes out of the Wet Mountain range, and where no one could take water above him, he had tapped it for his broad irrigating ditch, which, after a tortuous course through the estate, empties again into the stream from which it came, not a drop of its precious contents being thus wasted. Along the upper side of the fields lying on this gentle slope before described, run smaller ditches. Then during the season does the skillful Mexican laborer dig little channels leading down through these fields and, making little dams for the purpose, turn the water into them. The result is simple: Uncle Pete has raised 10,000 bushels of wheat, 6,000 of oats and



An old Mexican mill that stood on the St. Charles river south of Pueblo. "La Maquina de San Carlos" from "The Cattle Ranches of Colorado," Harper's New Monthly Magazine, November, 1879. Drawing by W. A. Rogers. (Reproduction by Grant Eddy.)

2,000 of corn and had a market for the whole on the spot, it being one of the charms of Colorado farming that the "honest miner" is both hungry and liberal and that the farm produce has ready buyers. Suppose, however, that for our present purpose we call farming a side issue and come to the cattle which this ranch would support all the year round. It is said that when Kentucky cattle men, fresh from the blue-grass region, see the plains they are entirely incredulous as to their fitness for stock; but the experienced stockman smiles, well knowing that the nutritious qualities of the grass are simply unsurpassed and that the food for his cattle for the whole year is ready at a minimum cost. For their water, again, Uncle Pete's splendid creek frontage more than amply provided. * * *

VAST NETWORK OF CANALS

During the decade following establishment of the Union Colony, the impetus given irrigation development in the Poudre Valley extended to other tributaries of the Platte, as well as to the main stream. There was a tendency to co-operate through district organization, a demand in some quarters for state control of water supply, and corporations were being organized for the sale of water and land. For a time threat of corporate monopoly of water hung over the agricultural industry, but court decisions and legislative action ended this menace.

The Cache la Poudre Valley in 1882 was declared to be "one vast network of irrigating canals."*

WAS A PRIMITIVE SYSTEM.—This description applied from LaPorte, near the mouth of Poudre Canon, to the junction of the stream with the South Platte, 35 miles below. Ten years before there had been many small ditches used for watering hay lands in the first bottom. There were no dams then, the river running bank full during the summer, overflowing into the ditches and flooding the meadows. It was primitive, but served the purpose, as hay was the principal crop, though here and there some grain was grown and gardens were watered from the ditches.

In twelve years, according to Pabor, the Poudre Valley canals had a capacity of 150,000 acres of arable land and construction was under way for 75,000 acres more, although in 1881 only 30,000 acres were actually under the plow in that valley. The Greeley Canal, built in 1871, was 27 miles long, the headgate being 12 miles west of Greeley, and its capacity was given at 25,000 acres, though the land was just then being broken up. The canal was built and owned by the colony, but ownership was transferred to the water-using farmers in its early years.

The assessment for supervision and repairs annually amounted to \$16 per water right of 80 acres; 40 inches of running water under a given pressure were allotted each user for the year. A branch of the main canal watered about 3,000 acres of gardens in and around Greeley, and laterals

*"Colorado as an Agricultural State," William E. Pabor.

carried a flow along the streets, "furnishing the inhabitants with water for household purposes as well as for irrigation of trees that line each street and the flowers that bloom so profusely about the houses."*

DEVELOPMENT WAS SYSTEMATIC.—This description by an agricultural writer, who was a Union Colonist, indicates the systematic way in which the use of water was developed, in contrast to the earlier haphazard irrigation practice of which there is record in the settlements along the Platte and the Arkansas.

Other Poudre Valley canals that came into use between 1870 and 1882 were the Lake Canal, projected in 1872, 15 miles long and costing \$15,000. This watered 8,000 acres. Box Elder Canal, in the upper valley near La Porte, dates back to 1863. In 1882 it was 7 miles in length and was being extended. Cache la Poudre Canal, built in 1886, was 8 miles long and covered 4,000 acres.

The Mercer, a pioneer ditch, originally chartered in 1862, was rechartered in 1872 and extended to 13 miles, covering 10,000 acres, half of which was in crop in 1881. Canal No. 2, built by the Fort Collins Agricultural Colony in 1872, cost \$15,000, its length 10 years later being 11 miles and its capacity 10,000 acres, most of which was in crop. Pleasant Valley Canal, chartered about 1879, was 16 miles in length and covered 8,000 acres, water being sold only to stockholders, with shares valued at \$100 each.

The above statistical information was published in 1883. Court records on decrees, established at a later time upon proper evidence, show the first decreed water right on the Cache la Poudre as of June 1, 1860, for a ditch taken out by G. R. Sanderson of Pleasant Valley, near the town of Bellvue. This was afterwards known as the Yeager Ditch, supplying the farm of J. H. Yeager, who purchased Sanderson's squatter's right in 1863. Other early rights on the Poudre were Priority No. 2, granted June 1, 1861, to Watrous, Whedbee and Secord; No. 3, June 10, 1861, for Dry Creek Ditch; No. 4, September 1, 1861, for Pleasant Valley Lake and Canal; No. 5, March 1, 1862, Pioneer Ditch Company.†

PABOR DESCRIBES CANALS.—Pabor supplies the description of the Larimer and Weld Canal, then the second largest in the state, owned by the Colorado Mortgage and Investment Company, Ltd., of London, England. Lands under this project were listed in 1881 at 60,000 acres, 20,000 acres of which were owned by the company. These lands lay along the north side of the river, stretching a distance of 25 miles between Greeley and Fort Collins. Three of the early reservoirs were included in this system, respect-

*"Colorado as an Agricultural State," William E. Pabor.

†Watrous' History of Larimer County.

ively 100, 120 and 180 acres in extent. It was designated as the largest system then in operation in Colorado, though the High Line Canal of the Platte Land Company was soon expected to outstrip it.

HIGH LINE CANAL PROJECT.—The High Line Canal, earliest of all big projects, but one of the last to be completed, and then only on a far lesser scale than its originators in territorial days had dreamed, was, in 1882, under financial control of the same British company that owned the Larimer and Weld Canal. The High Line was finished in 1882 from its source near the mouth of Platte Canon to Cherry Creek, a distance of 44 miles. It was projected to Box Elder Creek an additional 80 miles. The estimate at that time was that eventually 200,000 acres would be watered at a cost of \$3,000,000. This was a decided abridgment of the "dream canal" that Denver enthusiasts had outlined for the benefit of General Grant's western development policy, as expressed in his message to the Congress of the United States, which has already been quoted.



A lateral ditch carrying water from the main canal to the fields.

Lesser systems in northern Colorado included the Big Thompson Ditch, built in 1864, and watering 1,500 acres; the Handy Canal, 20 miles long, projected to reach 25,000 acres, and the Loudon Canal, all in the valley of the Thompson. In the St. Vrain Valley Highland Lake, built in 1872 by L. C. Mead and C. A. Pound, the first settlers on the prairie, a few miles east of Longmont, was serving a considerable acreage, and Pabor's statement was, "not many new farms can be opened here, but those that are taken can be cultivated to a greater extent and by a more thorough system of farming be made to yield more valuable returns."

FARMERS DITCH AT BOULDER.—The Farmers Ditch, filed on in 1862 on Boulder Creek, was watering 1,500 acres at this time in its 7 miles of length. Others from Boulder Creek were the Beasley, built in 1875, and serving farms along a 12-mile course, the Chambers Canal, and some lesser ditches.

The Fountain Valley Canal below Colorado Springs was built in 1872 and the limit of its capacity 10 years later was thought to be 5,000 acres. Southward along the Arkansas and its tributaries development of irrigation along modern lines had barely begun. The Rocky Ford Canal, as it was designated in 1882, had a length of 13 miles and capacity for watering 12,000 acres, then mainly in meadow land, but all under fence. There was irrigation farming in limited localities in other sections, as, for example, at Sterling on the lower Platte, where some 20 or more farmers had taken up land watered by a ditch. Crops had been grown in the upper Gunnison country since 1874 in a limited way, also along the Saguache since the early sixties and elsewhere around the mining camps under individually owned ditch rights.

ALSO VISITS WESTERN SLOPE.—The fruit belt of the Western Slope was barely emerging from an Indian reservation, but its possibilities for irrigation had been investigated. Pabor, who was so impressed with the country that he finally became a resident of the Grand Valley, quoted the words of an unnamed writer which follow: "That there is no better land and no better climate on the face of the earth, with an altitude of from 4,000 to 5,000 feet, susceptible to producing everything by irrigation that would be desirable—fruit of nearly every description and all the different varieties of grain and vegetables grown in the states of Missouri and Kansas."

It is interesting to note how closely this observer estimated the potential irrigated acreage of the Uncompahgre Valley at a time when the Utes had just moved across the border to Utah. Pabor described the valley as 35 miles long and 4 miles wide, estimating that it contained "64,000 acres, which can easily be irrigated, with perhaps as great a quantity on the adjacent mesas that could be watered, but would require construction of expensive canals." At that time very little of this land had yet been surveyed, but settlers were eagerly taking it up as fast as it was opened to entry.

NO FAITH IN DRY FARMING.—This outline of the status of irrigation in the early eighties serves to convey an idea of conditions at a time when attention was given much more to the range industry than to general farming. As to the possibility of farming the plains, Pabor said: "It is not certain that the vast waste of plain between the borderline of rainfall in Kansas and in Indian Territory on the east and the foothills of the Rocky Mountains, can be reclaimed from their solitude and apparent desolation and transferred into abodes fit for the habitation of man. Grass, sagebrush and greasewood indicate fertility of soil. It is known that where sagebrush grows the finest wheat-producing lands have been found by

our farmers in the valleys and uplands bordering our streams. It would seem as if all the elements of agricultural growth were lying *perdu* in the soil of the plains, lacking only one thing to bring them to fertile productivity; that one thing is water."

AGRICULTURE NEGLECTED.—That progress in irrigation development had not moved uninterruptedly is made clear by reference to Hubert Howe Bancroft's statement in his "History of Nevada, Colorado, and Wyoming," from which we quote:

"After thirty years of settlement farming was hardly secondary; the mining and grazing interests overshadowed it. The era of neglect of this industry was attributed to the scarcity of water on the surface and the dryness of the atmosphere. Then came the water grabbers and fenced off the rivers from the common use of the people; or water companies constructed miles of canals, carrying water through immense tracts which were thereby greatly augmented in price. They condescendingly sold the water which belonged to the people to the farmers along their route and charged them with a 'royalty' upon their land—that is, they exacted a bonus for benefiting the land irrigated in addition to the water right. Another abuse was the practice of aliens in taking up large tracts of land in the state for grazing, or for speculative purposes. The legislature of Colorado, following the example of Congress, passed an anti-alien law to prevent English capital from fastening upon state lands."

CANAL BUILDING OVERDONE

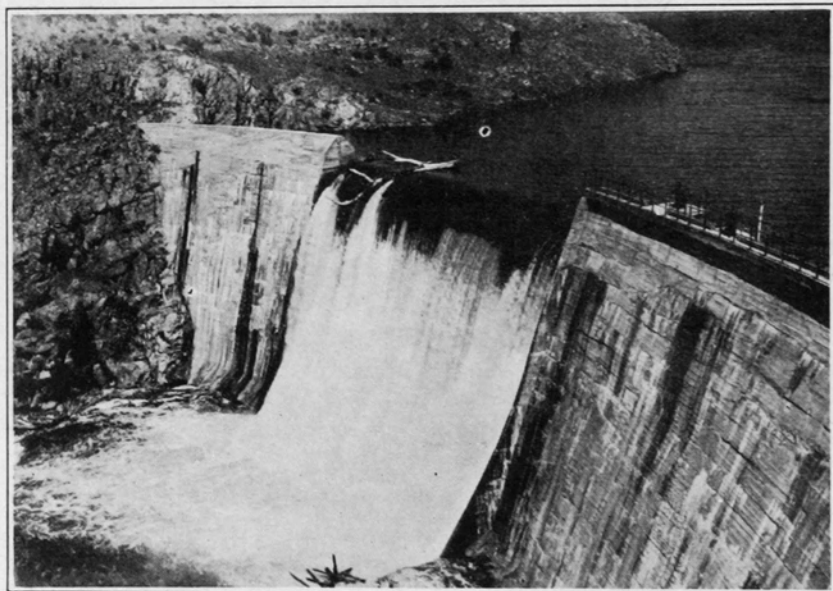
Records of development of the late eighties show construction of irrigation systems and canal projects out of all proportion to the actual acreage watered, illustrating the speculative feature with its attendant inflation and, in natural sequence, restrictive legislation, refusal of the water users to submit to exorbitant charges and to the odious "royalty"; then failure and bankruptcy of the corporation that had attempted to squeeze unfair profits out of both land and water.

In these years public opinion of farming by irrigation had undergone a decided change, the earlier optimistic views having given way to the feeling that the limit of development had been reached. Prosperity of the range industry, as contrasted with general farming, had a lot to do with this view, for it was almost universally believed that no crops could be grown without irrigation. While even then this was actually being done here and there, the general public was not aware of the fact and the owners of cattle and sheep monopolizing the plains for pasture were not admitting, even to themselves, that the country was good for anything but grass.

FARMERS WIN WATER FIGHT

Reference has been made to the question of royalty on water. This question was decided by the State Supreme Court in January, 1888, favorably to the contention of the farmers, the opinion having been prepared by Judge Helm in the case of Wheeler vs. the Northern Irrigation Company, commonly called "the English company." This company then owned the High Line Canal, beginning at the mouth of Platte Canon, the promotion figure claiming that it would irrigate one million acres, more or less, of arable lands in the counties of Douglas and Arapahoe.

Claim was set up to the absolute ownership of water and a charge was made of \$10 to \$30 an acre as royalty, for the privilege of using the water carried by the canal. Contracts including the royalty clause were made



Halligan Dam of the North Poudre System, in Larimer County. An arched concrete structure which impounds 6,428 acre-feet of water. Length at top, 350 feet; at bottom, 235 feet. Height, 94 feet; depth of water stored, 69.8 feet. Total cost of dam, \$230,000.

with the farmers. Dr. B. A. Wheeler refused to pay royalty and thereupon he was notified that he could have no water. He petitioned the Supreme Court for a writ of mandamus, compelling the company to furnish water. The court refused to grant the writ "for want of original jurisdiction." Wheeler then filed suit in the District Court of Arapahoe County, and after the case was argued at length the judge refused to issue the writ, holding

that "royalty" was in the nature of an advance payment for water. This was the ground that attorneys for the company took. Wheeler then appealed the case to the State Supreme Court, with the result of a reversal of the district court's decision and the granting of the writ. This was hailed as a decisive victory for the farmers, and an epochal decision.

GRANGE OPPOSES ROYALTY.—The Colorado State Grange was responsible for focusing attention of the water-using farmers on the evils of corporate control of irrigation systems, fighting the anti-royalty bill through the legislature to final passage and sponsoring also the work of a separate organization called the Farmers' Irrigation and Protective Association. This association was organized in 1886 and during the few years of its existence the legislature and the public in general discovered, for the first time in the state's history, that farmers were good crusaders and worthy foes in a fight involving their rights. Passage of the anti-royalty bill, together with the decision of the State Supreme Court, resulted in abandonment of plans for extensive canal building in the Arkansas Valley, for which companies financed by British capital had already been chartered.

STATE OWNERSHIP FAVORED.—The Grange, at its annual session in 1888, pointed with pride to these accomplishments, a resolution declaring that every member of the executive committee of the Protective Association was also a Granger. At this session the Grange went on record favoring state ownership of canals and federal aid in construction of storage reservoirs, the resolutions reading as follows:

RESOLVED: That in view of the fact that a large portion of our state must remain forever barren and worthless unless some plan to water the same can be found and carried into effect. We believe that the reservoir idea is the only way by which it can be done. That this is too vast an undertaking for private capital and too precious to be trusted to corporations. Therefore, we ask of the general government the donation of the arid lands of our state, that the proceeds arising from the sale of the same may be sacredly devoted to the redemption of the broad acres awaiting only the action of water to render them fertile and fruitful as any land under the sun, and thus make hundreds of thousands of happy homes of what is now a desolate waste.

RESOLVED: That we again affirm our oft-repeated resolution in favor of state ownership of ditches for irrigation, domestic and drainage purposes and do hereby declare that we will vote for no man for a legislative office unless he shall favor and vote for a bill to that end.

Incidentally, the farmers carried their victorious fight against royalty into the campaign of 1888, publishing a list of their friends and enemies; that is, the members of the legislature who voted for the measure and those who were against it. Although they won their fight they wanted punishment at the polls for any member of either house who stood with the corporations in favor of exacting a royalty on water.

DITCH COMPANIES COMMON CARRIERS.—Following success in the legislature, the decision of the Supreme Court in the Wheeler case climaxed

the efforts of the farmers and settled the fact that ditch companies were common carriers and that they have no property interest in the waters of the state, hence can charge no royalty and can make only a reasonable charge for carrying and delivering water to consumers. The farmers were jubilant, for thus ended an era of uncertainty for agriculture. In some quarters the action of the legislature and the court decision were viewed with alarm, as it was feared that capital would be driven from the state. In the final analysis what happened was that inflation and speculation were curbed and development proceeded along safer, if slower, lines.

MEAD'S FIRST BULLETIN.—As in the beginning, so during later years, when agricultural development was steadily going forward, consideration of ultimate possibilities in the use of water was found helpful in planning for the future. Elwood Mead, who has since become world-famous in land settlement and in the development of great irrigation works in this country and Australia, in 1888 was professor of Physics and Engineering at the State Agricultural College. He was author of Bulletin No. 1 issued by that institution which dealt with the climate, and reported on irrigation experiments and investigations conducted during 1887 at Fort Collins. The course of irrigation engineering had not yet been established. Nevertheless that branch of engineering was recognized as highly important.

"The rapidity of the development of our irrigation interests by a people ignorant of the practice," said Mead in the bulletin, "is without a counterpart, and has opened up many problems whose solution is urgently required, but which will require years of painstaking investigation. * * *

"While the settlement of all new countries produces a greater or less disturbance of existing conditions, the transformation wrought in the arid regions by the development of its agriculture by irrigation, is without a parallel. The widespread belief that this has, or is likely to result in a material change in our climate has aided in the agricultural development of the eastern part of the state, where irrigation is not possible. The question of a change in climate can only be answered by careful observations running through a series of years."

It has been answered, negatively, by the records of the United States Weather Bureau, through the seasons that have elapsed since Bulletin No. 1 was issued.

ESTIMATE OF IRRIGATION POSSIBILITIES.—Shortly after this bulletin was published Professor Mead delivered an address before a farmers' gathering in which he gave it as his opinion that the area then under irrigation in Colorado (1888) was one and a quarter million acres, though this, he said, was merely an estimate, as statistical information was lacking. This area was watered from canals whose aggregate capacity was

about 40,000 cubic feet per second, the capacity of these canals being largely in excess of the area irrigated. Mead asserted that the capacity of the canals already constructed was sufficient for irrigating three million acres, estimating the duty of water at one cubic foot per second for eighty acres.

"It is apparent," he told the farmers,* "that we have already made provision for more than doubling the area at present under cultivation, and only await the incoming tide of emigration from the East and South."

He pointed out that the exhaustion of canal capacity would not mark the ultimate extension of irrigation. "While on some streams in the northern and eastern part of the state the capacity of the canals equals or exceeds the discharge of the streams, there is still a large surplus of unappropriated water and available land in the west and south, the utilization of which is only a question of time. Without going into detail as to the location and value of these streams, I believe it to be a conservative estimate to place the amount of land susceptible of being brought under cultivation by irrigation at between four and five million acres. This is an agricultural area greater than that of either Massachusetts, Rhode Island, Connecticut, New Jersey or Delaware."

CONFIRMS PIONEER ESTIMATES.—Nearly thirty years had elapsed since that first estimate of four and a half million acres was made, as mentioned at the opening of this chapter, and Mead, without knowledge of or reference to the vision of the pioneer, fixed approximately the same figure. According to United States Census figures, the decade from 1880 to 1890 witnessed the heaviest investments in irrigation development in the state, this being due to corporation activities. This development was hailed with delight, and while fruitful of results in the long run, it was then beyond immediate needs and, as already stated, fraught with loss to the investors and discontent among water-using farmers because of the terms on which water was to be sold. The decision against royalty brought relief and emphasized the need for state supervision of water resources and for more economy in use, these things being set forth with clarity in the historic address of Elwood Mead, from which further quotation is made:

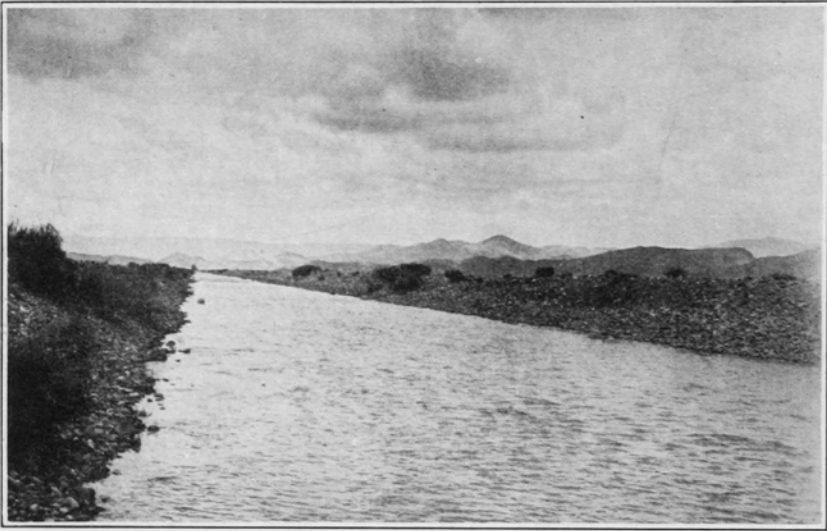
ELWOOD MEAD'S HISTORIC ADDRESS

Of the matters that demand our immediate attention, I can only indicate a few, the first of which is the conservation of our water supply by more effectively retaining the snow on the mountains. How to prevent the deforesting of the mountains is one of the most important economic problems confronting us. We need to stop mountain fires, the mountain sawmill and the railroad tie cutter. Every acre of forest shorn from the high mountain ranges means a loss of more water for late irrigation than an acre reservoir in the valley will impound. Let the construction of reservoirs wait; what we want first is the preservation of the natural ones. If we

*The Colorado Farmer, February 2, 1888

can keep the sides of our mountains covered with timber we won't need a mountain reservoir for the next decade. But let the sun's rays fall directly on their bare and blasting sides and all the reservoirs in Christendom would fail to give us a satisfactory water supply. We need to din this matter into the ears of the general government and to insist that it shall either effectively attend to this matter or turn it over to the state, which will.

We need also to correct the abuses which have fastened themselves on our methods of distributing water, and which for the past five years have operated as a bar to immigration and threatened the very prosperity of our agriculture. I refer to the inequitable water contracts and oppressive charges of many of the canals engaged in the business of selling water. You are all familiar with the enormous development of canal construction which followed the belief that appropriations from the stream



Canal No. 1, Rio Grande System at Del Norte.

conferred absolute ownership on the canal. Between 1880 and 1885 many parts of the state were gridironed with canals built in advance of their need, simply and solely because of the belief that by thus securing possession of the water supply they controlled the values of all the land tributary to their ditch.

You all know the results; the price of water rose steadily with the value of land; \$10, \$12, \$15, \$20 per acre for water rights were the prices marked up each year, as the increasing tide of settlement made land more scarce and dear, until at last the charges became for most prohibitive. A fortune was necessary to begin farming in this new state, with its free land and state water. The poor man of the East seeking a home could not find it here, however much it was desired.

But the excessive charges were not the only, nor perhaps the most serious, evil of these corporation water contracts (I speak of these as past because I trust the recent decision of the Supreme court will put an end to many of them). I have yet to find a contract for the sale of water whose provisions are fair toward the buyer, or that offers any incentive or inducement to secure its economical use. * * *

DUTY OF THE STATE.—Next to the obligation to husband the sources of water supply, it is the duty of the state to foster its economical use and to restrict, and if possible prevent, everything which encourages wasteful and pernicious habits. The way to accomplish this is to adopt a system of delivering water that will make it to the interest of the individual irrigator to practice economy. Throughout all irrigated countries it will be found that the duty of water is high or low precisely in proportion

to the incentive offered the irrigator to save or waste. Where it means a saving of money to make a small amount of water suffice, the duty will be larger. But where water is sold, as with us, by the area or crop watered, there will be waste and low duty. A recent writer, in speaking of this, truly says: "Neither climate, soil, crops, rainfall nor the intelligence of the irrigator will in the least account for the vast difference between the duty of water in Spain and Colorado. Spain gets a duty of 140 acres per cubic foot per second; Colorado one of fifty-six (we do better than that now), and the sole reason is that in the early days it was the custom in Colorado to use and waste water at that rate—and larger and later canals have encouraged it by selling water by the area irrigated." These conclusions are as much in accord with common sense as they are strongly supported by human experience, and I might add further that not only the extension of our irrigated area but justice to the saving and industrious irrigator, as against the improvident and slothful, demands this reform. The present system puts both on the same basis.

Without discussing this subject further, it is clear that much remains to be done that can be trusted to no less authority than the control of the state, and that the sooner its definite and fixed policy is determined upon the better for all concerned. Whether we are to have state ownership of canals, as in Egypt, Italy and India; a mixed system of state ownership and government aid as in France and Australia, or private ownership of canals under rigid state regulation and supervision is not so important as that we should have one of the three. I regard it of the highest importance that there should be early but intelligent action on this matter.*

Mead suggested the appointment of a commission of farmers, lawyers and engineers to investigate needs and frame a code to be submitted to the legislature, defining the policy of the State in reference to irrigation.

INTERSTATE WATER RIGHT QUESTION

The question of interstate water rights was raised in 1897 by the suit of the United States against the Rio Grande Dam and Irrigation Company. Colorado and New Mexico were the states affected. This litigation dragged over a long period of years. Any review of it would have to be legal, rather than agricultural, and it is not essential to the purposes of this history to go into the minute legal details. International rights were involved, as the Rio Grande forms the boundary between the United States and Mexico for a distance of nearly one thousand miles. The government's contention was that the building of a private dam at or near El Paso would interfere with navigation on the lower reaches of the Rio Grande. Criticism of the government at this time was severe. It was charged that the federal government or its officers were being used as instruments to kill off a legitimate corporate enterprise of vast magnitude, in the interest of a rival scheme, known as the International Dam, in the aid of which its promoters had asked Congress for an appropriation of \$2,317,000.

RIO GRANDE LITIGATION.—In a lecture delivered by William Russell Thomas of Colorado before the University of California, August 6, 1902, litigation over the waters of the Rio Grande was discussed at some length.† Extracts from this lecture follow:

*Colorado Farmer, February 2, 1888.

†William Russell Thomas, Litt. D., was then on the editorial staff of the Rocky Mountain News, but later became professor of Constitutional History and Irrigation Law at Colorado Agricultural College.

In this valley of the Rio Grande about Mesilla, irrigation on the North American continent was first practiced. The valley was first penetrated by Coronado in 1541-2 and soon afterwards settled by the Spaniards and has been continuously irrigated ever since, a period of approximately 350 years. Not until about 1850 did the Spanish settlements reach the San Luis Valley, then a portion of New Mexico, the oldest known water right in that valley under Mexican occupation having been made in 1852, near the Plaza of Conejos.*

In 1896, according to a report made by W. W. Follett, a civil engineer, under direction of the War Department, the appropriations of water from the river amounted to 12,700 second feet, made by 925 ditches and actually irrigating that year 320,000 acres of land. The same authority gives the number of ditches in New Mexico in use in 1896 as 603, with an aggregate carrying capacity of 6,000 second feet, and watering 187,000 acres. The irrigation methods of New Mexico, it may be mentioned here, are still largely in the crude state in which they came down from the 16th century. No valley in the whole arid region, both as to fertility of soil, variety of products, or excellence of climate, offered greater inducement for irrigation enterprise and investment than did the Valley of the Rio Grande. Certain citizens of New Mexico at last succeeded in interesting a number of wealthy English capitalists in the opportunities thus presented, and in 1893, the Rio Grande Dam and Irrigation Company was organized. According to its prospectus, issued in London, where its stock and bonds were being floated, the company proposed to construct a dam in the valley of the Rio Grande at Elephant Butte in Sierra County, New Mexico, 125 miles north of El Paso. This dam was to be sixty feet high and would have created a reservoir 15 miles long, 7 miles wide, with an average depth of 30 feet, impounding over 11 billion cubic feet, or 253,370 acre feet of water, and being the largest artificial lake in the world. It was estimated that 530,000 acres of bottom and mesa lands could be brought under the influence of water, and as fertile and productive a valley as lies within the confines of the United States reclaimed for the highest possible development of agriculture and horticulture. It was an alluring scheme, fraught with far-reaching possibilities on the industrial future of New Mexico.

GOVERNMENT STEPS IN.—Active operations were begun, but on May 24, 1897, the company was enjoined from further prosecution of work by a writ of injunction, issued at the instance of the Attorney General of the United States. The government's complaint that the proposed dam would destroy navigation on the Rio Grande was considered preposterous and the suit was first regarded as a joke. However, it was soon evident that the government meant to stop the work if possible. An order came from the Secretary of the Interior, withdrawing approval for all reservoirs and all rights-of-way for canals on the public lands within the watershed of the Rio Grande. This action created alarm, both in Colorado and New Mexico.

GOVERNMENT LOSES ITS SUIT.—The case came up for hearing before Judge Gideon D. Bantz of the Third Judicial District of New Mexico, and that court found against the government on every point, dissolving the injunction and dismissing the complaint. Appeal was taken to the Supreme Court of New Mexico, where the government again lost, when the case was taken to the United States Supreme Court. The opinion of Chief Justice Thomas Smith of the New Mexico Supreme Court included the following significant statement:

*The year 1852 is correct, but the first decrees for San Luis Valley water were granted for ditches at the San Luis settlement and not on the Conejos, where irrigation started two or three years later.

If the waters of the Rio Grande are not navigable in New Mexico, which we hold to be the case, then they cannot be said to be waters in respect of which the United States has jurisdiction. And certainly, in the absence of some express declaration to that effect, it cannot be supposed that Congress intended to strike down and destroy the most important resources of this vast region in order to promote the insignificant and questionable benefit of the navigation of the Rio Grande, for a short distance above its mouth. For the construction contended for does not limit the prohibition of the acts of Congress to the works proposed by the defendants. It applies to the maintenance, as well as the original creation of obstructions. If defendants' dam at a point where the river is not navigable is an obstruction to the navigable capacity of the river several hundred miles below, the same must be said of every dam and irrigation ditch which diverts water from the river, or any of its confluent at their primary sources. If upon this ground it is competent for the United States to prohibit the erection of defendants' dam, it is equally competent for it to compel the removal of every dam and headgate heretofore constructed on the Rio Grande and its tributaries and prohibit the use of their waters for irrigation throughout this entire valley.

JUSTICE BREWER'S OPINION.—The decision of the New Mexico court was upheld by the United States Supreme Court, and on May 22, 1899, Justice Brewer delivered the far-reaching opinion affecting the future of irrigation litigation discussed by Dr. Thomas.

He (Justice Brewer) held that the courts can take judicial notice that a river is navigable, but not of the fact at what point between its mouth and its source navigation ceases, that being a fact to be determined by evidence unless it is a matter of general knowledge. "Obviously, the Rio Grande within the limits of New Mexico," says Justice Brewer, "is not a stream over which in its ordinary condition trade and travel can be conducted in the customary modes of trade and travel on water." * * * Passing to a discussion of the doctrine of riparian rights, Justice Brewer admitted the power of states to change the old common law rule as to streams within its dominion, but asserted that this right was subject to two limitations:

1. "That in the absence of specific authority from Congress a state cannot by its legislation destroy the right of the United States, as the owner of lands bordering on a stream to the continued flow of its waters, so far at least as may be necessary for the beneficial uses of the government property; and

2. "That it is limited by the superior power of the general government to secure the uninterrupted navigability of all navigable streams within the limits of the United States. In other words, the jurisdiction of the general government over interstate commerce and its natural highways, vests in that government the right to take all needed measures to preserve the navigability of the navigable water courses of the country even against any state action."

LITIGATION WAS CONTINUED.—Litigation did not end there. In fact, it followed the usual course and the question remained in abeyance until a more rational plan for settlement was tried. The rights of the two nations, Mexico and the United States, were settled finally by a convention providing for the equitable distribution of the waters of the Rio Grande for irrigation purposes, made May 21, 1906. (Malloy, *Treaties*, Vol. 1, p. 1202.)

The Elephant Butte Dam was built by the U. S. Reclamation Service, and the project developed a successful agricultural community. While this ended the matter as between the two nations, there still remains a controversy between Colorado and New Mexico, which is now under negotiation by treaty under the Seven States Compact.

KANSAS-COLORADO SUIT

Colorado's development of irrigation waters again became the subject of interstate controversy about 1900. Suit was brought by the State of Kansas in 1904, seeking to show that Kansas had been damaged by depletion of the flow of the Arkansas River. The opinion handed down by the United States Supreme Court in 1907 declined to give Kansas a decree, though holding that perceptible injury had been done a portion of the Arkansas Valley in Kansas.

While thus legally undecisive, the suit nevertheless brought out points that have since had their bearing on water development and are of historical interest. This is true of the contention of Colorado that the Arkansas partakes of three distinct characters in its flow from mountain sources to its junction with the Mississippi River. This is a peculiarity also of other western streams rising in Colorado, differing thus from the type of water courses common to regions of a sub-humid or humid climate.

PROFESSOR CARPENTER'S TESTIMONY.—In the testimony of Prof. L. G. Carpenter, former State Engineer and the first professor of irrigation engineering in the United States,* appears a detailed description of this peculiar character of the western rivers. The testimony was given before Granville A. Richardson, Commissioner of the United States Supreme Court, in October, 1904.

Carpenter started his description with the Arkansas at its source, where it is fed by perennial mountain streams that form its headwaters. This type of feeders continues down to Salida, where the South Arkansas enters the main stream. Below that point to Canon City are several feeders which he termed of transitional character; not perennial mountain streams, nor yet of the plains type. These transitional branches are supplied by melting snows and mountain rain storms, being without flow in the dry seasons of the year. Farther down stream enter the Fountain,† the Huerfano, the St. Charles and the Purgatoire, which rise in the mountains from perennial feeders, though, on passing out upon the plains, they sink in the sand, their upper flow not reaching the main stream. Still farther down stream are a series of so-called streams, which, Professor Carpenter said, are really dry channels or arroyos, carrying a flow only in time of great rainfall or freshet. The Arkansas maintains the character of a plains stream through western Kansas and until it reaches a point about Hutchinson, where it is again fed by living branches, assuming then the type of streams usual to sub-humid and humid regions.

*L. G. Carpenter was made professor of Irrigation Engineering at the State Agricultural College in 1886.

†In the less hurried days of pioneering, this stream always was dignified by its complete name, *Fontaine qui Bouille*.

The testimony indicated that this same description applied, in effect, to the Platte and the Rio Grande, each changing character along its course, fed first by perennial mountain streams, then by intermittent branches, next traversing the dry plains where there are no living streams as feeders, hence diminishing in flow and at certain seasons having no visible flow, and again lower down resuming the character of a running stream with the change in climatic conditions of the region drained.

PIKE'S JOURNAL AS EVIDENCE.—The purpose of this testimony was to show that Colorado's use of the headwaters had, in fact, caused no change in the character of the Arkansas after it crosses the Kansas border. In support of this the records of the early explorers were read into the testimony. Lieutenant Zebulon M. Pike, commissioned by the government to explore the Red River and the Arkansas in 1806, reached the latter stream about where the town of Great Bend, Kansas, now is. An entry in his journal is as follows:*

It has one singularity which struck me very forcibly at first view, but which, on reflection I am induced to believe is the same case with all rivers, which run through a low, dry, sandy soil in warm climates, as I observed to be the case with the Rio del Norte, viz.: For the extent of four hundred or five hundred miles before you arrive near the mountains, the bed of the river is extensive and a perfect sand-bar, which at certain seasons is dry, or at least the water is standing in ponds not affording sufficient to procure a running course; but when you come nearer the mountains you find the river contracted, a gravelly bottom, and a deep, navigable stream. From these circumstances it is evident that the sandy soil imbibes all the (not evaporated) waters, which the sources project from the mountains, and renders the river in dry seasons less navigable 500 than 200 miles from its source.

Pike's Journal was edited by Elliott Coues, an army surgeon, who, in a note of his own, which was written on June 3, 1864, when he was traveling along the Arkansas, describes the river thus:

Our route since leaving Larned has been mostly along the north bank of the Arkansas. Queer river that—a great ditch, chock full of grassy islets stretching through the treeless prairie like a spotted snake, some seasons so dry you cannot wet your foot in it for miles, and have to dig for a drink, sometimes a raging flood two hundred yards wide.

EDWARD E. HALE IS QUOTED.—Another citation incorporated in the testimony was the description by Edward Everett Hale in his "Kansas and Nebraska" (Phillips, Sampson & Co., Boston, 1854.), who says:

The lower part of the valley of the Arkansas is, as is well known, a rich and fertile country. That part of its valley, however, which lies in Kansas, is not well wooded. Though fertile farms have been established in the immediate vicinity of the river, it does not appear to be in general a promising agricultural region. In the neighborhood of the Pueblo, tall woods line the river with green meadows on either side. The crops raised there are abundant. At Bent's Fort there is but little timber. Timber sometimes appears in small sections; but in general for several hundred miles the river is, most of the year, a broad sand bed, over which a few threads of water glide along, occasionally expanding into wide shallows. In the autumn the water sometimes sinks into the sands and disappears altogether. At the Big Timbers, about

*"The Expeditions of Zebulon M. Pike," Vol. II, p. 520, Francis M. Harper, New York, 1895.

thirty-five miles below Bent's Fort, the river widens, and the banks on each side fall towards it in gentle slopes. The "timber" is a thinly scattered growth of large cottonwoods, not more than three-fourths of a mile wide and three or four miles long. "The bed of the river," says Col. Emory, "is seldom more than 150 yards wide, and, but for the quicksands, is everywhere fordable."

POWELL'S POINTED STATEMENT.—Perhaps the most pointed and direct documentary statement produced by Carpenter in his testimony in regard to the character of the streams was a quotation from Senate Executive Document 120, Vol. 3, Fiftieth Congress, Second Session, being from a report of the United States Secretary of the Interior:

The irrigating season on this river is on an average something more than two months, while the waters run to waste for more than nine months. It is this waste water that is to be stored in the mountains. Whatever is thus stored will decrease the volume passing the Kansas-Colorado line during the non-irrigating season, but will greatly increase the volume passing that line during the irrigating season; and, as in the case of the South Platte, the prospect for irrigation in western Kansas depends upon the storing of water in Colorado. The greater the storage, the greater will be the area irrigated in Kansas. * * *

It must be remembered that the Upper Arkansas, the North Platte and the South Platte are not navigable streams. They are exceedingly broad, muddy rivers, having great declivity and so shallow as to be practically impossible for even canoes during the greater part of the year. They are thin sheets of mud, tumbling down a highly inclined plain; so that the interests of navigation are in no way affected by the use of these streams for agriculture. * * *

From the above statement it will appear that the question of the use of the Platte Rivers and of the Arkansas is one affecting agriculture only, and that the amount of irrigable lands redeemed in Nebraska and Kansas by the waters of the Platte and Arkansas depends upon the amount of water stored in Colorado and Wyoming.

This statement bore the signature of J. W. Powell, Director.

STREAMS CHANGED THEIR CHARACTER

Changes that have occurred in the character of the Fountain, the Purgatoire and the Chico, due to the removal of protective forests on upper reaches of these streams and the ground cover adjacent to them, were described by Professor Carpenter in his testimony. He declared that the Fountain could once be spanned by an ordinary log, but that now it was several hundred feet wide. He said the same of the Purgatoire, and of the Chico that it had cut a deep channel into the plains. He said there were many little channels east of Pueblo that now are ten, fifteen or twenty feet deep, with vertical sides, cutting up the plains into a great many sections difficult to cross, which were not of that character in the early times. They were not channels at all then, but simply depressions.

DEFORESTATION RESPONSIBLE.—"And these have been some of the changes," Carpenter declared, "that have taken place, due to the denudation of the forests and the grazing off of the grasses, both of which were protective."

This has had the effect of modifying the flow of the Arkansas, according to his statement. "In the forest areas particularly the cutting off of the for-

ests has not only changed the character, but has decreased the flow because of the wind effects; that is, by permitting the snow to evaporate. On the plains I am not quite so sure as to the sum of these influences; that is, whether it has so decreased the total quantity, but it certainly has changed the character of the water supply of the plains."

DISASTROUS FLOODS OCCUR.—The witness went on to explain that the tendency is to make the streams come down in floods, where formerly they had come with a steadier flow, though not in constantly running streams. Early travelers, describing these streams, spoke of them as being running streams, while they are now beds of sand.

"It has changed their character," said Carpenter, "and there seems to be ground to think that the floods are more severe than formerly. We have had several floods at this particular season. The late Trinidad flood is a marked instance. The Eden flood, which caused the wreck on the Rio Grande was also in one of the obscure channels that one would scarcely think of. Originally the bridge was a few feet wide; they have been constantly increasing the size of it until now it is a hundred feet wide and still not wide enough to take care of the discharge. The ditch men in the eastern part of the state are inclined to look with alarm if they see a dark cloud upon the divide which runs water down into the region where their ditches are, for fear that a flood will come, and they have abundant reason to fear it. Now, while there were floods in former times and sometimes great floods, yet I think we have reason to notice this change as a consequence of that degrassing of the plains."

THE PUEBLO FLOOD.—That testimony was given in 1904. The disastrous Pueblo flood of 1921 owed some of its volume to the causes here described. This flood caused considerable loss of life, and damage to the city of Pueblo and surrounding farm lands running into the millions. Foresters who examined the feeder streams after that flood were of the opinion that its severity was augmented by the fact that adjacent ground had been denuded of brush and grass and the drainage area at the headwaters stripped of trees. Entire farms were covered with silt, and reclamation of this land after the flood became a task requiring several years. Thus in the course of development physical features of the landscape, the very geography of the country, have been altered by the hand of man.

CONTENTION IS NOT SUSTAINED.—The opinion of the United States Supreme Court handed down in 1907 in the Kansas-Colorado case, declared that the contention of Colorado of the double character of the streams—or really of two streams, as the court expressed it—was not sustained. Quoting: "That the appropriation of the waters of the Arkansas by Colorado for purposes of irrigation has diminished the flow of water into the

State of Kansas; that the result of that appropriation has been the reclamation of large areas in Colorado, transforming thousands of acres into fertile fields and rendering possible their occupation and cultivation when otherwise they would have continued barren and unoccupied; that, while the influence of such diminution has been of perceptible injury to portions of the Arkansas Valley in Kansas, particularly those portions closest to the Colorado line, yet to the great body of the valley it has worked very little, if any, detriment, and regarding the interests of both states and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree. At the same time it is obvious that if the depletion of the waters of the river by Colorado continues to increase, there will come a time when Kansas may justly say that there is no longer an equitable division of benefits and may rightfully call for relief against the action of Colorado, its corporations and citizens, in appropriating the waters of the Arkansas for irrigating purposes."

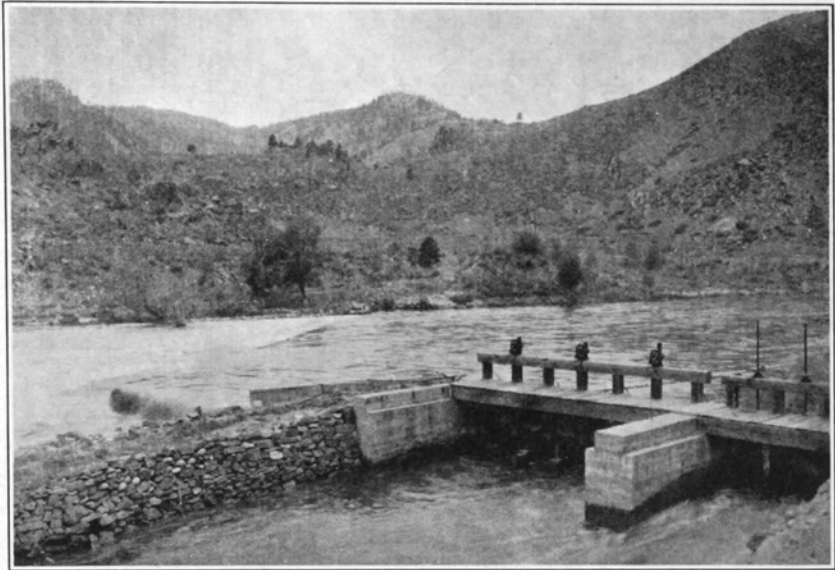
The decree dismissed the petition against the defendants, without prejudice to the right of the plaintiff, Kansas, to institute new proceedings whenever Kansas shall be injured to the extent of destroying the equitable apportionment of benefits between the two states. The decree also required each state to pay its own costs. There the controversy has rested ever since.

THE WYOMING-COLORADO CASE

The Wyoming-Colorado Water Suit, another noted case, involving interstate rights, was brought by the State of Wyoming in 1910. Diversion of the waters of the Laramie River to the Cache la Poudre watershed was involved. Wyoming's contention was that these waters had been appropriated years before by residents of Wyoming. The United States Reclamation Service intervened, claiming that the water belonged to the United States. The land area affected in Colorado was approximately 100,000 acres in Weld County. The water diverted through Green Mountain Tunnel, located about 60 miles west of Fort Collins, was carried by the Cache la Poudre to the mouth of Poudre Canon, where the diversion dam and headgate are located that take it out over the plains to the vicinity of Nunn.

WATERS BELONG TO COLORADO.—Colorado's contention was that the waters of all streams having their source within the state belong to Colorado. Wyoming, as above indicated, contended for priority of use, irrespective of state lines. After several years of litigation, the United States Supreme Court sustained the contention of Wyoming, holding that as between states, he who first appropriates the water of a stream for beneficial use becomes the owner of that water. The decision, rendered in June,

1922, enjoined Colorado from diverting more than 15,500 acre-feet per annum from the Laramie River, allowed the use of 18,000 acre-feet per annum through what is known as the Skyline Ditch and 4,250 acre-feet



Laramie-Poudre Irrigation Company's diversion dam on the Cache-la-Poudre, 12 miles northwest of Fort Collins.

through the Meadow Land appropriations. Costs were assessed one-third on Colorado, one-third on Wyoming and the balance on two corporations interested in the litigation.

HAS RIGHT TO DIVERT.—Colorado had sought to obtain 30,000 to 50,000 acre-feet. The state won on the contention that Colorado has a right to divert from one watershed to another within the state, but lost on the argument that rights between states should be settled by equitable apportionment. Colorado contended that the issues were identical with those of Wyoming and that Wyoming's victory on the prior rights feature throws that question open to litigation on all streams originating within Wyoming.

REVIEW OF IRRIGATION LAW

A brief review of irrigation law that follows is from an unpublished manuscript of 1904 of Dr. William Russell Thomas, at that time Professor of Constitutional History and Irrigation Law, at Colorado Agricultural College:

Irrigation law and practice in Colorado is a commingling of statute and judicial dicta, of precedent and usage. That the system, in its practicability, exists today is as effective as it has grown to be in the administration of water and in the security and protection of water titles, is a matter of surprise and may be cited as an illustration of the traditional capacity of the American people to work out fairly equitable methods, even in the face of defective, if not at times vicious, legislation. In no state had the courts exercised a more decided and wholesome influence over the development of irrigation practice, supplying by suggestion apparent defects in statutes and ruling wisely and liberally on those which admitted of a double construction. Thus, under the statutes of 1879-1881, it might have been held that the great ditch companies were the real appropriators and proprietors of the water carried in their canals, but in two controlling cases, decided in 1888 and 1889, the Supreme Court declared that they were common carriers only, and that the carrier cannot become the proprietor of the water diverted. The far-reaching effect of this opinion in preventing a monopoly of water in Colorado has hardly yet been appreciated by the people of the state. * * *

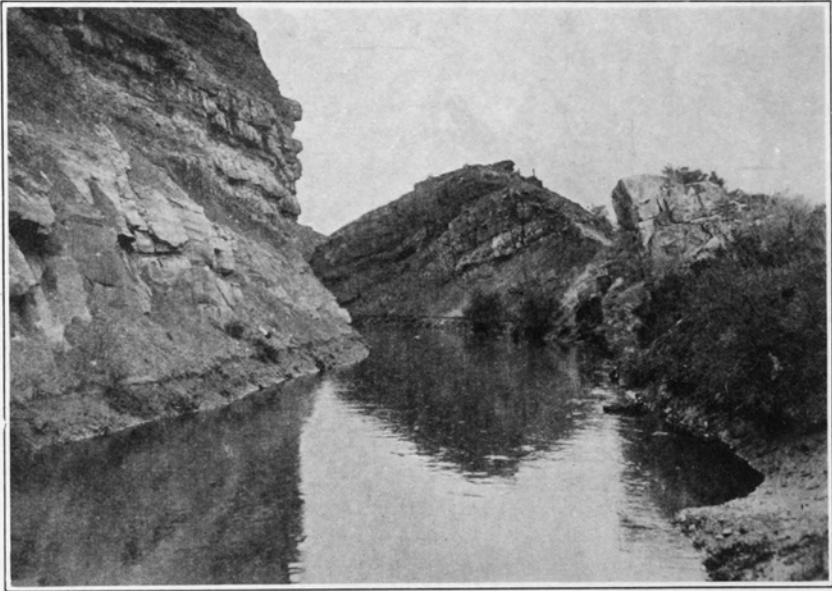
Appropriations of water in Colorado for irrigation began as early as 1859-60 and were made substantially under the rules and regulations of mining districts. In 1861 the first territorial legislature passed a statute which permitted the use of water for irrigation but which required no record of the appropriation. In many instances, records were made and notices posted in accordance with the custom of the miners; but in those days water was abundant and the irrigated area slight. The ditches were small; the farms lay on the bottoms along the immediate banks of the streams, and every irrigator got all that his ditch would carry and sufficient for all his needs. That the irrigated area within two decades would tread closely on the water supply and that an equitable public administration would be required in order that the rights of all as determined by their respective priorities, might be conserved was an idea that now presented itself to the pioneer farmers of Colorado.

The absence of any additional territorial legislation may in a measure perhaps be accountable for the sense of security engendered by the Act of Congress, approved July 26, 1866, which provided "That whenever by priority of possession, rights to the use of water for mining, agriculture, manufacturing, or other purposes has vested and accrued, and the same are recognized and acknowledged by the local customs, laws and the decisions of the courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purpose of aforesaid is hereby acknowledged and confirmed." This Act was amended in 1870 by the addition of six sections, Section 17 reaffirming the above provisions and making all patents to lands issued subject to any vested or accrued water rights, or rights to ditches and reservoirs used in connection with such water rights, as may have been acquired under, or recognized by, the 9th Section of the Act of 1866.

PUBLIC OWNERSHIP OF WATER.—In 1876, Colorado was admitted as a state, with a constitution which declared the public ownership of all unappropriated water and the doctrine of priority of appropriation for beneficial use. But prior thereto, in 1870, the coming of the Union Colony had resulted in the construction of larger irrigating canals, which covered the uplands along the Cache la Poudre. This led to an era of canal construction such as the state had never before witnessed, with consequent conflicts for water which precipitated a general public discussion and consideration of the whole irrigation situation. The legislative result was the Act of 1879, followed two years later by the Act of 1881, the latter being so supplemented to the former, that the courts have practically construed them as one Act.

These two laws are era-making enactments in the history of irrigation legislation, as being the first to provide for the public administration of water used for agricultural purposes. Their provisions are, therefore, of more than ordinary interest. Of course, as all new statutes are, they were crude in many ways; but they were a start and in the right direction. They began with water districts in 1879 and ended with a grouping of districts into divisions and a state engineer in 1881. * * * Let the fact be noted that Colorado was the first state to create water districts, water divisions and the office of state engineer, with a supervising control over the public waters and their diversion for purposes of irrigation. These two Acts provided (1) for the acquisition of titles to water rights; and (2) for the administration of water so that each appropriator might receive his proper amount.

For the adjudication of titles and the determination of priorities, the system of district court decrees was devised. This process is now so familiar that it need not be described at length; and while it may now be pronounced both cumbersome and antiquated, it was at the time a progressive step in the solution of water problems. It is judged today by its absurd and unequal decrees, and by some of its pernicious results, rather than by the new security that at the time it gave to appropriators. The chief merit of these statutes was that they inaugurated a system of public adjudication and control; the chief defects were that they permitted the most ridiculous conclusions and decrees on the part of the courts. On testimony that was seldom or never of expert character, that was usually wanting in exactness, and that was not infrequently manufactured, various streams were adjudicated and decrees granted for many times the amount of water they contained at their normal stage. The result has been to fill the pages of the court reports with irrigation decisions, and continuous litigation of the most expensive character. Still, Colorado clings to the system and may always do so, since the normal flow of all her streams on the eastern slope of the mountains at least has been appropriated and decreed. This same system is now being invoked to determine reservoir priorities. * * *



An irrigation canal blasted and dug through shale and sandstone foothills, conveying water of the Laramie-Poudre system out upon the Weld County plains.

CENTRAL AUTHORITY NEEDED.—The first attempt to administer water and to distribute the amounts decreed by the courts was by the district commissioners, created by the Act of 1879, which now number 69. Two years' experience demonstrated the absolute necessity for some central authority to control and direct the operations of these commissioners, if anything like an equitable distribution was to result from the public administration of water. In 1881 the water districts were grouped into divisions—of which there are now five—with a superintendent in authority over the commissioners and a state engineer in authority over the superintendents. The state engineer, division superintendents and district commissioners were all appointed by the governor—the state engineer for a term of two years at a salary of \$3,000 per year.

This system remains substantially the same as originally adopted, save a constant tendency on the part of the legislature to extend the duties and responsibilities of the

state engineer. This was notably the effect of the Act approved March 30, 1889. In 1891, an Act was passed permitting canal and reservoir companies to extend their corporate existence. In 1893, it was enacted that the conveyance of water rights, except when the same was in the form of ditch stock, should be attended with the same formalities as in the case of real estate. In 1895, an Act was passed, making it the duty of district commissioners to shut off water that was being "wastefully, extravagantly or wrongfully used." In 1897, the exchange of water between reservoirs and ditches was authorized. In 1899 it was enacted that persons desiring to change the points of diversion of their ditch from a stream should observe the same formalities in the district court, as if obtaining an original decree; and permitting such changes if the court shall first find that it "will not injuriously affect the rights of others." But in all this mass of original, revised and amendatory legislation how was the state engineer affected? (Then follows a statement submitted to the legislature by Professor L. G. Carpenter, summarizing the duties of the state engineer's office as outlined by the statutes, and a detailed discussion of these duties by the author of the bulletin.)

SETTLEMENT BY TREATY EFFECTIVE

Appeal to the courts for decision of interstate irrigation controversies having proved unsatisfactory, the idea of settlement by treaty was conceived, tried and found workable between sovereign states of the Union on the same principle as between nations. This method of adjustment of the right to the use of waters of interstate streams for irrigation has resulted in what is known as the South Platte Compact between Colorado and Nebraska and negotiations were in progress in 1926 involving the waters of the Colorado River in the states of Colorado, Wyoming, Utah, New Mexico, Arizona, California and Nevada. In the application of the treaty method, Colorado has led, the idea having been suggested and developed by Delph E. Carpenter, an irrigation lawyer, who is serving the state as commissioner in these negotiations.

NEBRASKA-COLORADO CASE.—Litigation between Nebraska and Colorado was begun in 1916 in behalf of the State of Nebraska, but in the name of the Western Irrigation District, to enjoin diversions of water made by certain water users in Colorado. The many ditch companies along the Platte in Colorado, who were made defendants, organized a protective association and employed attorneys and engineers to conduct their defense. In the course of preparation for the hearing, the attorney for Colorado water users suggested the treaty between the two states to settle pending litigation and other questions affecting the use of the stream. This plan was adopted and elaborate studies were made of the problems covering the entire river system. The South Platte Compact was formulated as a result of these studies and ratified by the Nebraska legislature in 1923 and by Colorado in 1925, though the interstate litigation was dismissed in 1923.

It is pointed out in the Colorado Proceedings,* covering the South Platte Compact that the problems of the Arkansas and the South Platte

*Colorado Proceedings, South Platte River Compact, Delph E. Carpenter, Commissioner for Colorado, January 7, 1925.

are quite similar; their sources are in the same region and they were characterized originally by the same type of disappearing flow. It required only seven years to settle permanently by treaty the South Platte problems and at a minimum of expense, while the Arkansas dispute between Kansas and Colorado has been in the courts more than a quarter of a century and is still unsettled.

From the Colorado Proceedings is taken this statement: "Authorities universally agree that the economic development of the lands of any stream basin by irrigation should commence at the headwaters and proceed gradually down stream, using and reusing the waters which return to the streams from the irrigated lands."

BENEFIT OF RETURN WATERS.—This sets forth a fact that early irrigators were not cognizant of. Early irrigation along the upper streams yielded large water returns. These return waters were diverted by lower ditches, applied to the land, and again yielded a return flow for further utilization. "As a result, the disappearing river no longer exists. It is now a stream of constant flow, to and across the interstate line, although its waters have been repeatedly diverted, used, rediverted and reused for irrigation of 1,500,000 acres. The return waters of the South Platte and of the North Platte have stabilized the flow of the main river below North Platte and have made possible the adjustment between states, with assurance of increased future development in Nebraska."

AN UNFORESEEN RESULT.—This unforeseen result of beneficial use of water in Colorado, where the Arkansas, Platte, Rio Grande and Colorado have their sources, these waters finally reaching both the Atlantic and Pacific oceans, more than justifies the millions spent for storage reservoirs and canals by private enterprise. Colorado is often referred to as the "roof of the continent" because its average elevation is higher than that of any other state or province in North America; a fitting appellation, for this roof sheds a continuous stream that makes life possible over a tremendous area, suggesting that the Centennial State might well be called the Mother of Waters.

DOMESTIC AND POWER SUPPLY.—While this history has to do with agriculture alone, it is well to remember that consideration of the life-giving streams and their changing character affects domestic water supply and power as well as irrigation of crops. More than half the people of Colorado are dependent for domestic water on the South Platte; more than half the state's taxable wealth is (1926) located in the South Platte drainage basin on the eastern slope of the Continental Divide. As Governor Oliver H. Shoup said in his message to the Twenty-fourth General Assem-

bly: "There is no question of more vital importance to the future welfare of our state than that of water."*

COLORADO RIVER PACT.—Unlike the South Platte Compact, that affecting the Colorado River has been formed in anticipation of development and prior to any further large construction and extensive utilization of these waters. This compact is to settle not only the questions affecting the seven states, but also the rights of the Federal Government. At a conference of the governors of these states, May 10, 1921, it was agreed to ask the United States for the appointment of a Federal commissioner to act with the state commissioners. Herbert Hoover, Secretary of Commerce, was designated by Congress as the government's representative on the joint commission.

As to the rights and powers of the national government in relation to irrigation from interstate streams, that point was decided in the Kansas-Colorado suit.

RIGHTS OF THE GOVERNMENT.—The report of the commissioner for Colorado on the Colorado River Commission (p. 30) presents the following digest of Justice Brewer's decision on the rights of the Federal Government:

In the case of *Kansas v. Colorado*, last above cited, the United States intervened, in effect claiming national control of the waters of Western streams to be administered under the doctrine of prior appropriation. In answer to the primary question of national control, regardless of the rights of the States, *inter sese*, Justice Brewer, after observing that the United States had an interest in the public lands within the Western States and might legislate for their reclamation, subject to State laws, thus disposed of the claim of national control of western interstate streams:

"Turning to the enumeration of the powers granted to Congress by the eighth section of the first article of the Constitution, it is enough to say that no one of them by any implication refers to the reclamation of arid land. * * * No independent and unmentioned power passes to the National Government or can rightfully be exercised by the Congress. * * * But it is useless to pursue the inquiry further in this direction. It is enough for the purpose of this case that each state has full jurisdiction over the lands within its borders, including the beds of streams and other waters. (Citing Cases). * * * It may determine for itself whether the common law rule in respect to riparian rights or that doctrine which obtains in the arid regions of the West of the appropriation of waters for the purposes of irrigation shall control. Congress can not enforce either rule upon any state. * * * One cardinal rule, underlying all the relations of the states to each other, is that of the equality of right. Each state stands on the same level with all the rest. It can impose its own legislation on no one of the others, and is bound to yield its own views to none." (*Kansas v. Colorado*, 206 U. S., 46, 87-97.)

SEEPAGE OR RETURN WATER

Reference has been made in the foregoing to "return waters." Irrigation near the headwaters of Colorado streams has increased the flow of such streams lower down. "Return waters" in this sense refers to water diverted from a stream and run over fields for irrigation, that finds its way back to the streams through percolation. This natural consequence of irrigation practice on porous soils has had a decidedly beneficial effect on the

*Senate Journal, 24th General Assembly, pp. 37-8.

streams where it has been observed. The extent of the return flow in quantity of water available for use on lands, the distance which is traveled by the water, the effect on the character of the main stream and the value of this "by-product" of irrigation, are subjects of constant study by experts in the application of water.

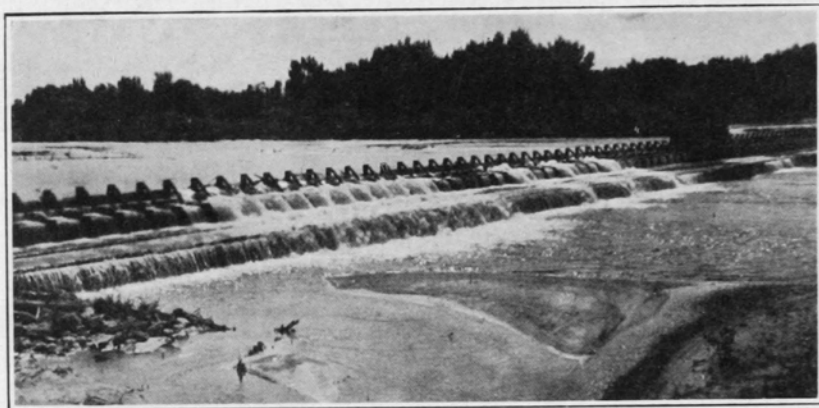
The irrigation section of the State Experiment Station has studied the phenomenon for years. Bulletins 33 and 180 on "The Seepage or Return Water from Irrigation" by L. G. Carpenter give an account of the extent of the return flow for short periods during the early nineties. Records have been kept by the State Engineer's office for some years which show that there is a gradual yearly increase in the return flow.

AN EXHAUSTIVE TREATISE.—The most exhaustive treatise on the subject is Bulletin 279, issued December, 1922, and entitled "Return of Seepage Water to the Lower South Platte River in Colorado" by Ralph L. Parshall. This bulletin points out that no other Colorado stream has such an abundant return flow as the South Platte and that the factors influencing this are the sandy nature of the soil, the liberal use of water in irrigation and the nearness of the irrigated areas to the river. The average annual flow of the South Platte River into Nebraska is 300,000 acre-feet, which, so the bulletin says, is very largely seepage. A large percentage of the return flow has been applied several times in irrigation, as the water passes down the valley. The extent of the flow is indicated by the fact that the many depressions and arroyas leading to the South Platte, in the early days dry except after heavy rains, now carry living and constant streams from irrigation seepage and waste water.

VALUE OF RETURN FLOW.—As to the value of this return flow, that is estimated for the lower Platte Valley by the author of the bulletin at \$3,000 per second foot. Based on a return flow from Kersey to Julesburg of more than 750 second-feet for the ten months, January to October, 1920, he estimates the water to be worth \$2,250,000 to the farmers of the valley. "At this time it is not known whether the peak of the return flow has been reached, but it is assumed that it has not and that in later years a greater flow may be expected, which, with other causes, may increase the total value to \$3,000,000 or more. The return flow to the river, aside from establishing a value of water rights, has without doubt greatly enhanced both general agricultural activities and business affairs of this part of the valley."

The return flow first began to attract attention about 1885 and it was then already of such importance that new canals were constructed to take advantage of it. The bulletin points out that, after the passage of the irrigation district law in 1901, a number of projects were proposed for the

Platte Valley, the promotion of which was looked upon with apprehension as to the possible water supply. However, since their construction, it has become apparent that in average years there is ample supply of water during the growing season, due to the return flow.



Prewitt diversion dam, North Sterling Riverside and Fort Morgan systems on the Platte. The discharge passing over the dam is all return seepage to the river. (Bulletin 279, Colorado Experiment Station.)

RESERVOIR STORAGE SYSTEMS

No better explanation of the reservoir system of the Cache la Poudre Valley has been given than that contained in a paper read by Horace G. Clark of Denver at the Nineteenth National Irrigation Congress in Chicago during December, 1911.*

Quotations from this address follow:

An observing passenger riding from Denver to Cheyenne on the Denver Pacific railway would notice, about one mile north of the city of Greeley, an insignificant looking little stream, scarcely entitled to be dignified by the name of river, approximately one hundred feet wide from bank to bank at the points spanned by the railroad bridge, and carrying eleven months of the year something like 25 cubic feet of water per second. That is the Cache la Poudre. If the said observing passenger was informed that this modest little mountain stream was entitled to the credit for the existence of the thriving city of Greeley, with a population of 10,000 souls; of Eaton, 8 miles farther north, population, 3,000; Ault, 12 miles north, population, 2,000; Windsor, 12 miles west, population, 3,000; Fort Collins, 25 miles west, population, 10,000; and numerous little villages unnecessary to enumerate; that it furnished an abundant water supply for irrigation systems serving not less than 200,000 acres of highly improved farms worth easily on an average \$100 per acre, or \$20,000,000; that without it the magnificent sugar factories of Fort Collins, Windsor, Greeley and Eaton would never have been constructed; in short, that it supplies the water that makes possible the growing of crops annually that support a population of 50,000, the observing passenger would think it a Colorado yarn or a fairy tale from California.†

*Official Proceedings, Nineteenth National Irrigation Congress, pp. 239-244.

†Value of improved farms may easily be given as double that of 1911 and population figures may be increased 25 per cent to arrive at 1926 estimates.

Nevertheless the foregoing is an extremely conservative statement. For we can enlarge upon the theme and truthfully assert that the return water from the lands irrigated by this stream make certain the filling, during fall and winter months, of the numerous immense storage reservoirs of the lower Platte country, east of Greeley to the state line, that in turn serve great areas of fertile land. Because prior to 1890 the surplus water of the Poudre, during May, June and July, the period of floods, rushed angrily down its channel to the Platte, frequently washing away bridges, head-gates and dams, flooding the lowlands, and doing great damage, and passing out of the state, augmented the flood waters of the Platte, doing incredible damage to railroads and other property in Nebraska. All of these floods, except in abnormal years, are now turned into the numerous reservoirs of the Cache la Poudre valley held in leash, as it were, until "the bottom drops out of the river" as irrigators put it, and then drawn upon to mature the great Greeley district potato crop, that is watered ordinarily, for the first time the latter part of July, and which is made almost entirely from stored water; the third crop of alfalfa and sometimes the second crop; and in the main the great sugar beet crop, often requiring water as late as the first week in September, when the channels of the streams are dry.

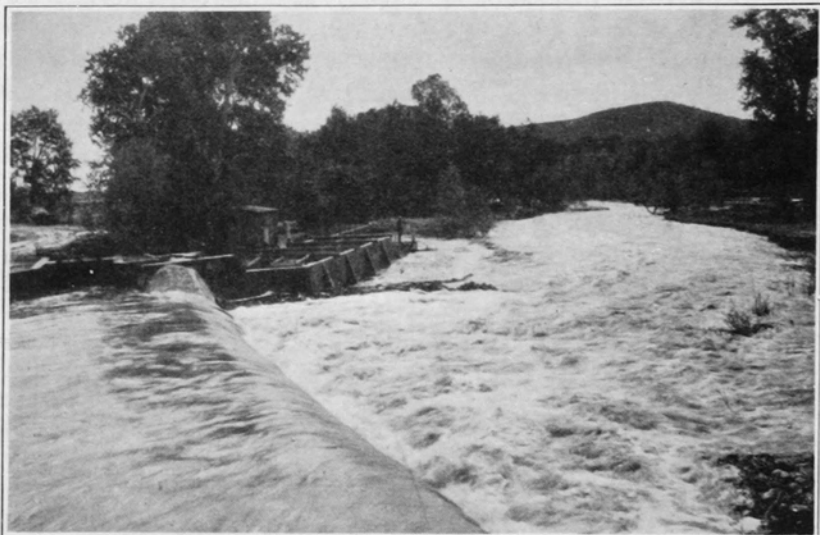
TERRY LAKE WAS FIRST.—Then followed a brief statement telling of the construction of the Union Colony canals, including the Farmer's Ditch in 1871: "Reaching out onto the upper branches or mesa on the north side of the river," which was at that time the most extensive "high line" canal in Colorado, "built to irrigate land above the river bottom." Then in 1890 the first plains reservoir of any size to be filled from the Cache la Poudre was constructed, this being Terry Lake*—

* * * built by the farmers of the Larimer and Weld canal, then and now the largest and longest canal in northern Colorado, 60 miles in length and with a present capacity of 1,000 second feet and serving some 60,000 acres built by former Governor Eaton, with a decree dated January, 1879. I was a farmer under this ditch, and with others suffered from an insufficient water supply. We looked with jealous eyes on the profitable crops of potatoes grown by our brother farmers under old Greeley Colony ditch No. 2, with a decree dated 1871, calling for practically all the water in the Poudre after July 1st. We could not raise potatoes. And we had frequently to irrigate our grain crop when it was too early—when it baked the ground, turned the grain yellow, and cut the yield down one-third—for fear we would make no crop at all for lack of water later on. About one crop of alfalfa—the first—and a half crop the second cut, stuff that resembled an imitation of an alfalfa crop I have sometimes seen growing in the dry belt in eastern Colorado and western Kansas, and some brown fuzzy stuff in place of a third cutting. That was our condition under the Eaton ditch and other late ditches prior to the advent of Terry Lake, the pioneer reservoir of the Poudre valley. Many difficulties attended the building of this reservoir, unnecessary to fully describe herein. * * * but we persevered and after one run of water the clouds vanished, and farm lands under the Eaton ditch suddenly doubled in value. For thereafter we raised bumper crops of potatoes and everything else grown under any old ditch.

POUDRE BASIN STORAGE.—Clark then gave a list of reservoirs storing water of the Cache la Poudre, there being fifteen at that time (1911), with a total capacity in cubic feet of over three billion; 3,012,000,000 is the figure in detail of cubic feet, or 69,025 expressed in acre-feet. Since that

*The first preliminary survey of Terry Lake was made in 1877, or 1878, by R. Q. Tenney of Fort Collins, according to Biographical Sketch of Tenney, written by Ansel Watrous. The same authority cites the fact that Tenney with Wallis Link and others, went over the Laramie-Poudre tunnel project in 1904. This project was conceived by Wallis Link, who in 1901, discovered a chain of lakes on the east slope of the Medicine Bow Mountains, the lakes now bearing his name. These lakes are a part of the system, the idea for which, including the two-mile tunnel, was conceived by Link, who interested capital in the project, which now waters 50,000 acres in Weld county.

time this has been more than doubled. In 1922 the total capacity of the reservoirs in the valley of the Poudre was 150,000 acre-feet; Windsor reservoir, then the largest, was rated at 17,000 to 18,000 acre-feet. In 1924 and '25 extensive enlargements were made at Chambers Lake, Black Hollow and other reservoirs, providing additional storage capacity. These increases were the direct result of an abnormally dry winter and spring of 1924-25 on the Poudre and other eastern slope watersheds. The rainfall at Fort Collins for 1925 was 14.50, but the rains came late. Light snowfall



Diversion dam of the Jackson ditch on the Cache-la-Poudre at Bellvue.

in winter and spring with consequent low water in streams, caused a big draft on the reservoirs at a season when the ditches and rains should have started crops and kept them growing. The lesson of that drouth was, more storage. Enlargements were under way in 1926 to meet any possible emergency in years to come.

While storage on the Cache la Poudre has reached nearer the maximum capacity of the stream than elsewhere, this description of storage applies, in a measure, also to other eastern slope watersheds.

METHOD OF WATER EXCHANGE

Another feature of development in which the irrigation systems of the Cache la Poudre Valley pioneered is that of water exchange. This was originated by the Water Supply and Storage Company, and it was found so beneficial and so equitable that the legislature in 1897 incorporated it in the irrigation law of Colorado. Section 4 of the act reads as follows:

When the rights of others are not injured thereby, it shall be lawful for the owner of a reservoir to deliver stored water into a ditch entitled to water, or into a public stream to supply appropriations from said stream, and take in exchange therefor, from the public stream higher up an equal amount of water, less a reasonable amount for loss if any there be, to be determined by the state engineer; provided, that the person or company desiring such exchange shall be required to construct and maintain under the direction of the state engineer, measuring flumes or weirs and self-registering devices at the point where the water is turned into the stream or ditch taking the same, or as near such point as is practicable, so that the water commissioner may readily determine and secure the just and equitable exchange of water as herein provided.

BENEFITS OF WATER EXCHANGE.—In order to utilize sites which could be developed cheaply and at the same time to save the cost of intake canals, twelve reservoirs of the Cache la Poudre Valley, with an aggregate capacity of about 50,000 acre-feet, were built below the distributing canal of the companies owning them. The problem of making the water stored in these reservoirs available for use in the distributing canals above has been solved by the development of this system of exchange of water. In 1916, an average year, the operation of the exchange system made available for use on higher land about 55,000 acre-feet of water stored in low reservoirs, or 14 per cent of the total supply used by all the canals of the valley.*

SALE AND RENTAL OF WATER

Bulletin 1026 of the United States Department of Agriculture contains a description of the manner in which reservoir water is sold or rental rights given for a season. "Many reservoirs are owned by individuals and were built expressly for the purpose of selling the water stored in them, while others are owned by co-operative companies which impose no restrictions as to where the water may be used. Many farmers own an excess of rights in these reservoirs, and others have an excess when their scheme of rotation of crops brings them around to a year in which they have a preponderance of crops requiring only early irrigation. To offset this supply there is always more or less demand from farmers who have not quite enough water for ordinary conditions and who suffer from a real shortage in dry weather, or from farmers who have a sufficient supply in average years but who are growing a large acreage of crops requiring heavy late irrigation.

"In ordinary years under the Greeley Canal No. 2, a second-foot for twenty-four hours will sell for \$5.00, and there will be an additional charge of \$1.00 for carriage in the canal, but in dry years the price may be as much as \$16 per second-foot per day. Rights in Terry Lake carrying between 45 and 50 acre-feet per season, have rented for from \$40 to \$300, but the average charge is close to \$75. North Poudre shares carrying $1\frac{1}{2}$ to $2\frac{1}{2}$ acre-feet average about \$10 per season. It is natural that under

*Bulletin 1026, "Irrigation in Northern Colorado," by Robert G. Hemphill, Irrigation Engineer. Contribution from the Bureau of Public Roads, United States Department of Agriculture, May 16, 1922.

these conditions there should be a certain amount of speculation. In the early spring the speculator buys water, or rents rights, to be held and later rented or sold to others. Whether he makes or loses depends chiefly on the dryness of the season. Water for which he paid \$2 an acre-foot may sell for \$8 or \$10, or there may be no market at all for it."*

ARTESIAN WATERS OF COLORADO

Development of artesian waters for irrigation has not been successful, though many flowing wells have been brought in, and well defined artesian basins have been discovered. Two basins have been particularly useful in furnishing water for domestic supply, these being the Denver Basin and the San Luis Valley. The earliest record of prospecting for artesian water is of 1871, when General William J. Palmer, in charge of construction of the Kansas Pacific Railway, drilled at Kit Carson, but did not strike an artesian flow. In 1881 and 1882 the Government made tests at Akron, Fort Lyon and Cheyenne Wells, striking a small flow at Fort Lyon only. The first considerable flow brought in by private drilling was at Pueblo, where the Pioneer Oil Company struck artesian water January 1, 1880.

DENVER BASIN DISCOVERED IN 1883.—The Denver Basin was discovered in 1883 by prospectors who were looking for coal in North Denver. This led to the sinking of scores of wells in and around the city, with good results, though most of these ceased to flow after a few years. A few of the deeper wells are still in use, supplying water for boilers and for drinking purposes in office buildings and hotels in Denver. These wells are now all on pumps. During the first few years wells in the Denver area were used for irrigating gardens and, in a few instances, for tracts of from one to ten acres. In late years, however, there were few remaining with sufficient flow for irrigation.

SAN LUIS BASIN.—The San Luis artesian basin is the most important in the state, having hundreds of flowing wells, used mostly for domestic supply and gardens, though there are a few which water small acreages of field crops.

Congress authorized prospecting for artesian waters on the western plains in April, 1890, in the hope that a supply might be found of sufficient volume for irrigation. Richard J. Hinton, special agent, was in charge of the survey, assisted by Robert Hay, chief geologist, and E. S. Nettleton, chief engineer. Prof. L. G. Carpenter, of the Agricultural College, was attached to the Government survey to collect information on Colorado's and New Mexico's artesian possibilities. The results are given in Executive Document No. 222, 51st Congress, First Session. That report

*Bulletin 1026, "Irrigation in Northern Colorado," U. S. Department of Agriculture.

confirmed investigations made independently in Colorado to the effect that artesian wells were not dependable for irrigation. However, they developed knowledge on underground waters which here and there are at shallow depth and in volume sufficient to make pumping for irrigation profitable for certain crops.

IRRIGATION BY PUMPING

Irrigation by pumping in Colorado dates back forty years, the first well of which there is any record being put down by E. F. Hurdle, in 1885, in Lone Tree Creek bottoms, east of Eaton. Hurdle not only put down the first well, but also two others at that time in the same neighborhood. Centrifugal pumps were installed which were operated by steam engines, as that was before the gasoline engine had been perfected. Coal was used for fuel, being hauled from a surface mine about a mile northeast of Eaton. Hurdle, who now (1926) lives at Guernsey, Wyoming, then was farming near Eaton, having, besides his own place, a leased farm, afterwards known as the Wilson farm. It was on the Wilson farm that the first well was dug.



Supplementary irrigation by pumping the underflow in a creek bottom in the dry land region. Illustration shows outlet pipe of pumping plant on Beaver Creek, ten miles south of Brush.

Hurdle knew that the Lone Tree bottom was underlaid with a deep strata of saturated gravel. After digging down to water, wooden frames were sunk into the gravel and worked down about ten feet, a total depth of twenty feet from the surface. This well furnished water for eighty acres of land. Hurdle sold his right in the first well with the lease on the land to Andrew Wilson, and on the south quarter of the same section put down a second well, this being on land which he owned. Henry Miller had the contract for digging the second well, and the cost of the work alone was \$800. An octagon crib was sunk into the gravel, which was worked down thirty feet from the surface and twenty feet into the gravel. After

installation of a pump it was found that 100 acres could be watered from this well.

WELL ON THE EATON FARM.—The third well was put down on the B. H. Eaton farm under Hurdle's supervision and with Henry Miller's help. Ex-Governor Eaton paid for the well, though Hurdle was renting and operating the farm at the time. This well did not have as strong a flow as the second. It furnished ample water for the grain, but was always short late in the season.

These first wells stimulated development, and in time there were about fifty good wells in operation. They are still supplying water, some of them being the sole reliance for irrigation of eighty-acre farms, while others furnish a supply supplementary to the ditch water. Ninety per cent of these wells now are operated with electrically driven pumps, the balance being run by gasoline engines. Hurdle left the state some years ago, moving to Wyoming, where he continued installing lifting devices, including water wheels and pumps, but for lifting water from streams instead of pumping the underflow.

There are other districts in Colorado where pumping is practised, but none that have such a long record of successful operation and flow as that along Lone Tree Creek, east of Eaton.

COLORADO'S RANK IN IRRIGATION

In 1889, when the United States Census Bureau made its first detailed report on irrigation enterprises, Colorado ranked second among the states in irrigation development, with 890,775 acres of land under ditch. California was first at that time with 1,004,223 acres irrigated. Colorado took first place in the area of land irrigated in 1899 and held that rank until 1919, when California went ahead of it as a result of the development of water from the drilling of wells. Colorado continues, however, to rank first among all the states in the area of land irrigated from the water supply of streams.

For the purpose of administering the waters the state is divided into six divisions, each in charge of a division engineer; the divisions in turn are divided into districts, of which there are 69 in the state, each in charge of a water commissioner. The state engineer, who has supervision over all, is appointed by the governor, subject to Civil Service regulations. The division engineers are appointed by the governor with the approval of the senate; and the water commissioners are appointed by the governor upon recommendation of the county commissioners of the counties included in each district, all subject to Civil Service regulations.

A YEAR BOOK ESTIMATE.—According to the Colorado Year Book, the amount of land now under ditch in the state is 4,700,000 acres; amount



Typical irrigation of growing sugar beet crop.

actually irrigated, 3,400,000 acres; amount possible of ultimate reclamation through all available water supplies, approximately 5,250,000 acres.

From the same authority: The total quantity of water diverted from natural streams for irrigation purposes, 7,475,000 acre-feet. Average quantity diverted for storage reservoirs, 1,800,000 acre-feet. Apparent gross duty of water, about 2.20 acre-feet per acre of land irrigated. Length of all main canals and laterals approximately 28,000 miles. Number of storage reservoirs and dams, about 1,000. Capacity of storage reservoirs, 2,400,000 acre-feet. Number of decreed water rights administered through state engineer's office, 17,100.

LARGE SUM INVESTED IN IRRIGATION.—The United States Census Reports show that a total of \$88,302,442 had been invested in irrigation enterprises in the state up to 1920. Of that amount 0.3 per cent had been invested prior to 1860. The period between 1860 and 1869 was particularly active, the investment reaching \$14,410,037, or 16.3 per cent of the total. The largest for any decade, however, was between 1880 and 1889, when \$17,150,419 was invested, or 19.4 per cent of the total up to 1920. There was considerable work done in the ten years preceding the World War, but from 1915 to 1919 the investment dropped to \$550,890, or 0.6 per cent—the lowest since 1860. Construction was actively resumed in 1924.

WHAT OF THE FUTURE?

What may be expected in irrigation is pointed out in the following statement by Prof. E. B. House, head of the Department of Civil and Irrigation Engineering, Colorado Agricultural College:

“As to the future of irrigation in Colorado, our possibilities are certainly not unlimited. This especially is true of the eastern slope. Our water supply is limited and at the present time is very much over-appropriated. In the developments of the future a larger acreage will be served with the same amount of water that we are using now. When this is accomplished our distribution will be more efficient and our farmers will be required to submit more willingly to dictation by those in authority. Our present system of delivery of a continuous flow throughout the irrigating season to each farmer under the ditch, giving him his share of the water, will have to be discontinued. He will have to pay for the amount of water he uses. He will then use considerably less than he does now.

CANALS WILL BE LINED.—“Our irrigation canals will be lined with concrete or some other impervious lining, and this will prevent a large amount of the seepage that now wastes so much of our water. Of course, this lining will be expensive, and will come gradually, and the canals will first be lined only in places where excessive seepage takes place. Some of our canals at the present time lose from 60 to 75 per cent of the water that

is turned into their headgates and very few of them lose less than 25 per cent. This is all seepage loss, and, although some of it gets back into the river, and is used again by the lower ditches, yet considerable of it is lost and a good deal of damage is done. This damage is shown in the seeped areas lying below every canal. I do not wish to venture a guess as to how great this development can be. I remember when a boy in Greeley that the water of the Cache la Poudre River was then 'all used' and yet today we are irrigating at least five times the area with the same water. I do not think it would be a wild statement to say that we can pretty nearly double the acreage we are now irrigating when things are worked so that we will have the maximum efficiency. The length that we can go in bringing this about is, of course, regulated by the cost of the necessary improvements and supervision and the value of our irrigation water."

WHO WERE THE FIRST IRRIGATORS?

It has become customary in teaching irrigation practice, as well as the history of its development in Western America, to start with the arrival of the Mormons in the Salt Lake Valley in 1847 and use that date as the beginning of irrigation by white American farmers. Reference has been made on previous pages of this chapter to these Mormon claims and to the statement honoring Brigham Young as the "founder of modern irrigation in America." Brigham Young was a remarkable religious and temporal leader, but there is nothing in his career on which to base the assertion that he made any discovery regarding irrigation, or otherwise did anything fundamental in that line. As a matter of fact, the exploits for which he is chiefly noted in western history were clearly outside the realm of agriculture.

Mormon writers and teachers have not been alone in attributing more to the influence of their pioneers than is their just due. Others have taken up the thread in 1847 and written from there forward. One of a number of such authorities may be cited here, this being William E. Smythe, author of "Conquest of Arid America," who, in speaking of the settlement of the Mormons in the Salt Lake Valley, says: "It was this emergency which produced the first irrigation canal ever built by white men in the United States."*

In another chapter of the same volume, Smythe writes: "Utah's pre-eminence in the land of irrigation is due to historical considerations rather than to the excellence of its canal systems, or to the superiority of its laws and customs. In the latter respect it is distinctly disappointing. The pioneers turned the water from the most convenient streams by the crudest devices and with no thought for any grand and enduring scheme of engineering."

*"Conquest of Arid America," Smythe, p. 55.

The Mormons began, as did other groups of pioneer settlers, under new conditions in the West, just as Smythe says. However, on the point of "historical considerations" there is much evidence to prove that they were not the first white Americans to farm by irrigation in the West and also to show that the white people of Spanish origin had developed community enterprises of considerable extent within what are now the boundaries of the United States.

CALIFORNIA BEGINNINGS.—Agriculture by irrigation in California was continuous from about 1830, when the Missions began to decline, to 1848, when gold was discovered, and thenceforward. It was carried on by American settlers from the eastern United States as well as by settlers of Spanish descent; irrigation was considered unnecessary in the central valleys for



Concrete approach to the Happy Canon flume, Montrose and Delta canal, on the Uncompahgre Project

small grains, but essential for corn, potatoes, garden crops, fruits and vines; crop production and range livestock production were advancing as industries after the decline of the Missions, and there was a constantly growing population of American settlers, not only in the central valleys, but also in southern California prior to 1847, the year in which the Mormons began farming by irrigation in Utah.

However backward general farming practices of the Hispano-American population might have been, in irrigation these people were experienced through centuries of practice, and it was from their example that the emi-

grants overflowing from the Oregon movement, or coming with California as their objective, learned the use of water on crops. Water was ever the first thought of the Spanish colonists in all arid America; water for domestic uses and for food production.

BRYANT DESCRIBES IT.—Edwin Bryant, who took part in quelling the uprising of the Californians (Spanish-Americans) in 1846, and was for a brief period alcalde or chief magistrate of San Francisco, is the author of a travel book that portrays California's agriculture faithfully. Bryant supplies, as an eye witness of the period, some of the detail that H. H. Bancroft, the historian, omits, or gives us only in general terms. Bryant was a diarist and chronicler. The title of his volume is "What I Saw in California," and the date of publication of the first edition is 1848.*

Bryant came from Louisville, Kentucky, to Independence, Missouri, leaving that outfitting point by mule packtrain May 1, 1846, proceeding over the Oregon Trail a year previous to the Mormon pilgrimage. He saw Great Salt Lake and passed around that body of water by a little used route, leaving the beaten track but making his way through to California with a small number of companions.

He arrived in that state just before the insurrection. Before Bryant joined the American troops and, afterwards, while on the march with them, as well as during his short official term as alcalde of San Francisco under General Kearney, he observed the agricultural and industrial development of the newly acquired territory. Bryant does not end with his own observations, but is careful to inform his readers of what has gone before. He removes all doubt as to the importance of the Missions as factors in developing agriculture and stock raising.

SOME MISSION HISTORY.—He includes in his volume a translation from the Spanish of a history of the Missions, which need be only briefly referred to here. This history was written in 1822, at which time there were 21 Missions, the first to be built being San Diego, 1769, the last San Francisco Dolores, the most northern, 1822. These Missions consisted of extensive habitations, storehouses, granaries and buildings for soapmakers, weavers, and blacksmiths; pens for horses and cattle, apartments for Indian pupils and servants, and, of course, the church, which was always the most imposing structure of the group. Nearby were quarters for a small garrison on guard duty. The general activities of the Missions included, according to this translation, the breeding of a larger class of cattle, sheep and horses, the raising of wheat, maize (Indian corn), beans, peas, and other vegetables; and at the southern Missions, "grapes and olives in abundance."

*"What I Saw in California," being the journal of a tour in the years 1846-47, by Edwin Bryant, late Alcalde of San Francisco, by D. Appleton & Co., New York, 1848.

AN EXTENSIVE COMMERCE.—There was an extensive commerce in hides and tallow and some trade in flax, linen, wine and olive oil, through various coast ports, frequented by merchant vessels sailing under American and other flags. Pueblos (towns) were established nearby but were not a part of, nor were they under the jurisdiction of the friars, but were directly responsible to the civil government of Mexico.

For detailed historical account of the Missions and their secularization and decline no authority is more reliable than Bancroft.*

When Bryant traveled in California in 1846 the Mission buildings were going to ruin, but the orchards, vineyards and gardens were still bringing forth fruit under irrigation. The extent of agriculture by those who succeeded the friars on Mission lands and by others who obtained grants independently from the Mexican government, is the point at issue.

MEXICAN COLONIZATION POLICY.—It should be said here that the Mexican government had a well-defined colonization policy—which is more than can be said of our own government in its pioneer period. As early as 1828, regulations were promulgated on the subject of land settlement by the Mexican government.

LAND CLASSIFICATION IN 1828.—These regulations applied to grants made to colonists and fixed a maximum to any individual grantee of one square league of irrigable land, four square leagues of temporal land (such being the term used applying to land farmed under the seasonal rainfall) and six square leagues of grazing land—eleven square leagues (about 50,000 acres) in all.

Here is evidence of an advanced policy with reference to development of arid land that needs no comment; and it is proof also of knowledge of what constitutes a fair proportion of the various classes of land in a country where irrigation is practiced.

AMERICANS USED IRRIGATION.—As to Americans on California land in the days before the Mormon pilgrimage, Bryant visited several in the San Joaquin Valley and elsewhere. There was the ranch of Robert Livermore, who, in 1846, had been a resident of California "nearly 30 years." Of this ranch Bryant writes: "An arroya or small rivulet fed by springs runs through his rancho in such a course that if expedient he could, without much expense, irrigate one or two thousand acres. Irrigation in this part of California, however, seems to be entirely unnecessary for the production of wheat or any of the small grains. To produce maize, potatoes and garden vegetables, irrigation is indispensable."

There was also the ranch of Dr. Marsh, a graduate of Harvard University, who, according to Bryant, had been in California seven or eight

*"History of California," H. H. Bancroft, Vols. XIX and XX.

years. He had two thousand head of cattle and had a vegetable garden and a vineyard. He explained to Bryant that grape-growing had been introduced by the friars. No specific mention of irrigation is made in describing Dr. Marsh's ranch.

MADE WINE AND BRANDY.—Then there was the vineyard of Mr. Wolf-skill of Los Angeles, the owner being referred to by Bryant as "an American gentleman." He had four or five thousand vines and in the previous year he had made 180 casks of wine and about the same number of casks of aguardiente—a grape brandy; also some peach brandy. "Tropical fruit trees border the walks of his garden," says Bryant. "The quantity of wine and aguardiente produced in California, I would suppose, amounted to one hundred thousand casks of 16 gallons, or 1,600,000 gallons. This quantity, by culture, can be increased indefinitely."

Many large vineyards in modern days, on sandy soil in Southern California, produce without irrigation, but on other soil types the vines are watered, as are, of course, fruit trees and field crops in that semi-arid region.

As is the case with other travelers, Bryant takes irrigation for granted and he does not discuss it as something new or unheard of. Furthermore, he says:

"Subsequent to the expulsion of the Mexicans, numbers of new farms were erected and hundreds of Americans were scattered over the country. Previous to 1839, the actual possession of horned cattle by the ranchos did not exceed 100,000; but in 1842, according to a fair estimate made by one on the spot, the number had increased to 400,000; so that the aggregate is equal to that held by the Missions when in their most flourishing condition. The present number is not much, if any, short of one million."

His attempt here is to show that decline of the Missions was followed by agricultural progress, which was natural, for Americans had come in numbers sufficient to change the spirit of "manana" that ever characterized Spanish civilization.

ESTIMATES AMERICAN POPULATION.—He makes estimates, perhaps little better than guesses, on the population. There had been no official enumeration except in the past, on the Missions. "The permanent population," writes Bryant, "of that portion of upper California situated between the Sierra Nevada and the Pacific I estimate at 25,000. Of this number 8,000 are Hispano-Americans, 5,000 foreigners, chiefly from the United States, and 12,000 christianized Indians."

There had been no gold discovered then and there was no mining boom in northern California. Of agriculture Bryant wrote specifically referring to the Spanish people, or Californians, as they were called: "Agriculture is

in its rudest state. The farming implements which have been used by the Californians, with few exceptions, are the same as were used three hundred years ago, when Mexico was conquered by Cortez. * * * The Americans are, however, introducing the American plow and other farming tools, the consequence of which has already been, to some extent, to produce a revolution in agriculture."

That was as true of New Mexico as of California. The friars were good spiritual guides; they knew agriculture and could have taught it as well, perhaps, as their religion, but true to the traditions of the hierarchy they represented, they went only so far as to assure their own and the sustenance of their convert Indians. They built safely on irrigation, but they did not progress in methods of sowing and reaping their crops.

They did leave for their successors in California the beginnings of a horticulture that, under American enterprise, has reached proportions hitherto unsurpassed in any country of the world. Bryant and other early observers prior to and during the gold rush, enjoyed, literally, the fruits of the labor of the friars, picking them from the thrifty trees at the Missions, where someone kept the water flowing, tending the gardens, vineyards and orchards that were showing a new California the way of conquest of arid agriculture.

BAYARD TAYLOR'S TESTIMONY.—In 1849 Bayard Taylor,* famous as a writer of travel books, visited California and described not only the scenes of excitement in the gold camps, but the more peaceful agriculture, in ample detail. Of the old irrigated orchard of the Mission of San Jose he writes: "Hundreds of pear and apple trees stood almost breaking with their harvest, which lay rotting by cartloads on the ground. Plums, grapes, figs and other fruits, not yet ripened, filled the garden."

He describes the ranch of Captain Fischer, "who is married to a Californian lady," and goes on to say "has lived many years in the country has one of the finest ranches in the valley, containing four square leagues of land or about 18,000 acres. There are upon it eighteen streams or springs, two small orchards, and a vineyard and garden."

Taylor mentions crops that are grown without irrigation and those that require it, emphasizing the fact that in the particular locality of which he is writing, corn is grown without irrigation and even grape vines "when planted on moist slopes," produce without irrigation. Like Bryant, he accepts as commonplace the use of water on crops and emphasizes rather the localities or situations where some crops do not require artificial watering. That irrigation was an old practice and that it was a common practice is evident from Taylor's accurate descriptions of 1849. As did Bryant,

*Bayard Taylor's Travels: Eldorado, G. P. Putnam's Sons, New York, 1894.

so Taylor made some investigation of Mission agriculture. Taylor's estimate is that the original Mission lands comprised about 8,000,000 acres. Three million acres of this vast domain came into possession of the United States as public land. Much of this, according to Taylor, "has been cultivated, or is capable of immediate adaptation for the planting of orchards, gardens and vineyards * * *"

In 1849 Bayard Taylor wrote this: "The best agricultural districts—those of Napa, San Jose and Los Angeles—are already settled and cultivated, but the upper portion of the Sacramento country, the valleys of the Trinity River and the Russian River and the lower slopes of the Sierra Nevada embrace a great deal of arable land of excellent quality."

The Mormon pioneers had no knowledge of this development in California, except such as might have been brought them by their own converts coming into Utah from the Pacific side, or what might have been learned from the expedition which Brigham Young sent to California for food and livestock, or from the pack mule trains that brought food from the irrigated farms of California.*

EVIDENCE FROM TEXAS

Now for a brief consideration of early irrigation in Texas. How the Spanish crown directed, supervised and chartered companies for irrigation in the colonies and how irrigation was developed in Texas along the San Antonio River, is related in Chapter XV of "San Antonio de Bexar," by Mrs. S. J. Wright.† There was irrigation on an extensive scale, first by the friars, then by Spanish colonists, later by Americans. Quoting from the chapter entitled "The San Antonio River—Its Acequias and Legends":

When the early Spanish Missionaries traveling over the parched Western plains, came suddenly upon the San Antonio Valley, how their hearts must have throbbed with surprise and delight at sight of the gushing springs, the beautiful, clear, strong-flowing river and the goodly lands on either side.

The first irrigation ditches, acequias, in Bexar and its vicinity were built by these unselfish and practical padres. To their correct estimate of the value of this water and their appreciation of the facilities for its distribution, San Antonio de Bexar owes its existence today. A knowledge of the building of the acequias—monuments to a simple wisdom and an unflinching industry—means an insight into the early history of San Antonio. Following the mission era and during the colonization period, the sale of lands in Texas was but a suggestion made to the ruling powers by the successful operation of the system by the United States of the North, but even then lands incapable of irrigation were deemed of no value except for pasturage.

*The arrival in November of the first pack mule train from California, laden with many luxuries and necessities, was an important event. The people formed a line, waiting hours for their turn to buy the limited amount allowed. When a sack of potatoes was brought into the valley in the spring, they were eagerly bought at any price.—H. H. Bancroft's *History of Utah*, p. 297. (It was in 1849 that California supplied the Mormons of Salt Lake City with potatoes.)

†From "San Antonio de Bexar," by Mrs. S. J. Wright, past-president Texas Federation of Women's Clubs, Chairman History Committee, Texas Federation Women's Clubs. Morgan Printing Co., Austin, Texas, 1916.

The Council of the Indies (The code and records of this Council were known as the "Recapitulation of the Indies") sitting in Seville, its members appointed by the Crown to direct and control the Spanish colonies all over the world, devised exhaustive regulations and laws relative to acequias, the San Antonio River from source to mouth, being a possession of the King.

FRIARS LAID THE FOUNDATION.—In California, then, the Franciscan friars were the first irrigators of the white race. Their development laid the foundation for the American settlers of Anglo-Saxon stock, who came shortly upon the secularization of the Missions, and continued agriculture with irrigation, as well as without, leading up to the gold discoveries in 1848 and the great rush of the Forty-niners. But for this preparation, there would have been no food to sustain the miners. This rush was a fortunate turn of events also for the Mormons of Utah, for great caravans came through the valley of Salt Lake early in the fifties on the way toward the setting sun. They bought the grain, potatoes and other products which were then being grown in excess of home needs.

In Texas and New Mexico, also, the Spanish introduced irrigation methods and practices from Europe. The original colonists from Spain were aggressive. They built permanent communities along the Rio Grande and other streams on the northern outposts of a civilization that extended through Mexico and over a great portion of South America. They sent back to the mother country maize, potatoes, tobacco, sunflowers and other plants for use of man, these having been developed by the aboriginal inhabitants of the western world, who had been irrigators for centuries untold.

UNDER THE HIERARCHY.—It is interesting to note that Mission agriculture in California and other southwestern states was under a hierarchy, as was that of Utah. Under the Spanish system the church retained control of most of the land and development ceased when the church withdrew from a region. In Utah there was church direction, but property was owned by the individual, who thus had an incentive for development. Under the Catholic regime, after the first flush of Spanish conquest, there was no temporal progress; agriculture remained practically stationary and there was retrogression among the people, who mixed with their native neighbors after they ceased to fight them. In Utah the community spirit was manifest and all worked for the common good, because each landholder benefited by the fruits of his industry. Under that system there was remarkable progress in agriculture, even though it be stripped of some of the glamour in which writers of recent days have tried to envelop it. Utah people were not the first white Americans to farm by irrigation in the West, but their development was of greater significance as time went on, because it was on a larger scale than that of the early California farmers. However, that did not happen in a year and it was not the founding of a new system, nor the first community irrigation in arid America.

BACK TO THE ANCIENTS.—Agriculture is not a matter of race or nationality. No one knows how long the western continents have been inhabited and agriculture is just as old as humanity, while irrigation is at least as old as the record of human history. There is a life-time study in the laws and customs pertaining to irrigation, in which one may start with our own day, thence going back to Spanish, and from there successively to Moorish law, the Roman law, the Mosaic law and finally to the code of Kham-murabi of the Babylonian era, from which we take this classic reference:

“If anyone opens his irrigation canals to let in water, but is careless and the water floods the field of his neighbor, he shall measure out grain to the latter in proportion to the yield of the neighboring field.”*

That regulation was carved in stone 2,300 years before the Christian era. Thus may the student go back to the ancients for knowledge as to what people were the first irrigators.

*History of Mesopotamia, “The Historians History of the World,” Vol 1, p. 498.

CHAPTER VII

Dry Land Farming Completes Conquest of Plains

DRY LANDER'S LOT THE HARDEST

While every line of agriculture followed under the varying conditions of climate and altitude in Colorado has its difficulties, none has so taxed the ingenuity and endurance of man as that given the name of "dry land farming." Just what is meant by this term is best given in the definition of Professor Alvin Kezer, agronomist of the Colorado State Experiment Station, in these words:

"The commonly accepted definition of dry farming is taken to be the farming processes necessary for the production of crops without irrigation, in a region of deficient rainfall, usually below twenty inches per annum. It is granted that, under some conditions, dry farming methods must be practiced in order to farm successfully in some regions where the rainfall is higher than twenty inches per annum. Then, too, there are conditions of precipitation, coupled with favorable soils, where crops may be successfully grown with total precipitations as low as nine inches, or even a trifle less. Summer fallow is often practiced where farming is in vogue under such light rainfall conditions."

During the early days of settlement it was generally accepted that agriculture without irrigation was not feasible in Colorado, except only along streams where certain crops might yield fair returns in seasons of normal rainfall. These misconceptions, due to a climate that was not understood, are dwelt on at some length in the chapter devoted to irrigation and that on the livestock range industry, the latter having a significant bearing on dry farming, because of the desire on the part of cattle and sheep growers to retain the grass for their flocks and herds. While settlement of the unirrigated plains region was therefore held back as long as the range men were in control, steady inroads were being made on their domain by homesteaders who were land-hungry and determined to face discouragement and disaster, if need be, to show that a living could be wrested from the soil of the prairies, without the use of water for irrigation. The faith of these early



Where the State Agricultural College Proves Dry Land Farming. General view of the Cheyenne Wells Dry Land Demonstration and Experimental Farm. No water used for irrigation.

settlers has been justified, though at a price which seemed at times almost too high to pay for a quarter or half section of land.

While farmers on irrigated land were new to that type of agriculture, they did have assurance of success, based on centuries of experience in other lands, and they could see for themselves from the very start of crop growing that water meant everything, and that irrigation farming brought yields beyond the dreams of men who had been accustomed to the less spectacular work of unassisted nature in the sub-humid climate of the Mississippi and Ohio valleys.

Not so with the "dry lander." He had no guide, no body of literature to fall back on, save the extravagant claims of colonization company circulars; no offer of aid from a paternal government. The government encouraged him to pick out a homestead, but told him to fight it out with the Creator if the rainfall was short, as the government could not be responsible. Not only was the dry lander without friendly aid, but he had to face the bitter antagonism of the cattle and sheep raiser in possession of areas which, while in reality public land, were nevertheless furnishing private pasture for livestock, by reason of the ranger's control of the streams.

FIRST GENERAL MOVEMENT.—The first general movement of settlers into eastern Colorado started with the completion of the Kansas Pacific and the Atchison, Topeka & Santa Fe railways. This was during the early seventies, and it was more or less of an overflow from Kansas. It left little impression on the prairies where buffalo still were common and Texas Longhorns had just begun to graze. At that time, however, there were settlers who had already discovered the adaptability of the country to wheat growing, and some range men were even then growing corn or other forage for their stock in favored spots, with no moisture except that provided by nature.

FIRST DRY LAND TESTS.—The first experiments in crop production under the prevailing semi-arid conditions were made under the direction of R. S. Elliott, industrial agent for the Kansas Pacific Railway. These tests were made from 1870 to 1873, in western Kansas. Results were applicable as well to eastern Colorado. Elliott, writing of his own work in the *St. Louis Globe-Democrat*, said: "I found that good, merchantable winter wheat could be grown without irrigation half way from Kansas City to Denver, but I did not set out to establish that the country west of Fort Harker, or say $98\frac{1}{2}$ degrees of longitude from Greenwich, was a region of general agriculture. I only assumed that stock growers could, by breaking up the soil, grow fodder and grains for themselves and their domestic animals, and trees, shrubs, etc., to beautify and protect their houses and supply

fuel. This I established for a large section of country and the settlers are proving it."

A GEOGRAPHIC BLUNDER.—The blunder of early geographers in designating the vast Great Plains region as "the Great American Desert" was a stubborn obstacle in the way of immigration. The railroads were extended west of the Missouri River only in the hope of aiding in the settlement of the country and thus assuring themselves a profitable carrying trade. Neither the mines of Colorado nor the livestock business, which was largely handled by trail drovers, offered sufficient revenue to maintain the railroads. The limited areas of irrigable land were being taken up and there remained nothing for development except the pasture lands of the plains and the mountain valleys. The Santa Fe was looking to Europe for settlers, and that line did succeed in bringing thousands of families from Germany and Russia to Kansas. Efforts of the Kansas Pacific to induce immigration were concentrated on eastern states and the large industrial centers. This initial tide was a mighty one, but it penetrated only slightly beyond the safe line of farming in central Kansas. The rest was still considered "the Great American Desert."

The early explorers who were responsible for this blot on the map of the West were honest in their opinions and justified in their conclusions, especially if they saw the country during a midsummer drouth, or late in fall and winter, when vegetation was dead and the lack of trees, shrubbery and living streams emphasized the barrenness of the region, as compared with the looks of the country from which these travelers had come. They had seen nothing like it and they took only visual evidence for their conclusions of its aridity.

POLITICAL CAPITAL MADE OF IT.—Political capital was made of the term "the Great American Desert," according to one trained observer who passed over the plains in 1871 and made a book of his visit. This writer was John H. Tice, and the title of his book was "Over the Plains and on the Mountains."*

Tice was a member of the Missouri State Board of Agriculture and one of a party to make a tour of the Kansas Pacific and other railroads in Kansas and Colorado during the summer of 1871. In making detailed account of the experiments with crops, trees and shrubbery conducted by R. S. Elliott of the Kansas Pacific, Tice relates that responsibility for perpetuating the designation "the Great American Desert" goes back to John C. Calhoun and the days of the struggle in Congress over the Missouri compromise, by which all that territory lying north of latitude 36 degrees, 30 minutes, and west of Missouri, was "dedicated forever to freedom."

*Over the Plains and on the Mountains, by John H. Tice, Western News Company, Chicago, 1872.

This was a big slice of the Louisiana Purchase. According to Tice's version of the compromise, Calhoun, then Secretary of War, placated Southern slavery sentiment with the reports of the explorers, to show that what had been bargained away to the anti-slavery people of the North was not worth fighting over.

"These documents described the country as worthless; merely a vast arid, treeless, rainless, sandy desert; no springs nor running brooks, because there was no rain to supply them; and so sandy that the streams that flowed from the mountains were soon absorbed on the plains," wrote Tice in referring to the Great American Desert. He went on to state that the settlement of Kansas up to Ellsworth, 225 miles west of Missouri, had dispelled this illusion "as far as the eastern half of the territory is concerned; but our geographers still represent the western half as the Great Desert, or The Desert, omitting the sandy shading."

DESCRIBES THE EXPERIMENTS.—Tice then went on to describe what he had seen at the three points on the Kansas Pacific, where these first dry land farming demonstrations were made.

Regarding Wilson's Creek, he said: "But Wilson's is on a high bench, with a different soil and with less black loam than the plains eastward. In fact, it is a different, a cretaceous formation, reaching clear to the mountains. Here, then, the test was to be made whether this formation was deficient in the elements of fertility, and if not, then, under proper conditions, the whole plain would be productive. Late in November, wheat, rye and barley were sown, and the season being unusually dry, the prospect of success was not considered to be very flattering. The area sown was about one acre and a half of each kind. When we were there (on the 9th of June), the whole crop would be ripe within ten days. The stand, the height and the general appearance of the crop were equal to the best crops under similar circumstances in Missouri and Illinois, and in the rich yellow coloring of the straw and freedom from disease, far superior. * * * As far as the experiments of the present and past season are concerned, they have been eminently successful."

TREES ALSO WERE PLANTED.—Trees also were planted and the report on these, written by Tice, was as follows. "The seedling oaks and walnuts looked thrifty and of their success there can be no doubt. Of evergreens there were planted the Scotch and the Austrian pine and the Norway spruce. * * * The success in tree raising is of the highest importance, since incontestable facts prove that of all the agencies within the control of man for the amelioration of climate that of covering the earth with forests is the most effective."

APPALLED AT THE OBSTACLES.—In spite of what he saw in western Kansas, Tice was appalled at the obstacles which had to be overcome in settling the plains east of the Platte. "The most serious," he said, "are the want of living streams for stock and irrigation in summer and the severity and long continuance of the winters. To remedy the first evil it is said that the Kansas Pacific Railroad Company, who own millions of acres on these plains, has in contemplation to carry the waters of the South Platte from the mouth of the canon where they debouch upon the plains, in a canal eastward to the head-springs of the Smoky Hill. This is entirely feasible, but whether it can be done compatible with the rights and interests of the settlers on the Platte below is a serious question."

HAYDEN REPORT GIVES DETAILS.—In the Hayden Geological Survey Report of 1871 appeared R. S. Elliott's statement concerning the tests reviewed by Tice. The farthest point west included in the tests was Pond Creek, now known as Wallace, only twenty miles from the eastern border of Colorado, and forty-two miles east of the Cheyenne Wells dry land demonstration farm. Elliott's conclusions regarding the production of forage crops were amply justified by later experience in the development of farming on the plains with rainfall as the only source of moisture. Quotations from the Elliott statement follow:

Twenty years ago the lands available for general agriculture west of the State of Missouri were supposed to lie in a belt of not more than 100 miles in width, extending north and south. Even when the Territory of Kansas was organized, the whole area west of Missouri and east of the mountains was of doubtful value in public estimation; and emigration was stimulated by political considerations rather than by correct knowledge or appreciation of the country. Beyond the narrow belt and stretching away to the mountains, was the unfruitful waste, as popularly estimated. Its possible future use for its actual occupancy, if ever to arrive, was regarded as far distant. The settlers, however, soon ventured beyond the supposed boundary of productiveness; and as they increased in numbers, the area of available lands was found to extend itself westward, as if to meet their necessities. The construction of the railway brought increased emigration, more accurate knowledge of the resources of the country, and a firmer confidence in its future. By 1870, settlements had stretched along the railway to points more than two hundred miles west from the State of Missouri. The pioneer had passed the boundary of the traditional desert at the ninety-seventh meridian, and in his march westward had found that the desert, like its own mirage, receded before him. Was his march to continue; and how much further could soil, temperature and rainfall be relied on to reward cultivation? These questions, important to the interests of the general public, as well as of the railway, could best be answered by experiments, and the directors of the company ordered some such experiments to be made.

In the spring of 1870, gardens were made at some of the stations at distances between two hundred and thirty-nine and three hundred and seventy-six miles west of Kansas City; the farthest westward being at Carlyle station, 2,948 feet above the level of the sea. Seeds tried in these gardens germinated well, and the plants with rude and imperfect culture, grew encouragingly. The results were satisfactory, although the destruction by insects was greatly beyond anticipation. Irish potatoes, for example, made vigorous growth, yet about the time of blooming were destroyed by a species of blister beetle (*Epicauta corvina*, Riley), which proved to be a more formidable enemy than even the Colorado potato bug. Spring wheat matured merchantable grain at Carlyle.

In the summer or fall of 1870 a few acres were broken at each of the three following stations on the Kansas Pacific Railway, distant from Kansas City and above the level of the sea, as follows:

Wilson, 239 miles west of Kansas City, 1,586 feet.

Ellis, 302 miles west of Kansas City, 2,019 feet.

Pond Creek, 422 miles west of Kansas City, 3,175 feet.

ALL IN BUFFALO RANGE—These places are in the western half of the State of Kansas. All are in the present buffalo range; all are in the region of short grasses; all are in the open treeless plains, beyond the limits heretofore assigned to settlements.

Wheat, rye and barley were sown at each of these stations in the fall of 1870; at Pond Creek, September 28; at Ellis, October 20; and at Wilson, November 11. At Pond Creek the rye grew finely and matured a fair crop; the wheat and barley were partially winter killed, but the surviving plants made heads of the usual length, well filled with grain of good size and quality. At Ellis the promise of all grains was excellent until the first of June, when a hail storm of unusual severity prostrated every stem. At Wilson the grains all did well. * * *

ALFALFA IS TESTED—Trials of grass seeds at the stations named have shown that sorghum, lucerne, timothy, clover and Hungarian grass may be regarded as future forage crops on the plains; the first and last being the most promising. Maize can be grown for fodder at each of the stations, and for its grain at Wilson and Ellis. At Pond Creek, sorghum made a good length of stalk and matured fine panicles of seed. At Ellis and Wilson, the stalks reached a height of nine to ten feet, and abundance of seeds were matured. This plant will be found to be of great value in western Kansas and eastern Colorado, if its usefulness for fodder has not been greatly overrated. In the dry atmosphere of the plains, the stalks could probably be dried so as to avoid the souring of the juice, on which, in Illinois, an objection has been raised to its use as a fodder plant. * * *

Tests were made also with tree seeds, with cuttings and with transplantings, many varieties being tried, the comment being:

"The experiments with tree seeds, though very limited, have sufficed to show that trees may be grown from seed without irrigation, to the west line of Kansas, and in all probability to the base of the mountains."

Similar conclusions were reached in tests with cuttings of cottonwood, Lombardy and white poplar and with willows; also the transplanted trees of various kinds made a satisfactory growth. Rev. E. Gale, one of the regents of Kansas State Agricultural College, examined the trees in August, 1870, and gave his conclusions as follows:

THE EVERGREENS LIVED.—"The evergreens have nearly all lived and have made a growth of from 4 to 8 inches. All have done well. There is certainly nothing in the appearance of these trees to discourage the planting of evergreens in Kansas." * * *

"The experiments were all without irrigation. Except to soak some of the seeds, or to puddle the roots of the trees as they were set out, not one drop of water was applied by human agency. The trees had not the benefit of care and good cultivation; they were not aided by mulching the ground; nor had they any shade or shelter from the winds. All the conditions of the experiments were such as the ordinary farmer may easily imitate.

"One object was to test the possibility of growing trees and other plants on the plains depending on the rainfall alone. It was deemed important to show that the settler in the open waste may adorn his home with trees; may grow fruits and timber; may raise grains and other vegetable food for his family and livestock without resort to expensive processes of artificial watering. So far as we may judge from a single season, the object has been accomplished and it is not doubted that future years will sustain the promise of the past season."

NO ADVICE FOR SETTLERS.—Had intending settlers been advised by any existing agency of exact conditions and of such experiments as these, and their results, much distress and actual suffering could have been avoided. The Agricultural Colleges were just getting started, experimental

work was unorganized and no method had yet been devised of reaching the rural people with practical information on the problems of farming under these new conditions. The railroads did not assume to give technical information, nor did they have, save in such exceptional instances as that of R. S. Elliott, men in their land settlement work possessed of foresight and judgment to guide and advise homesteaders. As for the national government, its homesteading policy is best expressed in the phrase, *caveat emptor*; let the buyer beware.

It was thought sufficient to allow

settlers to take up claims under the homestead law, relying on private locaters and on the statements of men who were in the business for the locating fees, for guiding future citizens in the selection of farms.



A Homesteader's Cabin.

COLORADO DID NOTHING.—As a State, Colorado did nothing to fill the lack in the settlement plans of the federal government, nor did any other western state feel in duty bound to guide settlement or offer any help, until the experimental and extension work of the Agricultural colleges and the United States Department of Agriculture finally got under way, years after the first tide of emigrants swept over the range country.

Exploitation of the settler was the order of the day, land sharks lied and defrauded the emigrant, unreasoning and imaginative optimists painted the prairie in alluring tints and no one felt responsible for his success, nor cared a whit what happened to him after the emigrant fare was paid and the new comer was dumped out upon the treeless, waterless land with a "there now, make a home for yourself."

THE OPTIMISTIC BOOMERS.—The fact that these optimistic boomers did not themselves know the requirements and limitations of agriculture under semi-arid conditions, did not deter them from making exaggerated statements; in fact, they salved their consciences—if they possessed any—with the thought that they believed their own statements to be true! Their belief was founded on blind faith; their faith on supposition, and supposition arose as ozone from the exquisitely colored priaries on a May morning after a spring rain had brought the bloom to myriads of wild flowers that specked the natural meadows with rare beauty.

One example of the ornate style of the boomer, taken from *The Elbert County Democrat* (long since out of business), in its issue of April 15, 1887, will suffice. Before quoting it must be noted that Elbert County then

extended to the Kansas line and that the article dealt with what later became Kit Carson County. The heading was: "Burlington; See How She Booms. Business of All Kinds Rushing In." Now for an extract from the article:

A GENTLE RAIN OF 6 INCHES!—"Elbert County is an extension of the beautiful lands of Western Kansas, and is productive beyond computation. Everyone says the soil is all right, and moisture will make it produce. The question of moisture is no longer a speculation, but it is an assured fact. Last season this section was blessed with an abundance of rain and the rains have set in this season, sending copious showers. From two to four inches of water fell Easter Sunday and a good soaking rain set in the Tuesday following, lasting 20 hours, precipitating about six inches of water. It came in a gentle, steady rain, giving time to thoroughly soak the ground to a depth of two feet. All crops are bound to do well this season. As to the possibility of farming in this region, there is no question. All that is needed is to plow, plant and attend to the crops properly; the rains are abundant."

Six inches of rain in twenty hours, coming gently and following two days after another good rain of two to four inches—about half the normal year's precipitation of that region in the space of three days was an achievement on the part of the weather god that needed the imagination of the optimistic chronicler to conceive and his pen to describe. This newspaper was managed and owned by the Burlington townsite company. Literature of this sort was widely circulated among prospective homeseekers in the middle and eastern states and it had its effect, for land hungry people did not trouble to analyze or seek confirmation of exaggerated claims. They took it for granted, after seeing the prairie at its best in a particularly wet season, that with such soil, such grass, and such smoothly level land, farming would be just what the boomers claimed, merely a matter of plowing, planting and cultivating—that nature would do the rest.

NO LOCAL WEATHER RECORDS.—There were no local weather records to fall back on, nor was there any other source of information which could have developed the truth about a variable climate and the necessity for careful conservation of every drop of moisture and about the other difficulties that are met under semi-arid conditions. Only ten years had passed since the last wandering band of Utes had committed murder and burned the homes of isolated settlers in the country south of Burlington; but twenty years since the old Starvation Trail, as the Smoky Hill route was known, had been traversed by stage line and ox-team caravans in long lines of prairie schooners bearing the legend "Pike's Peak or Bust." It was along this trail, a short cut where water was often scarce, that many returning

"pilgrims" finally abandoned the fight against adverse fortune and added the legend "Busted by Thunder."

WRECKAGE OF THE CARAVANS.—Bleached bones of oxen, warped hubs with broken spokes, rusted tires, black heaps of ashes from the campfires of buffalo chips, and the flotsam and jetsam of the battered caravan returning toward the home port in sore distress, marked this trail. Along here the Cheyennes and Arapahoes, riding down from the broken country along the Republican River, intercepted travelers going or coming, harassed them into giving up their property and often in a fight had taken scalps of white men and carried women and children off into captivity.

These scenes of the past were forgotten; the new comers knew nothing of the previous migration which had for its goal the mines of the mountains, and their only apparent obstacle to possession now was the presence of great herds of cattle and flocks of sheep.

GAVE UP THE RANGE.—The United States Government aided in clearing the plains for settlers by ordering stockmen to take down fences on government land and everywhere now pressure was exerted in favor of the settler as against the occupant of the range. The stockmen kicked back, but they finally submitted to the inevitable, giving up range which they could not buy and restricting their herds and flocks to sections not yet desired by homesteaders. The two pioneer railroads—the Kansas Pacific and the Atchison, Topeka and Santa Fe—had been built to meet traffic at the mountains and, incidentally, to handle the livestock business of the plains, but now came the Chicago, Burlington and Quincy, and the Chicago, Rock Island and Pacific, and the Missouri Pacific, all with an eye on development of the intervening country.

The land grants of the Kansas Pacific (later incorporated in the Union Pacific System), furnished an additional incentive for settlement. Since there was no coordination of effort, nor any pre-determined policy on the part of these agencies, the boomer plan of settlement was inevitable. Flow and ebb of the tide followed and each turn found a greater proportion of permanent farms established, a larger population in the towns and more certainty of final success in the conquest of the semi-arid plains.

DOUBTS WERE EXPRESSED.—Such conservative journals as the Colorado Farmer expressed doubt concerning the success of settlers on the plains. Under date of October 7, 1886, this journal stated that in northeastern Weld County at least 500 preemptions and homestead claims had been taken up and the estimate was that the county had 5,000 more people than the year before.

"Will it last?" asked the Colorado Farmer. "The future may be judged by the past. For ourselves, we shall wait and see and hope that,

there is no disappointment or disaster in store for the brave pioneers who have staked their all in opposition to the theories of the wise. Theory says that this country is a desert and that it is not possible to raise crops successfully or sufficient to sustain a farming population; that this country is only fit for grazing. This year it has been demonstrated that crops, good ones, of corn, oats, millet, alfalfa, potatoes and a variety of melons and squashes, have been raised and that the settlers who have planted crops have raised sufficient to sustain themselves and their stock."

PAYNE TOURS THE PLAINS.—In the language of J. E. Payne, Superintendent of the Plains Sub-station at Cheyenne Wells, "Almost the whole of eastern Colorado was settled quite thickly during the years from 1886 to 1889."

The State Experiment Station began to give attention to dry land farming problems soon after its establishment. Bulletin number 59 by Mr. Payne contained field notes from his trips through eastern Colorado and his experience of the several years preceding 1890 in making tests on the Cheyenne Wells station of plants and methods adapted to the region.

"Natural conditions seem to have fitted this region for a grazing country, but the hardships encountered by people in gaining a living in the crowded eastern states have pushed people into what the cowman once thought his exclusive domain. After settlers got in, many found that, hard as conditions were on the plains, they could do better here than they could with the same capital in any other place with which they were acquainted. These men have built themselves homes and, in a measure, made the nomadic life of the old-time cowboy an impossibility in the future." Thus wrote Payne from observation.

TURNED TO STOCK RAISING.—He pointed out that nearly all the settlers who remained have been compelled to turn their attention to stock raising on account of crop failures during some years and low prices other years. His suggestion, as a solution of the settlement problem, was that accepted in later years, namely: "Free range, cheap rough feed and inexpensive warm stables will help them to make winter dairying profitable. When they get to this all products will be sent to market in condensed form and the importance of the problem of transportation will be reduced. The country can support sufficient population to supply good schools for the children. Each family can have a small garden, a few fruit trees and some small fruit for home use."

This doctrine became the accepted method and it is still being preached as the best means of securing permanent settlement on the dry land farms.

CONDITIONS IN 1890.—Payne's description of conditions which he found in 1890 will be of interest: "Lansing, Idalia, Friend, Cope, Arikaree City, Thurman, Lindon, and Harrisburg all aspired to be large cities, county seats or railroad centers. Lansing

has disappeared and left only a few cellars to mark its site. Idalia still has two stores, two blacksmith shops, a school house and a few dwellings. At Friend one old building now used for the school remains. Cope still has a store, a few dwellings and a school.* One store building (now used as a resident by a family of four), still stands on the site of Arickaree City and Arickaree P. O. is located on a ranch eight miles away. About Lindon, nearly all the land for miles around was once filed upon. Failure to get water in necessary quantities caused the whole country to be depopulated. At one place I drove 18 miles between Cope and Lindon without seeing a house. The site of old Lindon is now marked by a few heaps of earth and a few holes in the ground. Lindon Postoffice is four miles southwest of the old townsite and the nearest house is two miles away. At Harrisburg, one family still lives. Thurman, also called Stone City, once had two banks and two railroads were surveyed through it during boom times. Now one family lives in Thurman. But a colony of hardy Mennonite farmers still hold claims near enough together to make lanes necessary. Two lanes cross at Thurman postoffice. These farmers are all getting to be quite well to do. They make stock raising their main business, but they usually raise grain and always produce plenty of rough forage for their cattle. By these people the Russian thistle is considered a friend. If the wheat crop fails, the Russian thistle grows among the wheat and Russian thistle and wheat mixed, make excellent feed. Before the introduction of the Russian thistle they had no winter forage when the wheat crop failed."

MANY TIMBER CLAIMS.—Thousands of claims had been planted to trees under what was known as the Timber and Stone Act. Payne's report of these claims was that only a few groves remained in thrifty condition. He inspected several hundred timber claims and decided that the trees which withstood conditions best were the ash, honey locust and black locust. He mentioned Cope's grove at Cope on the Arickaree bottom, which is today an outstanding example of tree planting success. In 1890 about twenty acres had been planted to trees which ten years later were found to be from forty to fifty feet high, some of the cottonwoods then being fifteen inches in diameter. The varieties noted by Payne were cottonwood, box-elder and ash. However, in 1900 only five or six acres of the original planting remained in thrifty condition.

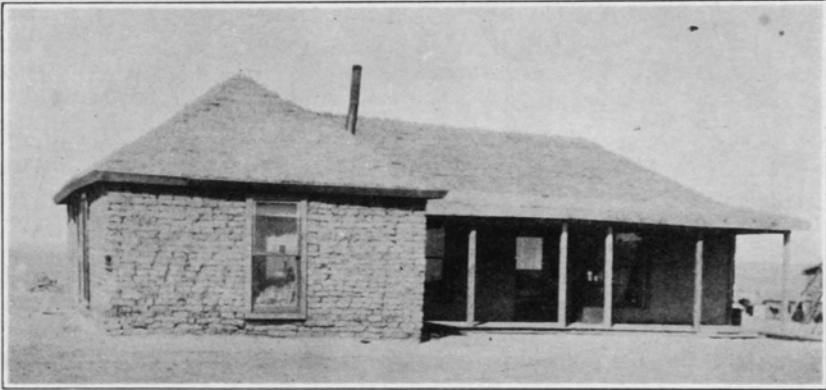
Hundreds of orchards were set out during this first big movement of settlers to the dry lands. Very few survived. The Payne report indicates that many orchards were kept in good condition until 1893, when they were about five years old. Dry weather during a three-year period, ending with 1895, killed most of the trees. The conclusion given by Payne was that cherries, currants, plums and gooseberries could be produced in moderate quantities without irrigation. Apples and peaches, however, were not considered sure.

USED WINDMILL IRRIGATION.—The report also mentioned farms where supplementary irrigation had been successfully used, among these being the ranch of John Rose near Seibert. The water was pumped by a windmill from a well 18 feet deep. A second well was added and a small storage reservoir built, from which Rose irrigated two acres of garden and fruit. Another successful irrigator was Peter Eckert, near Thurman, who

*Cope and Idalia again revived and are prosperous villages today.

had two wells, each over 100 feet in depth. The water was pumped by a windmill into reservoirs for storage. This reservoir was on a hill and the surrounding land was terraced, so that it could be easily irrigated by gravity. A few small ditches had been taken out of the south fork of the Republican to water trees and gardens.

BUILT HOUSES OF SOD.—Sod houses were the prevailing type of dwelling erected by the homesteaders in eastern Colorado. The adobe, or sun-



Substantial sod house on the prairie of Eastern Colorado.

dried brick, of southwestern Spanish origin, was old in Colorado when white settlement began, this type of construction having been used in building the old trading posts and trappers' headquarters in the early part of the nineteenth century. Sod, or turf, construction came in later with the arrival of emigrants across the plains from the East. Sod houses were common in Kansas and they became more and more so on the Colorado plains as homesteading increased.

DUGOUTS, TOO, WERE PLENTIFUL.—Dwellings in the first towns built near the timbered foothills were chiefly of log construction. The treeless prairies, however, forced settlers to use whatever came to hand, or to do as the trappers did—build a dugout if the contour of the ground permitted digging into a bank or hillside. On the level prairie, however, it was most convenient to build of turf or sod and there are many sod houses still in use. They are warm in winter and cool in summer and they have the decided advantage of economy. Walls are made two feet thick. The sod is turned up with a plow and cut into the shape of bricks about four inches thick and sixteen to eighteen inches long.

The frame and roof of such a dwelling would depend on facilities at hand. Poles were used where lumber was not available and many roofs

were made of brush, topped with a layer of sod. In fact, even a board roof would be covered with a layer of sod, and it was no uncommon sight to see grass and cactus growing on top of sod houses on the plains. The inside walls were dressed smooth with a corn or hay knife and plastered with a mixture of clay and lime. Doors and window frames came from the lumber yard. Partitions of flimsy construction could be made to divide the dwelling into suitable rooms, but often there was only one large room, with divisions by canvas sheets, old carpets or blankets, as occasion demanded, or size of family dictated.

Dugouts were sometimes built on level ground, the underground portion being five or six feet deep, with a super-structure of three or four feet and a slanting entrance, carried out far enough to allow for a door. These dugouts were even warmer than a sod house during a blizzard, but they were subject to flooding by the occasional heavy downpour of a summer storm. Dirt floors were the rule in these humble dwellings, the ground packing down so smooth and hard that it could be swept like a wooden floor.



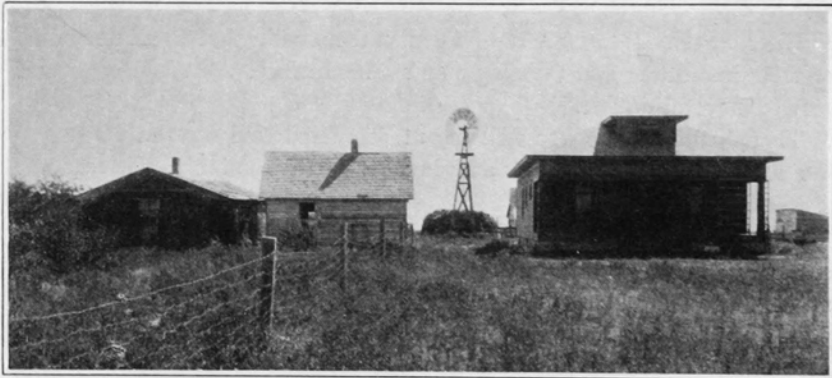
A homesteader's first habitation in southern Colorado. Dugout with superstructure, built from un-trimmed stones picked up in bed of dry water course.

COW-CHIPS FOR FUEL.—Not only did the early plains settlers thus show thrift and resourcefulness in making use of what was at hand to build their dwellings, but they also followed the custom of the trappers in using dung for fuel. The trappers who followed prairie streams found an ample supply of buffalo-chips on the treeless plains and the homesteaders used cow-chips after the buffalo disappeared. However, buffalo-chips were still found ten years after the last of the bison had been exterminated. The homesteaders came with at least a few cows and in the first year the cow-chips were necessarily of more value as fuel than as fertilizer.

NO WOOD OR COAL TO BURN.—The lack of timber was something that had not been emphasized when the land agent painted the prairie in glowing colors and many an emigrant from the woods of the Middle States was appalled to find here a country without fuel, with coal to be brought in from a distance at a prohibitive price. Sunflower stalks, corn stalks, cobs, stubble and straw had to be utilized to cook the food and keep the children warm until the family became accustomed to the new conditions.

DIET OF MUSH AND MILK.—Mush and milk was the diet that sustained many a family through the pioneering period, although those properly equipped to farm soon had a garden under way and a supply of eggs and meat coming from a flock of hens, with plenty of salt pork in prospect later. The obstacles to settlement which nature had set up in a semi-arid climate without living streams and remote from sources of irrigation water, were serious enough, but the problem was made doubly hard by the fact that free homesteads and cheap railroad land attracted a class of people who were generally without capital, and often without farming experience. That the plains have been subdued by these people over all the natural and artificial handicaps, is a tribute to the pioneer spirit which still survives, for the job is not yet finished, though prosperous communities abound where all was wilderness thirty to forty years ago.

OPTIMISM AND PESSIMISM.—Optimism and pessimism waxed and waned with varying rainfall from season to season. The movement of the eighties had come and gone and in its wake there rang a chorus of "I told



Progress of a Plains Farmer. The three homes of J. H. Wilterdink near Fleming. First the sod house, then the little frame dwelling and now the modern cottage.

you so," for which the stockmen furnished vocal volume. They knew it could not last and they were glad now that the public, in the year eighteen hundred and ninety, had come to the final conclusion that all of eastern

Colorado, except the narrow margin along the rivers, was one vast pasture. While even that was now being depleted by overstocking, the breaking up of the country with the plow had been a terrible blunder and, while they felt truly sorry for the suffering homesteader, it was all for the best!

So they talked and expression was given this opinion by the farm press. The Colorado Farmer had always been skeptical and, while willing to be convinced, its editor did not register disappointment after the first apparent failure of dry farming. Field and Farm had been a little warmer toward the settlement rush, but its columns, too, early in 1891, reflected the pessimism that was general.

A STRANGE HALLUCINATION.—“It is a strange hallucination that binds the rainbelt settlers to their chosen country. On the verge of starvation from repeated failures at crop growing, they cannot be induced to leave, but ask for contributions of seed, that they may try again the unhappy experiences of the past. They are like the lost man in the desert who sees the mirage and strives again and again to catch up with it.”*

The truth was, most of these settlers would have been glad to leave had they been able to dispose of their land and their goods and chattels. There was a relief bill pending in the Colorado legislature at the time. Its purpose was to make an appropriation for creation of a seed fund to stake the settlers in another attempt to grow wheat. Field and Farm advocated passage of the bill, but declared the money should be used to help the people get back to their old homes and not to fool them again by persuading them to plant another crop.

WOULD SEND THEM BACK.—“Furnish them with what may be required for their immediate and pressing wants and then aid them and encourage them to move elsewhere.”†

Though this advice was well meant, it offered cold comfort for people who had been invited, urged and inveigled into coming to Colorado to take up dry land farms.

These conditions, approaching utter failure, aroused the spirit of investigation and set on foot a series of events that culminated finally in the success of dry land farming. It was no sudden process, but a slow development which was marked by trial and error.

THE RAIN MAKERS APPEAR

Taking advantage of the unbounded optimism of the plains settler, when not in immediate distress, the “rainmakers” who came upon the scene about this time, found many willing to believe that if prayer and incanta-

*Field and Farm, February 14, 1891.

†Field and Farm, February 21, 1891.

tions failed to move the weather god to action, some hocus pocus with mysterious chemicals, operated by a genius with an inventive imagination and a liberal endowment of gall and self confidence, might make the clouds ashamed longer to float lazily over a brassy sky without dropping a beneficent rain on the righteous and long-suffering homesteader, as well as the unjust scoundrel who had located them.

MELBOURNE THE RAIN FAKIR.—Frank Melbourne, who came to be known as the rain fakir, operated in eastern Colorado during the summer of 1892. He was an Australian and had associated with him Frank Jones. They undertook to produce rain by artificial means in the neighborhood of Willard. This was in accordance with a contract made with certain people of Logan, Phillips and Sedgwick counties, Colorado, and Keith County, Nebraska. The contract specified that Melbourne should, within 72 hours, cause it to rain not less than .51 of an inch at Holyoke, Julesburg and Fleming. Committees were stationed at these points "to collect data and make a full report."

Melbourne was to get six cents an acre for wetting the cultivated lands. On Tuesday of the week set for the rains a few clouds appeared, but no rain fell. About 4 o'clock Wednesday afternoon clouds again gathered and there was a slight sprinkle. A contemporary account says: "Before enough rain fell to quench the thirst of a grasshopper, the rain ceased."

DEPENDENT ON HICKS' ALMANAC.—It was discovered that the dates selected by Melbourne were identical with the long-distance weather forecasts of the late Irl R. Hicks, who flourished at St. Louis for many years as a weather prophet and publisher of an almanac that had many rural readers, who believed these long distance forecasts to have a scientific foundation. It appears that on these occasions Hicks failed, as did Melbourne.

Melbourne's plan, ostensibly secret, was to burn chemicals on a raised platform in the open country. He got nothing for his useless attempts. Two years later he was found dead in a hotel room at Denver, leaving only his initials, "F. M.," on a suit case as identification. His death was attributed to suicide.

USE OF EXPLOSIVES.—The use of explosives in the attempt to cause precipitation had been tried several years before in western Kansas. Three years later further attempts of this kind were made, the rain maker being Clayton B. Jewell, who persuaded the Chicago, Rock Island and Pacific Railroad Company to fit up a traveling railroad laboratory, comprised of three cars, equipped with devices of various kinds, designed for coaxing moisture from the clouds. This enterprise was taken seriously enough by

the Department of Agriculture at Washington, to send an agent to the plains country to investigate Jewell's methods of rain making. As no rain was made, there was nothing to report.

INTERNATIONAL DRY FARMING CONGRESS

For a dozen years the International Dry Farming Congress was an active factor in the development of semi-arid agriculture. This organization was formed at Denver January 24, 25 and 26, 1907, and was first known as the Trans-Missouri Dry Farming Congress. In later years it became known as the International Dry Farming Congress, delegates being admitted from all nations of the world in which semi-arid agriculture was a problem. The official call for the first meeting was signed by Jesse F. McDonald, Governor of Colorado, and Arthur Williams, Secretary. The first session was called to order by ex-Governor McDonald, who had been succeeded by that time as Governor of Colorado by Henry F. Buchtel. The call stated that the time had come for united action and official encouragement in the reclaiming of a great portion of the semi-arid acreage of the western states. It was further stated: "To populate our vast acreage, where irrigation is not possible, will insure the continuance of prosperity throughout our western states, and will increase the commerce and stimulate the demand for the products of our factories to such an extent that every commercial industry in the trans-Missouri states will be favorably affected."

GOVERNORS NAME DELEGATES.—Governors of all western states and territories were authorized to appoint delegates as were the mayors of cities, county commissioners, national and state agricultural associations, railroad companies, chambers of commerce and other commercial bodies. United States senators and congressmen, the Secretary of Agriculture and his assistants, governors of states, officers of state agricultural colleges and state universities engaged in agricultural work, officers of experiment stations, state engineers, and members of state land boards were entitled to membership in the congress. It was presumed that the list of delegates appointed by governors and county commissioners would include practical farmers. The first session brought out a great diversity of opinion regarding the practicability of dry farming but the general tone of the papers and addresses was conservative.

CHILCOTT OUTLINES WORK.—E. C. Chilcott of the United States Department of Agriculture, who was in charge of dry land experimental work, outlined what the government was doing at the various field stations already established in the Great Plains area. He described this area as being bounded on the south by the 32nd parallel of latitude and on the north by the British possessions, being 1,100 miles long north and south,

with an average width of 300 miles and, therefore, including 330,000 square miles of land. He stated that throughout this area climatic conditions during the growing season were remarkably uniform, explaining that the altitude in the southern portion is from 3,000 to 4,000 feet while in the northern portion it is only about 1,000 feet, this difference in altitude compensating for the difference in latitude. The precipitation also is re-



*Hauling in the shocks of winter wheat grown without irrigation
on H. M. Elliott's farm, Idalia.*

markably uniform throughout the area. He explained further that the experimental work by the Department of Agriculture was carried on in cooperation with the state experiment stations, a number of which had been established before the Department became active in dry land work. Eight stations had been established at the time of this first session of the Congress and seven more were in prospect.

JARDINE ON PROGRAM.—Other agricultural experts who appeared on the program at this session included W. M. Jardine, then connected with the Utah Experiment Station, who in 1926 is Secretary of Agriculture.

A statement of the dry farming problem made by F. W. Roeding of the Department of Agriculture, quoting Dr. Elwood Mead, summed it up as follows: "Between the line of 20 inches average annual rainfall, that is, about the 100th meridian, and the Rocky Mountains, there is a strip of land reaching from Canada to the Gulf of Mexico, embracing about 300 million acres, which for agriculture is debatable ground. This semi-arid belt and other separated semi-arid areas farther west, present one of the greatest problems of American agriculture. The area is great, the soil is deep and exceedingly fertile, and the climate healthful and agreeable, aside from lack of moisture. Men need it for homes. All interests are eager to

see these areas settled, provided the settlers can be self-supporting, or to avert this if settlement is to mean disaster. From all classes come the questions: What methods will make the most of these lands? How can they be made to support the largest number of people and give them the greatest measure of human comfort?"

- OPPOSITION TO DRY FARMING.—It was around these questions and their answers that debate was continued during the three-day session, bringing out many opinions and many and varying suggestions and panaceas for the solution of the problem. At times the discussion grew acrimonious. The charge was made that men interested in irrigation and especially some of the experts connected with experimental work at the various western stations were too conservative and were hampering development of the semi-arid lands. As evidence of this opposition State Senator James W. McCreery of Greeley was quoted by one of the delegates as follows: "Good results have been obtained by carefully conducted experiments and under exceptional conditions, but it has not been demonstrated and cannot be demonstrated that general farming can be successfully and profitably conducted upon the arid plains without irrigation."

Objection to this statement came from several of the delegates, some of them interested in selling land, others unbiased in that respect and who had been able to prove the practicability of dry land farming on their own lands.

THE CAMPBELL SYSTEM.—Prof. H. W. Campbell, originator of what was called the "Campbell System" of dry land farming, spoke about the method of soil culture which he recommended as the solution of the problem. Campbell had been employed by various railroads to conduct demonstration farms and his work had attracted considerable attention. It was attacked by some of the state and federal experiment station workers as being scientifically unsound.

The constitution which was adopted at this session set forth objects of the association as follows:

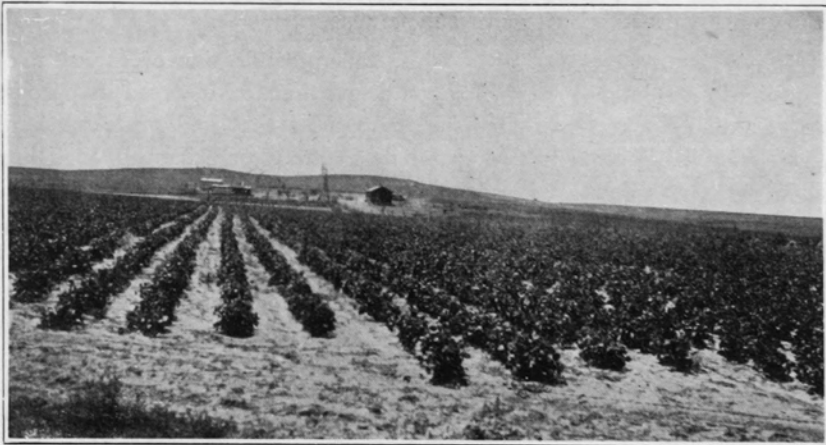
1. The consideration of best methods of rendering the lands of the semi-arid West productive where ditch irrigation is impracticable.
2. The determination of the best agricultural methods where crop and livestock farming is practicable.
3. To encourage the establishment of experimental farms to determine the limitations of scientific soil culture and seed selection; these farms to be operated under the direction of state and federal experiment stations or private enterprise.
4. To assist the prospective settler in every practical way to determine what land under scientific soil culture methods is susceptible of crop production.
5. To encourage the use of every conservative, practical method for developing the semi-arid regions of the West.

Officers were elected as follows: Fisher Harris, Utah, president; J. L. Donahue, Denver, first vice-president; A. R. Briggs, California, second vice-president; Colonel Bell, Wyoming, third vice-president.

PUT UP FIGHTING FRONT.—During the early years of the Congress which flourished for a decade as an organization for development of dry land farming, a fighting front was shown and an aggressive campaign waged to beat down opposition to settlement of the plains. Range stockmen had by this time ceased organized opposition, and such objections as came from that source were of individual rather than general character. Whatever differences of opinion remained as to the practicability of dry land farming were along the line of methods; that the country was permanently in possession of the dry landers was a fixed fact admitted even by those who had long contended that the plains were fit only for the grazing of cattle and sheep.

Within the ranks of those attending the first and subsequent sessions there existed a wide range of opinion as to the best methods for subduing the semi-arid lands, and groups centered themselves around certain individuals who claimed to have mastered the science and evolved the one and only way of making the prairie productive without the use of moisture, other than that which fell from heaven.

APPROACHED RELIGIOUS ZEAL.—The enthusiasm of some of these adherents of the various systems and panaceas approached religious zeal.



Field of dry land Pinto beans in eastern Weld County.

Anyone who had the temerity to suggest even supplementary irrigation from wells was looked upon by these enthusiasts as a heretic, while irrigation from a ditch seemed downright sinful. One delegate from western Kansas

said it was ten to forty miles to running water in his county. "We haven't a foot of irrigating ditch in our county and we don't want it," he said. Another delegate said he had some irrigated farms, but he wanted to sell them before the development of dry farming caused irrigated lands to depreciate in value.

B. C. Buffum, at the time of the first Congress an agronomist on the Wyoming Experiment Station, was asked about tests made on that station with winter irrigation, and his reply was: "Yes, we have tried winter irrigation with considerable success, but I have avoided saying anything about winter irrigation at a dry farming Congress."

KEPT ON EVEN KEEL.—Offsetting the enthusiasts, however, were many careful students of the problem who succeeded in keeping the Congress on an even keel. While the formal resolutions submitted by the committee appointed for that purpose did not endorse any particular system of dry land farming, such a resolution was brought up just before adjournment and passed unanimously at a time when most of the delegates had departed. This was an endorsement of the Campbell system, the resolution being maneuvered by Chairman J. L. Donahue of Colorado, who turned the gavel over to Vice-President Briggs and offered the following: "Resolved, that this Trans-Missouri Dry Farming Congress goes on record as approving the fundamental principles of soil culture as practiced by Prof. H. W. Campbell of Bethany, Nebraska."

The motion was seconded, put and carried without a dissenting vote and thereupon a motion to adjourn prevailed.

FARMING BY RESOLUTION.—While this promulgation of a system of farming by resolution had no effect on actual practice, it served its purpose as advertising for certain land-selling agencies that had made much of "the Campbell system" in their pamphlets. Professor Campbell, in telling about what was done on his demonstration farms, had succeeded in convincing many that nature had yielded to him her secret of profitable crop production under scant rainfall. Land agents spoke glibly of "the Campbell system," the newspapers were full of it, booster literature predicated its argument for settlers upon the system, and yet the deliberations of this first Congress, in which Campbell was an active factor, do not leave us a clear exposition of the "system," though Campbell spoke at length upon his work and answered many questions that indicated his sincerity and earnestness.

WHERE UTAH PIONEERED.—More to the point were the discussions led by such men as Dr. John A. Widtsoe of Utah, from which state come the earliest records, for Western America, of farming without irrigation under semi-arid conditions, and of E. C. Chilcott of the United States Depart-

ment of Agriculture, Dr. Vernon T. Cooke, then dry farming demonstrator for Wyoming, who had acquired his experience in twenty years of practical work in eastern Oregon; W. H. Lauck of the Eads sub-station of the Department of Agriculture, where tests in supplementary irrigation were being made, and of Robert Gauss of Denver.

Mr. Gauss was editor of *The Denver Republican*. He sent a paper to be read to the Congress, reviewing his experiments in plant breeding for drouth resistance made on small plots at his home in the suburbs of Denver. Gauss had suggested in an editorial in *The Republican*, late in the eighties, that work be done in plant breeding to meet one of the problems of dry farming, and in 1896 he began the work on his own initiative.

GAUSS' METHODS EXPLAINED.—He summarized the philosophy of it in the following statement:

I aim to take advantage of whatever variations in the direction of greater capacity to resist drouth may be disclosed and to select seed from those plants which exhibit this capacity in the most marked degree. It should be observed that this process is one of adaptation to adverse conditions and that hence it involves a sacrifice of some kind. It were idle to expect a plant to achieve as great a growth with a scant supply of moisture as it would were all the conditions of soil and moisture and temperature favorable. Fortunately, what may be called the law of adaptation to the adverse, may be invoked. It was clearly presented a number of years ago by Professor Geddes, the eminent Scotch naturalist. Briefly, it may be stated to be the law by which a plant sacrifices its vegetative in favor of its reproductive functions. I believe a tendency under adverse conditions to sacrifice everything else in favor of reproduction is more or less true of all species—with this corollary, that where the other functions are for any reason highly developed, it is likely to be, relatively speaking, at the sacrifice of the reproductive. An illustration of the latter supposition is seen in the case of wheat, where a very heavy growth of straw is usually accompanied by a disappointing yield of grain. It would seem that the reproductive responds less promptly to favorable and yields less readily to unfavorable conditions. So, when a wheat plant attempts to adapt itself to a scant supply of moisture, it sacrifices, first, the straw, since the grain or seed contains the reproductive power of the species.

Gauss then went on to explain that he was experimenting with seven different kinds of wheat besides the two varieties into which his own had been developed. He began these experiments in the spring of 1896, starting with Improved Fife, which he obtained from the Agricultural College at Fort Collins. Oats, rye and two species of barley were added to his grain tests and he was experimenting also with sugar beets, potatoes, corn, field peas and alfalfa. He had secured from the Moqui Indians of the Southwest different varieties of colored corn, which had been grown in desert regions for centuries, expecting to find a variety of value under semi-arid conditions. "It has been dry farming from the beginning," he said, "And I have never yet had a total failure from drouth."

EXPERIMENT STATIONS AT WORK.—By the time that Gauss' individual efforts were ready to bear fruit, similar work by the experiment stations and on demonstration farms as well as private farms, had become available

to the entire dry land region. His work served an excellent purpose in directing attention to the fact that the so-called soil culturists and system advocates were tackling the problem from only one angle and that dry farming was a problem involving soil, plant and moisture which could not be solved by methods of culture alone.

During ten sessions of the Congress its identity as a factor in dry land farming was maintained. After the opening meeting in Denver, succeeding sessions were held as follows: 1908, Salt Lake City; 1909, two sessions, Cheyenne, Wyoming, and Billings, Montana; 1910, Spokane, Washington; 1911, Colorado Springs; 1912, Lethbridge, Alberta, Canada; 1913, Tulsa, Oklahoma; 1914, Wichita, Kansas; 1915, Denver; 1916, El Paso, Texas; 1917, Peoria, Illinois. After the Peoria session permanent headquarters were established at Kansas City and the name of the organization was changed to International Farm Congress, and its identity with dry farming lost.

BURNS BUILT IT UP.—Under the leadership of John T. Burns, who served as executive secretary during the period of its greatest influence, the Congress became international in fact as well as in name. Not only did it include in its membership delegates from Canada and Mexico, but it was world-wide in scope, bringing together men of scientific mind as well as the practical developers from every semi-arid region of the globe. No other agricultural society in America ever has approached it in world-wide appeal and in actual attendance of delegates, officially appointed by foreign governments. John T. Burns is given credit for this achievement.

INTERNATIONAL IN FACT.—It was at another Colorado session (Colorado Springs, 1911) that the Congress proved itself international in character. The officers elected there for 1912 were as follows: Dr. John A. Widtsoe, Logan, Utah, international president. American vice-presidents: Dr. J. M. Hamilton, Montana; John Lennox, Colorado; Dr. E. A. Burnett, Nebraska. International vice-presidents were appointed for the various Canadian provinces, for India, the Union of South Africa, Brazil, Chile, France, Hungary, Mexico, Russia, Turkey and Uruguay. At this session it was decided to raise a foundation fund of not less than one million dollars for the support of the organization, and to urge all nations of the world that include within their boundaries large areas of semi-arid land, to make liberal appropriations in support of the work of the Congress. This ambitious plan of financing was never accomplished, though prospects in 1911 seemed favorable.

MEMBERSHIP OVER 13,000.—The membership of the body at that time was 13,500. There were 1,034 delegates enrolled at the sixth session in Colorado Springs, there being representation from 46 states and nations,

the foreign delegates coming from Australia, China, Hungary, Germany, Russia, Mexico, Brazil, Belgium, India, Uruguay, the Dominion of Canada, and the provinces of Alberta, British Columbia, Manitoba, Ontario and Saskatchewan.

The organization was beginning to function in sections, as it had become unwieldy. These sections included soil tillage and machinery, crops and breeding, agricultural forestry, livestock and forage, agricultural education, farm management, scientific research, rural homes and conferences of agricultural colleges and experiment stations. While in its first years, the



How windmill power is used to irrigate flower garden and lawn in the dry-land regions. Home of John Wright, Sr., northwest of Holyoke.

Congress was dominated by the development idea, by 1911 it had become a quasi-scientific society, and its discussions were becoming more or less technical. Foreign governments sent scientific men as their representatives, and there was evident now a search for fact rather than, as in the earlier years, a desire for complete formulas to meet all problems of dry land farming.

ITS WORLD-WIDE PROGRAM.—Justification for the world-wide program was brought out in the address of Dr. J. H. Worst, president of North Dakota Agricultural College, and the president of the Congress during 1911, from which the following is quoted:

Within the shadow of this vast mountain range we have assembled from many states and countries to discuss ways and means whereby—and with due deference to the influence these mountains exert in the matter of limiting atmospheric precipitation over millions of acres of land—whereby we may make them nevertheless productive and habitable. For surely if Nature unaided—in wild abandon—could build up a soil of such unexampled fertility, notwithstanding the paucity of moisture, that is grudgingly permitted to pass above these snowclad barriers, assuredly science and skill, for beneficent enterprise, should be able to improve upon Nature's processes to the extent of producing profitable crops of vegetables, fruits and grains. And by the same token, millions upon millions of acres elsewhere in Mexico, in South Africa, in Russia, India or South America—lands naturally semi-arid on account of limited rainfall, the result also of natural causes, which human agencies cannot remove—in like manner, may be rendered productive. * * *

The fact that nearly half the earth's surface is visited with less than 20 inches of annual precipitation, makes dry farming a necessity. But a fraction of this vast area is susceptible of irrigation under any circumstances. What cannot be irrigated must be cultivated by dry farming methods or remain uninhabitable and practically useless; for human genius cannot remove natural barriers, such as mountain ranges, which place a limit upon precipitation. It can, however, suggest methods of agriculture that may be adjusted to local conditions; methods of tillage that will prevent unnecessary evaporation of soil moisture, together with the breeding of plants themselves economic of moisture. These factors, taken together, will tend to make agriculture not only successful but profitable, with less rainfall than in humid districts where, as a matter of fact, the total precipitation during the year is frequently far in excess of the needs of the growing crops. * * * The further we press our investigations and scientific research, therefore, the more apparent seems the wisdom of God for thus preserving, by means of limited rainfall, the precious plant food over so large a portion of the earth's surface. What hitherto has been looked upon as the curse of drouth may yet, in the light of science, be interpreted as the mercy of an ever-ruling providence. * * * That limited rainfall is a conserver of natural fertility is beyond question. Nature evidently, in order to be economical of the essential elements necessary for the production of plants, requires more thought and labor to force the soil to give up its wealth in all regions of limited rainfall. That there are vast regions of limited rainfall, therefore, rather suggests the wisdom of the Creator.

CONSTITUTION IS REVISED.—The revised constitution of the Congress gave its objects in 1911 as follows:

To encourage a better understanding of the methods by which dry land farming can be successfully conducted; to create a great co-operative educational propaganda in behalf of agricultural development; to urge closer co-operation between the actual farmer and the federal and state agricultural departments in experimental, demonstration and exploration work; to encourage increased appropriations, both state and national, for the establishment and maintenance of demonstration and experimental farms and other forms of demonstration work in every dry farming country; to assemble and publish from time to time the legitimate information relative to the accomplishments or failure in dry farming districts in every part of the world, and to place in the hands of its members information helpful in educating the farmers to produce profitable crops under scientific methods; to encourage the teaching of the basic principles of the science of farming in the public schools, etc., etc.

That this organization was a force in stabilizing development need hardly be said. That it was short-lived after taking on a world-wide character was unfortunate. Its decline was due to lack of proper financing, the endowment failing to materialize, and without practically unlimited means it was impossible for a voluntary organization to carry on the work of reclaiming the earth's unfavored areas through co-ordinated international effort, however ideal the conception and beneficent the purpose and plan.

HOW PARSONS PROVED IT

While townsite boomers were doing damage to the reputation of the state, and bringing dry farming into disrepute by over-statement and exaggerated claim, and rain fakirs were fooling the credulous, work of another sort was being done by practical men, who realized the limitations of the climate and had some knowledge of methods used in other parts of the world to overcome the handicaps of short rainfall and high evaporation. One of these men, whose example stands out and whose work has been a noteworthy accomplishment, deserving of perpetuation in these pages, is E. R. Parsons. In 1926 Mr. Parsons lived in retirement at Placentia, California. Not only did he prove by practice in Colorado that agriculture could be made to pay under the limited rainfall of the western plains, but he wrote about it fully and clearly over a long period of years, thus adding measurably to the limited technical literature on a subject that must become increasingly important to the world, as more and more of the arid lands are called upon to sustain population.

In 1921 Mr. Parsons gave *The Western Farm Life* a statement concerning his experiences in dry land farming. Following are quotations from this article:*

STARTED IN SOUTH AFRICA.—“My first experience in actual farming on my own account was in the colony of Natal, adjoining the Transvaal in South Africa. The climate there is similar to that of California, there being a dry and a wet season. It was there that the moisture problem first began to interest me, for after the rainy season was over, I found that the trees still lived and grew and that on deeply plowed land, crops continued to grow much longer than on land plowed shallow. As I had come from a deep-plowing country (England), where there was nothing remarkable about producing 600 bushels of potatoes or 60 bushels of wheat to the acre, I naturally plowed my land as deeply as possible. I cultivated it as I had seen it done in England and raised good crops, sometimes two crops on the same land the same year. I learned the trick of carrying over moisture to use in the dry season. I farmed there four seasons, until 1877.”

Mr. Parsons left South Africa for Colorado in 1880, renting a ranch at Morrison. In 1883 he went to California to investigate dry farming methods and he then decided that fallowing, combined with deep plowing, “made dry land farming a sure thing.”

HOMESTEADED IN 1886.—Going on with his story: “I came back to Colorado and homesteaded 160 acres near Parker in 1886.† My capital at that time amounted to \$2,000. I started plowing and breaking sod as soon as I got on my place. At first I had only two horses, but they were heavy teaming horses from Denver, weighing 1,400 pounds each. I broke my land nine inches deep and of course it was slow work; sometimes I only broke up a quarter of an acre a day. The neighbors thought I was just some new style of crazy Englishman. They enjoyed the joke and so did I—for I knew what was coming and they didn't. I had the privilege of laughing last. Some rye that I ran in on the sod after it was thoroughly torn to pieces by

**The Western Farm Life*, Denver, March 1, 1921.

†Location near the mountains and altitude of 5,800 feet gave the Parsons farm some advantage over farms on the open plains. The rainfall averages 14.5 inches, but evaporation is not so great there as at lower elevations where winds are more constant.

disking and harrowing, making the ground nearly as smooth as old land, grew seven feet high the following June. Some wheat I planted for chicken feed grew five feet high and corn, which I had planted, one in a hill, forty inches apart, grew big ears and many of them. This was in an average season. By this time I had perfect confidence in dry land farming. I had done it in Africa, on the ranch near Morrison, and I had done it at Parker. I did not need more proof."

BUTTER AND EGG INCOME.—Parsons went on to relate that he bought ten cows and raised a flock of 100 chickens, and that the second year after starting the eggs paid the grocery bill. Later on he increased the flock, clearing in one of the early years about \$157 from eggs and pullets and \$225 in butter, or \$400 in all from these two supplementary sources of income. The farm was gradually expanded, more land being added and more brought under the plow. By 1890 there were 20 acres in alfalfa and 50 acres in general crops and the cash income was in the neighborhood of \$1,000. One year 30 hives of bees produced more than a ton of honey. Expenses were low and the farm produced butter, eggs, milk, honey, pork, bacon and game, including rabbits and prairie chickens. A calf would be killed every fall to supply meat in addition to the pork.

DRY LAND ORCHARD.—The Parsons farm was far-famed for its dry land orchard. This orchard was started in 1894 and included cherries,



Dry land cherry orchard on farm of E. R. Parsons near Parker.

plums, apples and currants. In six years the income from fruit was about \$5,000. The orchard comprised 20 acres and Parsons estimated his expense at \$400 for trees, with \$150 as the cost of cultivation and pruning.

Ranch and Range, in August, 1911, gave an account of the fruit harvest on this orchard under the heading of "Tons of Dry Land Fruit." A quotation from this follows:

CHERRY PICKING DAY.—Cherry picking day at the famous E. R. Parsons dry land farm was a big success and it is estimated that more than a ton and a half of cherries and currants were gathered. The Parsons' farm has the only fruit in this section and it is wanted so badly for home consumption that none of it ever gets into the markets. On a certain day the neighbors gather for a big picnic, coming from many miles around, strip the trees and vines, and pay Mr. Parsons 20 cents a gallon for the privilege. * * * Mr. Parsons keeps moisture in his soil by mulching; that is, cultivating the land right after rainfall and making a loose dust covering that prevents evaporation. Preceding picking day, 100 business men came on an excursion from Colorado Springs to view the fruit trees before they were stripped and Mr. Parsons astonished them by making borings that showed soil beneath the mulch that contained 20 percent moisture. There are 2,500 cherry trees of the Morrello and Montmorenci varieties on fifteen acres, and 1,400 currant bushes of the London Market variety. The apple trees were hailed out while in bloom last spring and are not bearing this year.

DRY LAND ALFALFA.—In 1906 a Holstein dairy herd was added and from 50 to 75 two-year-old steers, which were purchased as calves, were fed on the farm. The farm then included 1,120 acres, 40 to 50 acres being in alfalfa. Part of this was on low ground, the roots reaching water and furnishing three cuttings a year. The upland alfalfa would yield one large cutting and one small one, the total hay production on the ranch being 100 tons a season.

"While I was on the ranch, from 1886 to 1911," said Mr. Parsons, "I never had to buy a pound of hay for the stock, and not a single crop ever dried out."

PHILIP HELD'S ACHIEVEMENT.—Another farmer whose pioneer work in crop production without irrigation on the Colorado plains attracted general attention was Philip Held of Logan County. Summer tillage for winter wheat production is the method for which Held became known. He wrote a booklet describing the method of culture used in storing moisture during the summer months when rains are most frequent in eastern Colorado, in preparation for sowing fall wheat.

During six consecutive years Held produced an average of nearly 30 bushels of wheat per acre on summer tilled land. His method was to double disk a stubble field early in spring; plow the field in June to a depth of seven inches; follow each day's plowing with the harrow to smooth the ground and retain the moisture. As soon as weeds appeared he would cultivate to a depth of $2\frac{1}{2}$ inches, destroying all sprouts but stirring only the top soil. He would cultivate again to break the crust and keep weeds down. The practice was to cultivate diagonally, instead of with the furrows. Ordinarily two cultivations were sufficient before seeding, that depending upon the season and the rains, the object being to keep the top soil loose and

prevent all weed growth. Seeding was done in September, usually about the middle of the month.

An observer who went over Held's farm during the summer of 1912 found 4 to 4½ feet of moisture in the soil that was being prepared by these tillage methods for winter wheat. Held's practice was to follow the winter wheat with corn and that in turn with spring grain, giving him three continuous crops on the summer-tilled land. His own explanation of results, as given in *The Colorado Farmer* of September 15, 1913, follows:

RESULTS FOR EIGHT YEARS.—For eight years, from an acreage of from 30 to 60 acres, my average yield of fall wheat has been 28⅝ bushels.

In order to give to this statement the importance which it deserves and that it may make the strongest possible appeal to those interested, I want to present the following detailed result, and to say that I have made affidavit to the correctness of the record. I will also give the amount of rainfall or precipitation in each year, so that the average, the minimum and maximum of available moistures may be seen and taken into consideration in the formation of an opinion as to the average conditions and their bearings on the successful operation of upland farming in this section of the country.

Annual yield of fall wheat on summer cultured ground for eight consecutive years:

	Bushels per acre	Precipi- tation
1905	29	22.18
1906	30	21.80
1907	30	16.57
1908	36½	25.23
1909	25	18.95
1910	28 2-3	12.88
1911	14½	16.05
1912	35½	20.44
Average yield for eight years, 28⅝ bushels.		

For a number of years I stood alone. In spite of the fact, known and rehearsed in every conversation on farming throughout the country, that I was raising good crops every year, others having constant and almost complete failures, but few availed themselves of the new method. This is a good illustration of the conservatism and non-progressiveness of human nature. * * *

Some of those who have conducted their farming along scientific methods for several years, under slightly more favorable conditions with respect to precipitation, have had larger yields than mine. My own highest yield has only been 36½ bushels per acre, while in several instances as high as 40 and one instance as high as 46 bushels were obtained. None of these people who had the initiative to start farming under the new method would think of trying to farm their land in any other way.

It is not only for one year that the effect of summer-tillage is available, but for at least the two succeeding years and probably for a much longer period. For instance, under normal conditions the moisture in a summer-tilled field is usually from three to four feet in depth. If the year following when the fall wheat is making its growth, the precipitation is normal, the conserved moisture from the previous season's summer-tillage remains mostly in the ground. Plant this same field into corn the next year and a large amount of the conserved moisture will be available for the corn. Again, by the proper and scientific cultivation of the corn a large amount of the precipitation of that year can be conserved and retained for the spring grains of the following year.

The assertion that in a properly summer-tilled field, moisture can be retained to a depth of from four to eight feet, will seem to the person unacquainted with the facts an impossible proposition. But this has been demonstrated again and again by actual tests.

Some time ago, I was greatly amused at a certain important person sent all the way from Hungary in Europe to investigate American methods of farming, and who

was directed to me as one who could likely furnish some desired information. Long and seriously did we dwell on methods, principles and conditions. It was a pleasant visit and not without profit. But when I insisted that with a 16-inch precipitation I had raised over 30 bushels of wheat per acre, and that I could show him moisture in my summer-tilled field to a depth of over four feet, he turned away and showed plainly that he regarded me as an imposter and said the thing was impossible. Whereupon, I took the good gentleman out, and armed with spade and post auger, proceeded to the fields. The first excavation was made in a field from which I had just harvested a crop of spring wheat, going about 10 bushels to the acre. Having had quite a heavy shower of rain a few days before, there was visible moisture to a depth of about eight inches and a slight trace to about twelve or fourteen inches. Below that the soil was ash-dry. Next we went across the road to the raw prairie and the slight trace of moisture reached less than six inches. Then we went to the summer-tilled field which was about ready to be seeded to fall wheat. First we dug down a foot with the spade and there was packing moisture. We went down another foot and the moisture was the same. Then we took the post auger and went the full length—four and a half feet from the surface—and there was still moisture enough to make mud-balls.

That took the important gentleman's breath, and his gesticulations became quite exciting. But he went his way rejoicing, and was very out-spoken in his praises as to the value of the demonstration.

PRESENT STATUS AND THE FUTURE

In 1926 the Year Book gave the total area of dry farming land in Colorado at 11,640,466 acres. This is less than one-half the area adaptable to cultivation under dry farming methods. Staple crops grown on these lands in 1925 included 828,553 acres of winter wheat, 119,384 acres of spring wheat, 1,356,594 acres of corn, 312,330 acres of barley, 128,330 acres of oats, 118,000 acres of rye, 266,271 acres of dry beans, 15,280 acres of potatoes, 12,000 acres of broom corn. Thirty to forty years ago this land was in grass, supporting herds of range cattle and sheep. Under tillage its productive capacity has been enhanced a hundred-fold as compared with the beef and wool once marketed from the grass.

This change from grazing to agriculture has not been accomplished without hardship. Even yet, with all the progress that has been made in development of drouth-resistant crops and in methods of soil culture, there are seasons when rainfall is so scant that farmers do not get yields that pay for the labor of planting and harvesting. To offset these abnormally dry seasons, there are other years when, under normal rainfall, or better than normal, a wheat crop may sell for more than the original cost of the land. This speculative feature has its attraction in drawing settlement.

While there are millions of acres of dry farming land in the state not yet under the plow, the indications at this time (1926) are that its development will come gradually, there being nothing in the agricultural situation to forecast another rush or boom. The remaining idle lands are not in blocks suited to mass colonization movements, but are mostly in individual small holdings; that is, in sections or less, much land is held by non-resident owners who homesteaded it, or acquired it by purchase from home-

steads, or bought when the railroad grant lands were sold. There is a considerable area also of state-owned land, mostly under lease for pasture, the sales of which are infrequent. These lands are held by the state for the benefit of the school fund. There are no government homesteads to be had in the plains area, but the maps show considerable areas classed as homestead land in the mountainous districts. Now that definite information is available from experiment stations and other responsible governmental agencies regarding rainfall and crops and methods essential to success in farming without irrigation, the tendency is for more conservative development than marked settlement of the plains a generation ago.

At Cheyenne Wells the state maintains a demonstration farm where the methods and crops that have proved successful and economical in dry land farming are practically applied and where any established farmer, or prospective settler may learn what safe farming under scant rainfall requires. Across the line in Kansas a little over forty miles eastward, is Wallace, at which point (then known as Pond Creek) R. S. Elliott of the Kansas Pacific conducted the first tests of dry farming in 1871, as has been related on previous pages of this chapter.

THE PLAINS SUB-STATION

The land for the Rain-Belt Sub-station at Cheyenne Wells was donated to the State Board of Agriculture by the Kansas Pacific Railroad in 1894, on condition that it be used as an experiment station. It consists of 160 acres, the N. E. $\frac{1}{4}$ of Sec. 29-14-44 lying just to the southwest of the limits of Cheyenne Wells. J. B. Robertson was employed as the first superintendent. He was a settler near Cheyenne Wells, who by his energy and knowledge of conditions had succeeded better than most of his neighbors. He had made a success in raising a grove, and trees were very scarce. During the first year the place was fenced, a house and horse barn were built and 30 acres were broken. Also a plot of ground around the house was plowed for orchard and grove. The land broken at that time was not well adapted to experimental work, as there was such a variation in the soils. There is no record of any crops planted in 1894. In 1895 an orchard was set out consisting of apples, peaches, cherries, plums, apricots, pears and some vines and berries.

The same year the 30 acres were planted to varieties of corn, cane, oats, barley, wheat, rye and beans. Extremely dry conditions resulted in practical failure of the crop, but the orchard thrived.

In the spring of 1896 J. E. Payne took charge of the station. He was a graduate of Kansas State Agricultural College and had specialized in soils and in problems relating to root development.

He continued varietal tests together with date of planting and cultural experiments and also worked on the problem of capillarity of different soils, the effect of cultivation on evaporation and the effect of windbreaks. He also studied movement of moisture in soil, and root development of plants.

On June 11, 1896, J. W. Adams came to the station as helper to Mr. Payne. He was employed thus during the summer of '96 and '97 while a student at Kansas Agricultural College, and again in 1899. Up to that time the station had been financed from the Hatch fund. Then a new ruling of

the Department of Agriculture left the station without financial support. Superintendent Payne was given employment in extension work. He traveled over all the plains area of Colorado, taking notes on what had been accomplished and passing on information to others.

Late in the fall of 1899 experimental work at Cheyenne Wells ceased, and for several years the farm was rented out, the only return to the state being the care of trees and buildings. J. B. Robertson, who had been the first superintendent, lived on the place most of this time and gave it very good care.

During the winter of 1908 and '09 the legislature appropriated \$2,000 to be used during the next two years for experimental work at the Cheyenne Wells station. The Board of Agriculture put it



Windmill tower and tank for domestic water supply on Cheyenne Wells Demonstration farm.

up to J. E. Payne to devise the best means of using this money in a way that it would not be wasted in case other funds should not be forthcoming. The station had no stock or machinery, so it was a problem how to use this money to advantage. Mr. Adams was living on

his ranch sixteen miles south of Cheyenne Wells at that time. Mr. Payne came to him and together they worked out a plan to get someone who had teams, cows and machinery to handle the place, rent free, so as to have most of the appropriation to put into buildings. No one was found, however, until February, 1910, when Mr. Adams was offered \$900 and the proceeds of the farm for one year if he would take charge. He accepted the proposition to begin March 1, 1910. He brought from the ranch a bunch of range heifers, which he proceeded to develop into milk cows.

That summer an adobe cow barn, hen house and store room were built. This was practically the first adobe work in that part of the plains. It was so satisfactory that in the fall of 1910 a bulletin was issued (No. 174) describing the work in detail. This bulletin was given wide circulation and many farmers followed the suggestions therein given for construction of farm buildings from sun-dried bricks. The buildings are still (in 1926) in good shape with slight deterioration. Other buildings have been constructed as funds were available.

After 1910 there were no funds available for this station except as the Board of Agriculture would supply some very pressing need, so Mr. Adams continued in charge of the station on about the same terms, minus the \$900.

In 1911 he procured a Holstein bull and two cows which formed the nucleus of a dairy herd. There were no silos in that part of the state and few people had the means to build of wood or concrete, so the station set the example of making pit silos.

The first two silos were built in 1912. These were so satisfactory that a bulletin was issued giving full details of construction. The method was adopted by large numbers of farmers and has been a great help to dairy men and feeders on the plains.

Two more silos were built the next year, and in 1923 four others were constructed. These eight silos furnish storage for crops to be fed out in seasons when the grass is poor or feed crops fail.

About 1914 Mr. Adams adopted a plan of contour farming on sloping ground, in which rows were laid off not with the compass but with the level. The rows were made to follow as nearly as possible the contour of the land. After two years' trial he found that the east field was too irregular to be practical to farm in this way, but he has continued until the present time on a portion of the other field. He has found this to be a most practical method of handling the soil where the lay of the land permits. On several occasions it has saved enough moisture to make a good crop when land handled in the ordinary way failed almost completely.

Few, if any, farmers have adopted this method. They seem to dislike to farm curved rows.

Conclusions given by Mr. Adams as a result of his work at Cheyenne Wells and from observation, are as follows: "Diversified farming is the most successful. A herd of milk cows with enough hogs and poultry to



Type of adobe farm storage house on Cheyenne Wells Dry Land Demonstration Farm.

utilize the by-products, and a garden in a favorable place, or under protection of a well, insures a living. Grain farming should be on the side rather than the main business. When grain fails it will usually make feed, which could not be utilized if the farmer did not have cows.

"Farmers should not undertake to farm more than they can do well. The majority of people over-estimate their ability to get work done and many times make a failure for that reason. The silo is a great help in conserving and storing feed.

"Great care should be taken to protect the land from blowing, as this not only ruins growing crops, but injures the soil. Sometimes this is accomplished by leaving stalks or stubble on the ground, sometimes by fall plowing or listing, leaving in the rough. Other times roughening the ground with cultivation is sufficient. The disk is a poor tool with which to control blowing. Small areas may be protected with manure.

“Early cultivation of ground in spring and late planting of feed crops especially the sorghums and millets, is advised. Do not allow the weeds to get moisture.

“Every farm should have some fruit and shade trees. A level location should be selected where some run-off water is available. Honey locust, ash, box elder and Russian olive seem to be trees best adapted to this locality. Cherries, plums, gooseberries and currants are among fruits that do well. If some irrigation water is available, strawberries and other berries may be raised. All shade and fruit trees must be kept free from weeds at all times, and unless irrigation water is supplied, no crops should be grown between tree rows.

“I strongly recommend the contour system for row crops, where the ground permits it. It has saved the day for me on several occasions.

“Where native pasture is scarce, it will pay to have some barley, sudan grass or sweet clover for pasture for cows. I have about 20 acres that I devote to this purpose, using it for night pasture for cows.”

CHAPTER VIII

History of Sugar Beet Production

Only eight years after the first gold seekers arrived and ten years before Colorado became a state, the idea was put forth that sugar beet culture and the manufacture of beet sugar were feasible. The thought bore fruit in action almost immediately and for nearly ten years there was agitation for establishment of the industry. Beets were grown experimentally for sugar, tests were made, the United States Department of Agriculture aided in determining the possibilities, capital was sought and seemed willing to invest in a factory, legislative aid was asked but refused, farmers became interested, fairs offered premiums for sugar beets. But this agitation and experimentation brought no results for thirty-three years, as the time was not ripe for launching such an ambitious manufacturing enterprise as the sugar industry has since become. Though there came a long period of comparative inactivity, the seed sown by far-sighted pioneers finally bore fruit, a prophecy made more than half a century ago has been fulfilled and Colorado has become the leading sugar producing state in the Union.

The succession of events that started the industry is easy to trace and the lesson of these events is only another proof of the foresight of the founders of the state, who seemed to have been gifted with rare vision to forecast the state's industrial future, though what they really possessed was the good common sense to note the agricultural possibilities, and the native intelligence to urge the development of obvious resources.

THE FIRST SUGGESTION.—Unquestionably it was an editorial in the Rocky Mountain News of Nov. 3, 1866, entitled "Beet Sugar," that set the idea in motion, and brought action on the part of Peter Magnes, a Platte Valley farmer and L. K. Perrin in the Clear Creek Valley, both of whom grew beets, followed by tests in Denver made by Prof. Jacob F. L. Schirmer, a metallurgist and chemist, which developed the suitability of climate and soil and the adaptability of irrigation farming to sugar beet production. This happened before Utah grew sugar beets, when California was just making a start and at a period when Colorado farmers were without aid from official scientific sources, for there was as yet no Agricultural College nor Experiment Station.

This is the editorial utterance that started the agitation:

"The past seasons have demonstrated that the soil of Colorado has no superior in the world for producing the sugar beet. It is a singular fact that there are no manufactories for making sugar from this vegetable, on this side of the Atlantic, notwithstanding the superior excellence of the product and great demand for it. We are of the opinion that its manufacture here would prove a good paying investment, besides saving to the country a large amount of capital that now goes east for the purchase of this staple."

Then followed a quotation from a French journal, *The Moniteur*, giving figures on the extent of the beet sugar industry in Europe.

BEETS MENTIONED IN 1841.—Long before the gold discoveries that resulted in the settlement of Colorado, sugar beets were thought of as a possible crop for the southern portion of the region. In the petition filed January 8, 1841, by Guadalupe Miranda and Carlos Beaubien, praying Governor Manuel Armijo of the Province of New Mexico for what in later years became known as the Maxwell Land Grant, one of the purposes mentioned for which the land was to be used was the growing of sugar beets. This is contained in the following translation from the original petition:*

In view of what has been made public, we ask that Your Excellency have the kindness to give us a piece of land, with the intention of improving it without damage to the third party, particularly for the purpose of cultivating the sugar beet, which we believe will grow well and abundantly, and with the intention of establishing manufactures of cotton and wool and of raising animals of all kinds.

ON THE MAXWELL GRANT.—The Maxwell Grant extended northward beyond the 37th parallel of latitude, into what later became Las Animas County, Colorado. While the grantees did not realize their expectations at the time, the incident has its significance in showing that agriculture was ever in the thought of the pioneers, although precious metals may have been their first object of search. The fact that Beaubien was a Frenchman may explain his familiarity with beet production, the sugar industry having made great progress in France in the decade previous to 1841. It is interesting to note that sugar beets are now grown on the southern portion of the Maxwell Grant in New Mexico.

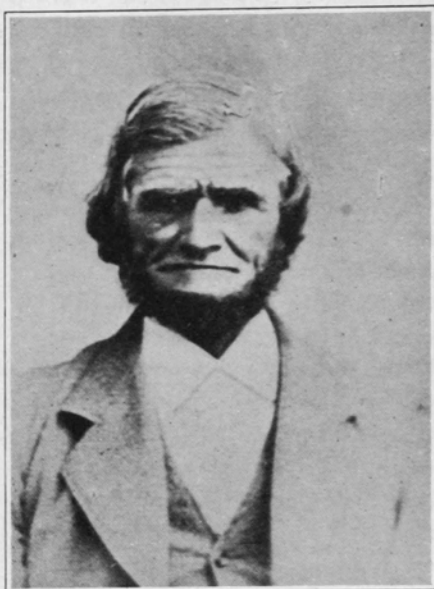
PETER MAGNES THE FIRST GROWER

The editorial previously quoted undoubtedly was written by William N. Byers, founder of *The Rocky Mountain News*, but inspired by contact

*The passage in the original reads as follows: " * * * Bajo la conviccion de todo lo espuesto Solicitamos ambos qe se sirua V. E. tener la bondad de donarnos un pedaso de tierra, con el proposito de beneficiarlo sin perjuicio de tercero, particularmte con el objeto de cultivar la betarrago pa asucar, qe jugamos se producira buena y en abundancia, y con el tpo establecer manufacturas de algodón y Lana, y crecer animales de toda clase * * *"—Twitchell's *Spanish Archives*, Vol. 1, pp. 63-65.

The historian is indebted to A. A. Edwards, President of the State Board of Agriculture, for the information concerning the purpose of Miranda and Beaubien to grow sugar beets on the Maxwell Grant.

with someone who had studied the industry. The first sentence in the editorial seems to indicate that beets had been grown in Colorado Territory not one year but "seasons." Who grew them? The evidence as first grower points to Peter Magnes, farmer of Swedish descent who came to Colorado from Ottawa, Illinois, and who, rightly, may be credited with being the father of sugar beet growing in Colorado. Sharing with him in no small way the honor in these early investigations was Prof. Jacob F. L. Schirmer, whose scientific knowledge was an essential accompaniment to the practical information developed by the good natured, shrewd and popular Peter Magnes, for several years a member of the Board of County Commissioners of Arapahoe County and a fifty-niner who quickly gave up the hunt for gold and started farming in the Platte bottoms, on what later became the Burton Seed Farms, about seven miles from the heart of Denver.



Peter Magnes, who began to grow sugar beets in the Platte Valley in the sixties and who advocated sugar making thirty years before the first factory was built in Colorado. (Photo furnished by Colorado Historical Society.)

BROUGHT SEEDS AND TREES.—It took Peter Magnes only one summer to see that for him fortune lay in agriculture, so he went back to Illinois in the fall of 1859 and returning to Denver June 30th, 1860, with his family, he brought fruit trees, currant bushes, grape vines and "seeds of all kinds for use on his farm seven miles above town on the Platte."*

Just when his first beet seed was planted is not definitely known, but subsequent events indicate that it was in the earlier years of his farming and prior to the publication of the editorial of Byers. It is possible, too, that L. K. Perrin grew beets before 1866, but there are no records to show that he was actively experimenting with them for sugar until after 1866. Beets grown by Perrin were tested by Prof. Schirmer, but Peter Magnes was not only growing beets, but preparing to make tests on his own account, as will be seen by a report made later by the Littleton Farmers' Club, based on Magnes' experiments. This report, like other documents of the time on

*Rocky Mountain News.

a subject about which little was known, contains statements that seem ludicrous in the light of the present day; nevertheless it bears the stamp of genuineness, of earnestness and honor of the men who made it and left it for posterity to scan and measure the distance that agriculture has had to travel since that early day in a new and untried land, where men dealt almost blindly with the forces of nature.

LABORATORY TEST IN '69.—The editorial of 1866, based on previous trials with beets, brought its first tangible results in 1869 with science entering the field in the person of Prof. Schirmer. As Peter Magnes on one hand typified the practical tiller of the soil, so Schirmer on the other, brought technical training to bear on the problem. Freiberg was his Alma Mater and like many other men of rare training, it was Colorado's wonderful mineral possibilities that brought Schirmer to the mountain country as a metallurgist and assayer. He conducted an assay office and we find him active with others of the brilliant company of pioneer men of science, instinctively feeling out the possibilities in lines other than mineral and turning their training to account for the people. As Peter Magnes in his way, a high type of rural citizen, became a force in the political life of the community, as commissioner of a county that then extended the full distance from the foothills to the line of Kansas Territory, so Prof. Schirmer became a political leader and received his temporary reward in appointment as superintendent of the United States Mint. William N. Byers, the Editor, knew them both, for each was, in his own sphere of action, a source of news for the editor. Byers also was the connecting link between L. K. Perrin, the careful farmer and pioneer fruit raiser of the Clear Creek Valley, and Schirmer.

PROF. SCHIRMER'S PROPHECY.—The next step in development is recorded December 8, 1869, in a letter to *The Rocky Mountain News*, signed by Prof. Schirmer, bearing the title: "Culture of Sugar Beets—Manufacture of Sugar, Alcohol and Potash in Colorado." It is the closing paragraph of this letter that carries a prophecy that has practically come true. These are Schirmer's words:

"In conclusion I will say that our climate and soil is well adapted for the culture of the beet, and that it is my honest belief that no other country on the face of the globe has equal advantages, if a proper system of irrigation is inaugurated. The construction of ditches is only a small item as compared with the costly levees of Louisiana. Our coal is equally as good, and perhaps better, for evaporating purposes than bituminous coal or anthracite. In short, there is nothing to hinder it to make Colorado the greatest sugar producing state in the world."

That Colorado has reached the distinction of leading the states of the Union in beet sugar production is ample fulfillment.



Professor Jacob F. L. Schirmer, who made the first laboratory tests of sugar beets in Colorado. These tests were made in the old United States Mint building, Denver, in 1869.

Other parts of the Schirmer report are equally interesting though they indicate lack of knowledge of details of sugar making and a tendency to over-estimate productive capacity of the soil, faults which are easily overlooked when one considers that these things were written before the industry was established anywhere in America. We are not unmindful of the fact that the Mormon pioneers of Utah had talked sugar beet production in the early fifties and that in 1853 machinery for a complete sugar mill was shipped from England to Provo, but this mill never was used.

Prof. Schirmer's report of December 8, 1869, begins with this statement: "The area of the fertile soil in Colorado for the culture of sugar beets is of vast breadth, extending for hundreds of miles

north and south of Denver, large enough to furnish all the sugar to supply the whole nation, and thousands of hogsheads besides for exportation."

DESCRIBES BEET TERRITORY.—The statement as to range of territory that may grow beets has been borne out, for the sugar area includes the valleys of the Platte, Cache la Poudre, Big Thompson and St. Vrain in Northern Colorado, the Fountain Valley and the Arkansas in central and southern Colorado, the Colorado and lower Gunnison and Uncompahgre, and lately also the San Luis Park region, certainly an area well described as extending "hundreds of miles," though it falls far short of producing sugar for the nation.

"That its production," continued the report, "will be cheaper than from cane I will show in the sequel. Some of our farmers are already complaining that they are producing more than can be consumed by our population, and the freight and expense of shipping their wheat and other cereals to the nearest market will allow no competition with other western states.

But how different will it be with a staple article such as sugar, with cheap fuel at hand from our inexhaustible coal banks."

The report then tells of consultation by Prof. Schirmer with Dr. G. W. Hulse, a former Louisiana sugar planter, who had also visited Europe and investigated the beet sugar factories which were turning out alcohol and potash as by-products. Experiments conducted by Dr. Hulse with 112 pounds of beet juice furnished by L. K. Perrin, yielded over 25 pounds of rich heavy syrup, though these beets were not the true sugar beets. No crystals were obtained in the Hulse tests, "as no lime was used to neutralize the acid."

TONNAGE FIGURES EXAGGERATED.—Prof. Schirmer then proceeds:

From prominent farmers I learn that an acre of our soil will produce 30 tons of sugar beets (some estimate it at 50 tons). 160 acres therefore will produce 4,800 tons of beets, from which 384 tons of white sugar can be obtained, equally as good as from cane, and 1,200 tons of pulp for fodder. This amount of sugar is calculated to be only 8 per cent of the beet, while in Germany 9 3-5 per cent are obtained. These 384 tons of sugar at 15 cents per pound amount to \$115,200. With 1,200 tons of pulp 350 oxen can be fed for four months, which will increase their value \$25 each, or \$8,750 for all, which will render a gross production of \$123,950, besides a large quantity of manure. The proceeds from the molasses could still be higher if potash and alcohol would be manufactured from it, as is done in France, and this requires no expensive apparatus or machinery. But we will now consider the receipts \$123,950 from the 160 acres and find the expenses we will have in the production.

Two seed machines at \$100.....	\$ 200.00
Twenty cultivators at \$10.....	200.00
Two thousand pounds of seed.....	700.00
Machinery to work up from 2 to 2½ tons of beets per day.....	10,000.00
Factory building (wooden).....	5,000.00
Building for superintendent and bookkeeper.....	4,000.00
Incidental expenses.....	1,000.00
Total.....	\$21,100.00

WORKING EXPENSES

Sixty workmen during winter at \$2 per day (Chinamen could be got at \$1); that is, thirty by day and thirty by night, makes \$120 per twenty-four hours, during 150 working days.....	\$18,000.00
Fuel (coal).....	1,000.00
Light.....	500.00
Salary for superintendent.....	1,800.00
Bookkeeper.....	1,500.00
Wear and tear of press cloth.....	250.00
Wear and tear of buildings 5% and machinery 10%.....	190.00
Insurance.....	200.00
Incidental expenses.....	1,000.00
	<hr/>
	\$24,440.00

Deduct the \$24,440 from \$123,950 leaves a net production of \$99,510 from 160 acres.

SUGGESTS CO-OPERATIVE GROWING.—These staggering figures were accepted as a matter of course, Prof. Schirmer suggesting co-operative growing of beets, and outlining an organization of ten farmers in a group, each

owning 80 acres of beet land. Each farmer was to plant beets on the same ground only once in five years, that is 160 acres of beets each season, 16 acres per farm, to get the results indicated in the tabulation. These ten farmers were to subscribe \$25,000 in shares, giving their lands as security. As they were to cultivate only one-fifth of their acreage to beets yearly, it would leave them ample acreage for crops "for support of their families." Thus the good Professor of Metallurgy indicated familiarity with the principles of co-operative production, though his figures on yield and extraction of sugar were, to say the least, extraordinary.

FIRST TESTS MADE IN U. S. MINT

The tests of L. K. Perrin's beets were made by Schirmer in the old United States Mint building that stood at Fifteenth and Market Streets, Denver, with such apparatus as an assayer might possess and in an atmosphere suggestive of gold rather than agriculture. Even men of science, once they become accustomed to weighing "dust" or roasting high values out of gold-bearing rock, may be pardoned for errors in figuring extraction values in the lowly beet.

Naturally the next step was to "cash in" on the project and build a factory. While that was not the culmination at the time, failure was not due to lack of effort. The pioneers were in the habit of seeing things through and the sugar question was no exception to the rule, so when an opportunity arose a year later to acquire a sugar mill, it was investigated.

A SUGAR MILL OFFERED.—It was at the time of the location of the Chicago-Colorado Colony that founded the town of Longmont, that the next event occurred in sugar beet history. A member of the locating committee, H. D. Emery by name, and hailing from Chicago, brought to the attention of Denver business men the fact that the sugar factory equipment at Chatsworth, Illinois, was on the market. Emery had in mind the possibility of locating this plant at Burlington, later called Longmont, but explained that the colonists were producers rather than manufacturers and that capital was needed to buy and move the factory from Chatsworth. In the light of later developments at Longmont, now the center of the experimental work of the Great Western Sugar Company, the largest operating company in beets in the world, one is led to marvel at the intentions of Emery, who was one of the editors of *The Prairie Farmer at Chicago*, and, who without knowledge of beet growing possibilities in what was then the wilderness of northeast Boulder County, entertained an idea that came to fruition many years later in the spot that appealed to Emery's imagination.

DENVER MEN INTERESTED.—A meeting of Denver citizens was called by Emery for March 8, 1871, in the office of O. A. Whittemore, Clerk of

the District Court, "for the purpose of taking into consideration the question of erecting beet sugar works in the territory of Colorado." Twenty citizens assembled and Judge H. G. Bond was made chairman, with Mr. Ruter secretary. Emery read a letter from "a gentleman in Chicago" stating that the Chatsworth, Illinois, sugar works could be had for between \$40,000 and \$50,000, and he suggested that \$50,000 be added to the cost of the plant to erect buildings and start the industry. There was considerable discussion, principally favorable, Mr. H. B. Bearce declaring that "in ten years Colorado would be the great point in the United States for the production of sugar beets and the manufacture of sugar, as the soil and climate were just suited to their growth."

The upshot was the appointment of a committee to solicit funds to finance the proposition, this committee comprising: Prof. Schirmer, H. G. Bond, John Pierce, William N. Byers, J. W. Smith, George T. Clark and H. B. Bearce.

Nothing came of this effort, although public discussion continued. It was brought out that the Chatsworth, Illinois, project failed after several years of trial and the expenditure of nearly half a million dollars, because the soil and climatic conditions in Illinois were unfavorable to beet culture. The claim was made that Colorado tests had shown results superior to those in California, "where the average is only 15 tons to the acre"—quoting a newspaper account of February 19, 1871. "Two small fields cultivated near Denver last year gave over 150 tons to the acre. One of them, by actual measurement and weight, yielded 174 tons per acre and the other was thought to be fully as large."

MAGNES SENDS FOR A MILL.—What sort of beets these were is left to conjecture. That something was wrong with the estimates is obvious, but that beets were grown that yielded well in sugar admits of no doubt as the sequel will show. The announcement that followed was: "Mr. Magnes of this county has sent east for castings for a small mill and press and will soon be able to test satisfactorily the question of sugar manufacture from this course. There are already two large manufactories in California."

The last statement was corrected a few days later in a communication that bore the signature of M. W. Levy, address Melvin House, Denver. Levy had just come from California where he "lived near the Alvarado Sugar House, in Alameda County." He said there were originally two beet sugar mills, but that the Pioneer Sugar House, organized at Sacramento two years ago (indicating 1869), was abandoned because of mismanagement after an expenditure of \$15,000. This left in operation the Alvarado plant, which, he declared, had been built at a cost of \$130,000

in gold. "It has a capacity of 30 tons per day," continues Levy's communication, "the yield of the beet is 8 per cent of sugar."

ALVARADO FIRST IN UNITED STATES

The Alvarado plant was the first successful beet sugar factory in the United States, beginning operations in 1870. It has been in continuous operation since with the exception of 1914, the shutdown being due to adverse tariff legislation, and 1925, when leaf hoppers cut the yield in the district so that the tonnage was handled in another factory. In the early years beets were grown without irrigation in that district, the average yield being about 12 tons per acre on the 900 acres which supplied the plant up to 1889.

That beet culture was a common subject for discussion at that period is again evident in scanning a set of answers to questions, sent out by the organizers of the Union Colony at Greeley, to prospective settlers, during the spring of 1871. This statement appears in that document:

"The country is admirably adapted to the culture of the sugar beet. The crop is wonderfully large and very rich in saccharine properties."

In the meantime Prof. Schirmer and Peter Magnes had been busy, the latter, as stated, sending east for a small mill, while Schirmer had decided to get a real test of beets grown by Magnes, by sending a sample to the Department of Agriculture at Washington. Prof. Schirmer enlisted the aid of Honorable Jerome K. Chaffee, the territorial representative in the United States Senate. The result of that effort is so well told in Schirmer's own report on the tests, quoting the letters that he received from officials at Washington, that it should stand as historical fact, marking the first official test in the establishment of the industry, though results were long delayed. Beets grown in 1871 by Magnes and harvested in October, were sent by express to Washington. The returns from the test came in two months and the report prepared by Schirmer for the press, under date of December 1, 1871, tells the story as follows:

REPORT ON WASHINGTON TESTS

On the 16th of October, Mr. Peter Magnes brought to me a box containing sugar beets that had been raised on his farm, seven miles from Denver, with the request that I would make an analysis of them. Not being provided with the necessary apparatus and chemicals for such a test, I forwarded them to the agricultural department at Washington with the request that they would analyze and send the result to me. I also wrote to Hon. J. B. Chaffee at the same time asking that he give the matter his personal attention. He, recognizing the importance of the subject to Colorado, promptly used his influence and has again placed the people of the territory under obligations by having a careful and complete analysis made and forwarded.

The beets were raised on bottom land that had been cultivated for a number of years and the estimated yield by Mr. Magnes, incredible as it may seem, was over 100 tons per acre. However, I have no reason to doubt the accuracy of this estimate.

An impression has prevailed that trouble is experienced in crystalizing the sugar made from sugar beets. Now this is entirely and emphatically erroneous. The finest loaf sugar, such as we all confiscated from our mothers' cupboard when boys, was manufactured from the sugar beet.

Some \$95,000,000 is sent out of the United States annually for imported sugar. If the great agricultural resources of Colorado were devoted to the culture of sugar beets and the manufacture of sugar therefrom, this would not be the case and trains of cars would no longer go East empty. On the contrary, they would be literally loaded down with Colorado beet sugar, thereby adding not only to the wealth of Colorado, but to that of the whole country. I earnestly request that you through your paper, by its great influence and large circulation, agitate the question, induce our farmers to plant the seed for a crop next year and our capitalists to erect a manufactory for its utilization. Could not our legislature about to assemble, do something to encourage this subject, of so much vital importance to the present and future of our territory?

JACOB F. L. SCHIRMER.

Schirmer wrote as follows to the Honorable Fred Watts, Commissioner of Agriculture:

United States Branch Mint, Denver, October 18, 1871:

Sir: I have this day forwarded to your address by express one box containing sugar beets raised from French seed. Their yield in this territory is enormous, but their value as sugar producing beets is not yet settled, and as there is no way here of testing their value for that purpose, will you favor this entire community by causing a regular analysis of the beets to be made, showing quantity of saccharine matter and alkaline content?

Mr. Capron, your predecessor, manifested a great interest in this matter, sending some of our farmers choice seeds. Hoping this will be sufficient excuse for asking your assistance in carrying out at the earliest practical moment the experiments inaugurated, I have the honor to be

Very respectfully yours,
JACOB F. L. SCHIRMER.

The report of the Acting Chemist of the Department of Agriculture on the tests follows:

Department of Agriculture, Laboratory, Washington, D. C.
November 7, 1871.

Hon. James W. Swank, Acting Commissioner,

Sir: I have the honor to report the result of an examination of sugar beets sent from Denver, Colorado, for purpose of determining the sugar.

Two of the beets were *operated upon. Their dimensions were:

1. 18 inches long; $5\frac{1}{2}$ and $4\frac{1}{2}$ inches diameter; weight, 6 lbs.; $12\frac{1}{2}$ ounces.
2. 16 inches long; $4\frac{1}{2}$ and $3\frac{1}{2}$ inches diameter; weight, 4 lbs.; $\frac{1}{2}$ ounce.

The percentage of sugar was absolutely the same in both. Several experiments gave 14.50 percent. The analysis was made in each instance by the optical method.

The average percentages obtained in Europe are here stated for the purposes of comparison, it being remembered that they are practical results obtained in factories, while figures obtained in exact analysis indicate absolutely all the sugar contained. Average polarization (determination) in Einbeck factory working by the diffusion process 11.42 percent. Average of several hundred polarizations at the Broilsted factory by hydraulic pressure, 11.09 percent. In the same factory another season 12.05 percent.

The highest figure which I remember to have seen recorded in European experiments is 14.78 percent.

From the foregoing it would appear that Colorado is capable of raising very excellent beets containing high percentage of sugar. The specimens sent were of very large size, white with green collar, firm texture, slight "pith," and contained when examined 85 percent of water. The variety seemed to be the white Magdeburg or possibly Vilmorinus' improved Imperial. No determination of the alkalis was made,

*The use of the term "operation" is explained by the fact that the Acting Chemist who "performed" these tests was an M.D.

because it was deemed unnecessary. Exact experiments have proved that the physical condition of the soil on which beets are grown, is far more important than the chemical constitution. Good barley soils are good beet soils also, but beets have been successfully raised on heavy soils as well as light. In the latter case, particular attention must be paid to subsoiling, so as to assure thorough aeration of the soil and ready drainage. It may be stated that as a rule, beets thrive best upon a light sandy loam, while their cultivation on such land involves less expense.

W. C. TILDEN, M.D., Acting Chemist.

BOUNTY BILL IS INTRODUCED.—Publication of this report was followed by introduction of a bounty bill in the Territorial Legislature in 1872, the first section of which read as follows:

“The first corporation, company, person or persons who shall within the limits of this territory erect a manufactory and refinery for the purpose of manufacturing sugar from beets at a cost of not less than \$50,000 and with a capacity of producing two thousand pounds of sugar per day, and shall manufacture from beets grown within the limits of this territory at least 200 barrels of good, merchantable sugar, shall be paid from the treasury of this territory the sum of \$10,000.”

The defeat of the measure was attributed to the argument that sugar made from beets was not equal to cane sugar and that the process of manufacture had not been satisfactorily developed. Perhaps the fact that the territorial treasury was nearly empty also had something to do with the fate of the measure, the passage of which was urged by a group of farmers and business men who were earnestly striving for the establishment of the industry.

FIRST PROMOTION COMPANY FORMED.—These men decided to form a company for the purpose of building a factory, and at a meeting held February 23, 1872, organized the Colorado Beet Sugar Manufacturing Company and started a subscription list for stock, which, at the close of the meeting had been taken to the amount of over \$30,000. James Archer called the meeting to order. Professor J. F. L. Schirmer was made president and Fred J. Stanton secretary. Archer's statement that the industry would bring “more than a million dollars a year” was certainly not overdrawn in the light of the fact that the annual payment to farmers fifty years later is more than twenty million. The incorporators of this, the first sugar beet promotion company, were : Fred Z. Solomon, J. E. Bates, H. P. Bennett, M. N. Everitt, E. F. Hallack, W. G. Sprague, George C. Schleier, Phil Trounstine, James Archer, Charles W. Perry, L. K. Perrin, H. G. Bond, Henry Crow, Jacob F. L. Schirmer and Peter Magnes.

In order to stimulate growing of beets, several of those interested in the promotion offered prizes to be given at the next fair of the Colorado Agricultural Society, these including J. D. Perry, \$50, and George Schleier, \$10, to the farmer growing the best acre of beets; by Phil Trounstine, a suit of clothes worth \$30 for the second best acre; by Colonel Archer, \$25

for the third best acre; by W. G. Sprague, \$10 for the fourth best acre; by E. F. Hallack, \$25 for the best five acres, and by F. Z. Salomon, \$10 for the largest beet. The inference is that the "best acre" prizes were intended for the heaviest yields. These classifications were included in the next premium list; in fact, they remained in force several years thereafter, sugar beets becoming a regular division of the crop exhibits at the Colorado Agricultural Society's fairs.

FARMERS' CLUB REPORT.—Five years passed without accomplishment, during which sugar beets were becoming a recognized forage and root crop by dairy farmers, but sugar production still was remote. The subject was revived in 1876, when the Rocky Mountain News, in an industrial and agricultural supplement, again urged a bounty on sugar and published a report made by Peter Magnes and two other farmers to the Farmers' Club of Littleton. In this report we find over-estimates in tonnage and exaggerations in extraction figures that now seem ludicrous, but it was an honest report, though blundering in some respects, just as the reports of Professor Schirmer blundered. Under the heading of "Beet Culture and Beet Sugar," we read:

This subject has heretofore and is now receiving attention throughout the Territory. Nature seems to have unmistakably provided for us a soil composed of chloride of sodium, chloride of magnesia, chloride of potassium, which, it is claimed, are necessary to produce the growth and the increase in saccharine matter. The climate being eminently favorable to the cultivation of the sugar beet, nothing more is wanting but the capital to make the manufacturing of beet sugar one of the great industries of Colorado. To secure the establishment of such works without unnecessary delay, the people are, or will soon be, asking the Legislature now in session to offer a bounty of \$10,000 to the first party who will manufacture from beets grown in Colorado one hundred barrels of beet sugar. The propriety of granting its fostering aid is amply sustained by precedent, and the history of some of the states affords the best evidence of the happy effects of state bounties to schemes for the development of its natural resources. One of the most prominent is the action of the State of Michigan, in encouraging by bounty its salt interests. Under its fostering care, the works at Saginaw, in a short time, became formidable rivals to the famous Onondaga salt works in the markets of the country, and thus the state not only saved the thousands of dollars it had previously sent abroad for salt, but in turn, received thousands from other states; and to this time has continued to reap the reward of judicious and timely legislation. We presume the sentiment of a large majority of the people of Colorado is that \$10,000 cannot be turned to a better account than in aid of a scheme so full of promise for the future of Colorado. The beets grown in Colorado yield 14 7-8 percent sugar, or 290 pounds per ton, and are richer in saccharine matter than the average elsewhere. Our beets have been tested in the sugar mills in California and at Washington, and the result is that one ton of Colorado beets yield 290 pounds of sugar. For the yield of beets we refer to Peter Magnes, W. A. Powers and John McBroom, whose report on this interesting subject we present herewith; the report having long since been made to the Farmers Club of Littleton:

"Your committee on the sugar beet question beg leave to report that the bill before the legislature, appropriating \$10,000 as a premium for the first 200 barrels of sugar manufactured in the Territory, was defeated in the Council by one vote, and I fear another year will pass before a manufactory will be established in Colorado, which will be a great loss to every farmer and individual in the Territory, for the following reasons, illustrating my own case: I use in my family annually, about four barrels of sugar, which costs me about \$160; now if there was a beet sugar

manufactory in the Territory, I could raise the beets from which to make the sugar. According to government analysis of November, 1871, a ton of beets gives 290 pounds of sugar. A ton of beets costs me about \$10, therefore for \$40 I could raise beets enough to supply my family with sugar for a year. The difference between native and foreign sugar is my yearly loss of \$120. The same statement will apply to thousands of farmers. I can safely say that I can average seventy-five tons of beets to the acre. I have raised at the rate of 132 per acre. I had an enormous yield in 1871, but did not weigh the crop.

"The beets stand the dry weather with less irrigation than any other crop, only requiring light cultivation to keep the ground from forming a crust on top. The rows were twenty inches apart, but should be two feet; used Comstock's garden drill and cultivator combined. I have made a slight improvement with this. The seed is distributed more evenly. I use a cultivator between the rows at different times. At the first weeding, I thinned out to the proper distance, about eight inches apart, or between each plant.

"The roots were grown and matured by the last of August. The proper time to sow the seed is from the 15th of April to the 1st of May, about ten pounds to the acre.

"I will show you by figures why I am so deeply interested in the sugar beet question. If one ton of beets yields 290 pounds of sugar and one acre 75 tons of beets, average yield, it would give 21,750 pounds of sugar, at 15 cents a pound, making a gross sum of \$3,262.50. The cost of raising the beets on one acre and drawing them, at \$16 per ton makes \$750 for labor, leaving a net profit from one acre of ground of \$2,512.50. Furthermore, the beets contain 15 percent of dry pulp, which is excellent food for milch cows, valued at \$10 per ton, which will make from one acre, 11 tons and 250 pounds, and the value, at one-half cent per pound, makes \$111.25, or a total value from one acre of \$2,625. These figures show very large, but they are an actual account of the assay office; but if we can get one-half, or even one fourth of these figures, it will give a larger profit than any other crop we have raised.

"I look upon the sugar beet question as of great national wealth to the whole Union and our own territory in particular, and I could but feel when the Council defeated the bill that millions of dollars were lost to us.

"If we had beet sugar factories in Colorado similar to the flour mills scattered around, so that the farmers could raise beets and draw them to the mill and get them manufactured the same as we now get grain manufactured into flour and meal, I imagine Colorado farmers would produce more gold than all the mines in the mountains. Professor Hulse stopped at my house four weeks in 1870 and experimented on sugar beets. He thought they were extremely rich in sugar, of large size and nice growth. In his opinion, Colorado will excel Louisiana for making sugar, as it possesses a dry air favorable for crystalizing sugar, also pure air and an abundance of fuel, and these are important items in the manufacture of sugar from beets."

(Signed) PETER MAGNES.

And approved by other members of Committee—W. A. Powers and John McBroom.

When Magnes says these figures are "an actual account of the assay office" he is not far wrong, for Professor Schirmer, as has been mentioned, made his first tests in the laboratory at the United States Mint. It was the old idea of hauling wheat to the mill and taking back the grist, minus the miller's toll, that Magnes had in mind when he speaks of methods of marketing sugar beets.

A PERSISTENT BOOSTER.—The impression left by Peter Magnes' persistence in pursuit of information on the manufacture of sugar is one of unselfish public good. He was not seeking personal gain. An anecdote related by Albert B. Sanford, Curator of the State Historical Society, who, during his own boyhood knew Magnes well, illustrates the character of the pioneer investigator. Among the early day farmers was John McBroom,

whose signature appears on the Magnes sugar beet report, already quoted.

"John McBroom was my uncle," said Sanford, "and he had built a nice farm home over on Bear Creek near what is now Fort Logan. One night it burned to the ground. Nothing was saved but the lives of the family. The next morning the neighbors gathered to see the ruins and offer condolences. They did not come empty-handed. In their wagon-boxes they brought bedding, food, a stove and other household furnishings and utensils to give my uncle's family a new start. It was a way the pioneers had of helping each other, when one was in distress.

"Uncle Peter, as we all called Mr. Magnes, was one of John McBroom's good friends and neighbors, but he was not on hand, for some reason or other, and I know some of us wondered why he hadn't shown up. Finally he came and we all looked over toward his team to see what he had brought. Strange to say, there was nothing in the wagon-box. He got down off the seat and walked over to the group that stood around the blackened ruins of the house. He poked the ashes with his stick, stepping around here and there, to see what damage the fire had done. Finally he walked up to my Uncle John McBroom and said:

"'Vell, John, you have some hard luck, didn't you?'"

"'Yes, lost everything, Uncle Peter.'"

"'Vell, dat's too bad, too bad,' he said, in a brogue that showed his Swedish origin.

"'Yes, Uncle Peter, it is too bad.'"

"'Vell, vell, huh!' he mumbled, and then humping over as if it were an effort, Uncle Peter reached down into his trousers' pocket and pulling out a roll of greenbacks big enough to choke an ox, he handed the money to my uncle and said:

"'Here, John, you take dis, you vill need heem.'"

That is the sort of man Peter Magnes was.

AGRICULTURAL COLLEGE BECOMES ACTIVE

Agitation was continued intermittently through the farm press, commercial clubs and by the State Agricultural College, which from its establishment in 1879, conducted tests with various crops at Fort Collins. These tests gave place in 1888 to research work by the Colorado Agricultural Experiment Station established in that year in connection with the college.

Field and Farm, a weekly, published at Denver, assumed leadership in propaganda which heretofore had been carried on by the newspapers. On April 25, 1888, Field and Farm announced that a quantity of beet seed procured from the Spreckles factory in California had been distributed to farmers near Denver. The beets grown that year in the Platte and Clear

Creek valleys were sent to a factory at Watsonville, California, for test, report of which came in March, 1889, to the effect that the sugar content was $16\frac{1}{4}$ per cent, which was said to be better than that of beets grown in California, or in western Kansas, and a trifle better than for beets grown in the Arkansas Valley of Colorado.



A healthy growing crop of sugar beets in midsummer.

BULLETIN No. 7.—It was about the same time that the first results were announced by the State Agricultural College in Bulletin No. 7, with samples of four varieties procured from the Department of Agriculture at Washington.

These were planted April 15, 1888, on one-fourth of an acre in the college garden. The planting was in rows three feet apart, the seeds being sown with a drill. The soil was a clay loam which had been in clover sod for three years previous, and was broken in the fall of 1887. Four irrigations were given. The yields per ton and pounds of sugar per ton on the four varieties were as follows: Excelsior, 29.04 tons, 190 pounds sugar; Lane's Imperial, 30.45 tons, 240 pounds sugar; Vilmorin, 25.09 tons, 227 pounds sugar; Imperial Improved, 24.15 tons, 176 pounds sugar.

The conclusion given in the bulletin was: "From the above it will be seen that there is quite a wide variation in sugar content in the four varieties tried last season. Enough, however, has been developed to create a lively interest in the cultivation of the sugar beet in this state for purposes of sugar production. The serious drawback seems to be the cost of the dif-

fusion plant, as quite a large amount of capital is required to prepare a suitable plant and furnish adequate machinery."

The next publication by the Agricultural Experiment Station on sugar beets was Bulletin No. 11, dated April, 1890. This reviewed experiments made at Medicine Lodge, Kansas, gave some information on the chemistry of beets, mentioned their feeding value, but contained nothing new developed at the Colorado Station.

OTHER BULLETINS FOLLOW.—Bulletin No. 14 followed, this being a progress report issued January, 1891, David O' Brine, chemist, being the author. Professor O'Brine and Dr. C. L. Ingersoll, president of the college and director of the station, visited the beet sugar factory at Grand Island, Nebraska. Bulletin No. 14 gives information developed by this visit. It is stated that the Grand Island plant cost about \$500,000 and that 200 men are employed, the factory running a night and day shift. This bulletin also gave details regarding tests made at Fort Collins on beets grown on the college farm and by co-operating farmers in various parts of the state.

Beets had been grown experimentally at the branch experiment station at Del Norte, in the San Luis Valley, and at the Arkansas Valley Station at Rocky Ford. Samples were sent to Fort Collins for testing by H. H. Griffin, superintendent of the San Luis Station, and Frank L. Watrous of the Arkansas Valley Station. These men were graduates of the Colorado Agricultural College who, upon finishing their studies, put their training to immediate use in aiding to lay the foundation for a great industry. Factories were established later in both of these regions, though the San Luis Valley plant at Monte Vista was dismantled in a few years, as it was not a commercial success. However, it was demonstrated at the time that beets could be successfully produced under San Luis Valley conditions, and only in the last few years the matter has again been taken up with the prospect of re-establishing a factory in that section.

FARMERS SEND IN BEETS.—Among farmers who sent beets to Fort Collins for testing and on which reports were given in Bulletin 14, were A. R. Black, Lamar; J. Silver, G. Lee, Perkins, Snyder, Probst and Zetzell, all of Sterling; Charles Green and A. S. Halsted of Del Norte, and Charles Schielman of La Junta. There were a dozen varieties also from the Agricultural College garden included in this report.

The results were said to be confirmatory of those of "last year," 73 analyses having been made. The yield per acre on the college garden was: Excelsior, 29 tons; Vilmorin, 27 tons; Imperial, 22.5 tons.

The bulletin goes on to state: "It has been estimated that the percent of sugar in Germany last year averaged 12.55 per cent and the average yield, according to Mr. Licht, was fourteen tons per acre. In this respect

Colorado compares favorably, as the average of those raised by the Horticultural Section was over 15 per cent, and the yield per acre over 26 tons. The cost of land in Germany being ten times what it is in Colorado gives our state another advantage. With the proposed bill, recently introduced in the legislature, giving a bounty on sugar made from sugar beets of one cent a pound, it must be an inducement to the manufacturer to invest his money in our midst, provided it becomes a law."

ARKANSAS VALLEY TESTS.—Sugar beets again furnished a subject for discussion in Bulletin No. 21, Frank L. Watrous being the author of a chapter reviewing the tests made in the Arkansas Valley. This bulletin was issued October, 1892. The first sugar beets were grown in the Arkansas Valley for testing purposes in 1890. Most of the work was done by the station, though Mr. Watrous reported that two or three enterprising farmers aided in the investigation. He said further: "The farmers of this section, having already felt the consequences of soil deterioration, through the successive cropping of wheat on the same land, began to see an advantage, providing a market could be secured, in growing a crop not particularly difficult to cultivate, not too tender to be handled by ordinary labor, less deteriorating to the soil than wheat, and less liable than most other crops to suffer from the exigencies of climate or the depredations of insect enemies."

The bulletin went on to state that the beets raised each year on the station had been sold to farmers and used as feed for cattle, sheep and hogs. "In each instance good results have been reported."

SUGAR CONTENT HIGH.—Comment by Field and Farm on these tests at Fort Collins appeared in the issue of February 27, 1892, as follows: "The success attained at Fort Collins in sugar beet culture last year has never been equalled in the United States. The average percent of saccharine in the United States is 13.62 and the coefficient of purity is 77. The Department of Agriculture is getting out a new sugar beet bulletin, in which Larimer County is put ahead of the world. One analysis shows 16.44 per cent of saccharine, coefficient of purity 90.2."

A SUGAR BEET CONVENTION.—Agitation was continued for the establishment of factories, a state sugar beet convention being held at Denver the week of March 26, 1892. Col. A. C. Fisk, chairman of the convention, was active in the distribution of beet seed among farmers in the Platte Valley. At this convention county organization was advised for encouragement of beet raising. Manager C. H. Jennings of the Lehi, Utah, factory, was among the speakers, as was Peter Magnes, who had been active for over thirty years along this line. A similar meeting was held at Fort Col-

lins for discussion of methods of interesting capital in the building of a factory.

FEDERAL BOUNTY LAW.—A Federal bounty law was in effect during these years, which stimulated promotion in a dozen widely separated localities over the United States. A similar law was introduced in the Colorado legislature during the early nineties and passed finally in 1895, only to be vetoed by Governor McIntyre on constitutional grounds.

SUPPLY FORTY FACTORIES.—In January, 1898, *Field and Farm*, in reviewing the sugar beet outlook, said: "While sugar beets have been grown in Colorado since 1860, the experiments during the last five years show that Colorado farmers could within two years supply at least forty factories in different localities. * * * Forty factories would require three thousand acres each, or 120,000 acres of land. Each factory should have a capacity of 300 tons a day for 100 days in the year. These 120,000 acres of land would mean 1,440,000 tons of beets, or a minimum of twelve tons to the acre. At \$4.50 a ton this would result in \$6,480,000 more to the farmers of the state annually. * * * During 1897 some very satisfactory returns resulted from the experiments which were undertaken in various parts of the state. In Garfield County W. C. Smith received an assay of 17.31 per cent of saccharine content, running 86 in coefficient of purity. In Pueblo County C. K. McHarg obtained a yield of 23 tons to the acre. In Conejos County John Milne grew 32 tons to the acre, the beets containing 84.3 per cent of purity and running as high as 17.2 in sugar. In Logan County G. W. Barrett had a little over 30 tons to the acre, while the average in Nebraska is about 11 tons. H. C. Hatch had 21 tons of beets and over 30 tons of tops."

KICK ON BEET PRICE.—Some farmers were dissatisfied with the offer made by promoters, ex-Governor Eaton of Weld County declaring that if the manufacturer would pay \$8 a ton for sugar beets instead of \$4, it might stimulate the enterprise and be a fair division of the profits between the farmer and the manufacturer. The governor said that potatoes at 50 cents a hundred were a better crop for the producer than beets at \$4 a ton. (*Field and Farm*, February 12, 1898.)

RESUMÉ OF EXPERIMENTAL WORK

The extent of the experimental work done by Colorado Agricultural College and the State Experiment Station during the ten years preceding and for several years following establishment of the first factories, was brought out in Bulletin 63, April, 1901, written by Dr. William P. Headen. Not only were tests made at the experiment stations in Rocky Ford and Del Norte, as has been stated, but farmers in all parts of the state

co-operated with the station in making growing tests. In 1897 the station received 500 pounds of beet seed from the Department of Agriculture at Washington and 200 pounds directly from Germany. This seed was sent to 611 farmers in 47 counties in five regions, namely, the Valley of the South Platte and its tributaries; the Arkansas Divide south of Denver for trials without irrigation; the Grand Valley on the Western Slope, the Arkansas Valley, and the San Luis Valley. Most of the tests for sugar from the harvest of this seed were made by the Department at Washington. These tests established more convincingly what had already been shown at Fort Collins and by the branch stations at Rocky Ford and Del Norte, that beets could be commercially grown for sugar in most sections of the state. Even under the dry land conditions on the Arkansas Divide the results were not discouraging. The range of yield without irrigation was 9 to 22 tons and the sugar content of these beets from 11 to 18 per cent.

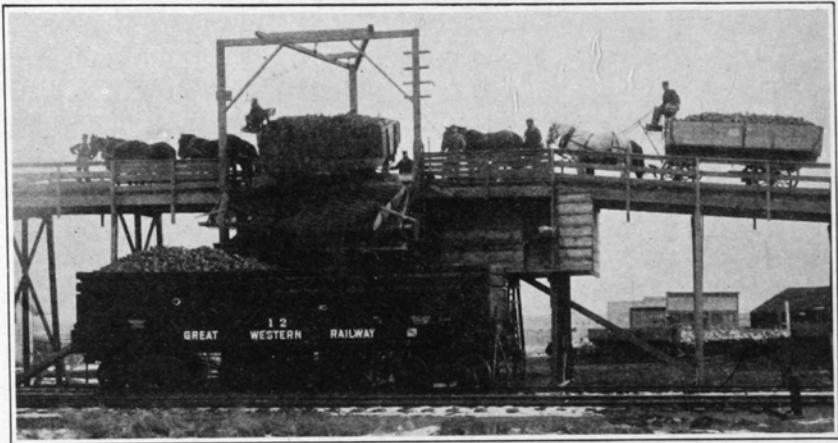
The experimental work done by the Colorado station covered every phase of production during those years, including type of soil, time of planting, depth of planting, time of plowing, sub-soiling, distance between rows, distance between plants in the row, quantity of seed, germination, cultivation, thinning, number of irrigations, varieties, tonnage, sugar percentages, ripening dates, fertilizing, freezing of beets, feeding of by-products, effects of alkali, size of beets, loss in topping, cost of growing and harvesting. In fact, there is absolutely no phase of the industry appertaining to the farm that was not tested, tried and reported on for the benefit of the early beet growers of Colorado. In later years the experimental work with sugar beets has been largely left to the sugar companies, who are at work constantly on immediate problems of the industry. There is in the bulletin library of Colorado Agricultural College and the State Experiment Station a mass of sugar beet literature in which, it would seem, no point was overlooked by the investigators in laying the foundation for the present prosperous industry.

INDUSTRY STARTS ON THE WESTERN SLOPE

Without knowledge of these continued attempts along the Eastern Slope through a long period of years, to establish the industry, it remained for Western Slope people to get in touch with the developments in Nebraska, as well as in Utah, and in a few years to build and operate the first sugar factory in Colorado, the location being Grand Junction. It was in 1892 that Mrs. C. E. Mitchell, wife of a Grand Junction druggist, while visiting at Grand Island, was shown through the sugar factory, which had been established there in 1890. On her return home she got Mr. Mitchell

interested and within seven years, in spite of the interruption of the panic of 1893, sugar was being manufactured in Colorado.

RHONE GROWS BEETS.—A year or two before Mrs. Mitchell's visit to Grand Island beets were grown in a small experimental patch by the late Henry R. Rhone of Grand Junction, who related his experience as follows:



Farmers delivering sugar beets at receiving station for shipment to factory.

“It was while the peach trees were growing that I thought of planting something between the rows and I put in vegetables and among them sugar beets. I knew Henry M. Teller quite well, and in talking with him he thought that this valley might grow sugar beets, and he said he would have Uncle Jerry Rusk (then Secretary of Agriculture) send me some seed. He did that and I planted them. That was in 1890 or 1891. I sent samples to Washington and they tested very good, running 15.50 per cent sugar and 85 coefficient purity. This was the first demonstration that the sugar beet would grow here. These beets were given scant attention, never thinned nor cultivated.”*

Ralph Voorhees, a citizen of Denver, obtained the first pound of sugar made at the Grand Junction factory, and to his effort is due the fact that a record of the various steps taken by Mr. Mitchell and the citizens of Mesa and Garfield counties has been preserved. The story written by the late Mr. Mitchell for Mr. Voorhees was published in the Grand Junction Sentinel, November 1, 1925, and its essential part is herewith reproduced:

*Letter from Henry R. Rhone to D. W. Working, under date of February 5, 1925.

MR. MITCHELL'S OWN STORY

During the summer of 1892, Mrs. Mitchell, during a trip to the East, visited at Grand Island, Nebraska, and while there was shown over the beet sugar factory just established at that place. It interested her very much and on her return she told me regarding the factory and the raising of the beets. Never having heard of it before, it was a matter of considerable interest to me and I began to inquire into it and secure books and papers relating to the beet industry in the United States. As I investigated it, I became more and more interested and talked with several of our citizens regarding the same, and finally discovered that a factory had been located the previous year at Lehi, Utah, 250 miles from us. It seemed probable that if it could be successfully operated there, it could in Grand Valley, and the thought occurred to us that perhaps we ought to use some efforts to secure one here.

In the fall of 1893, with the idea of more thoroughly investigating the business of actual operation, I consulted with Edwin Price, editor of the Grand Junction News, and the result of our consultation was that he agreed to secure me transportation to Lehi and return, provided I gave him on my return an account of the industry as I saw it at Lehi.

This trip was made and the result published in the Grand Junction News under dates of December 23 and 30, 1893. Considerable correspondence was had with the officials of the Utah Sugar Company, and a great deal of interest was taken by them in our community. So much so, that about February, 1893, the president of the Utah Company, Bishop Cutler, and the superintendent, C. A. Granger, and the agricultural superintendent, George Austin, visited us, met our people, and talked with them regarding the sugar industry.

In the spring of that year, a small company was formed by our citizens for the purpose of testing our valley as to the fact of its being a suitable place for beet raising. In this connection it is proper to say that W. H. Lee, one of our pioneer grocerymen, was the first person who offered me \$50 for the purpose of conducting experiments. He was joined in this subscription by the following gentlemen who contributed each \$50: Benton Canon, Thurlow Hutton & Williams, C. N. Cox, A. A. Miller, J. S. Kent, A. J. McCune, Gatt & Co. The county commissioners were induced to offer a bounty of \$1 per ton for all beets raised in this county during that year and sold to a sugar factory. S. H. Babcock of the Rio Grande Western took much interest in the matter and seconded the effort made by giving us the very low rate of \$2 per ton on beets from here to Lehi. The money subscribed was expended in purchasing seed from the Utah Sugar Company and securing the services of a Mr. Austin to come over here and take charge of the planting for us during that spring. A beet seeder was purchased and was loaned out among the farmers and we succeeded in getting some forty odd patches of beets planted. From these beets we shipped three carloads that year to Utah. The results were exceedingly good and encouraged us to continue our efforts during the next year which we did, and during that year we shipped four carloads of beets which ran equally as well as the first.

A great deal of help was at all times rendered us by the railroads centering here, and our community is under special obligations to Mr. Jeffery of the Denver & Rio Grande road for free transportation of persons wishing to travel and investigate the beet sugar business, as well as transportation and express of all necessary samples.

Owing to the uncertain condition of the tariff laws about the years 1894 and '95, general interest throughout the country in the beet sugar business languished and ours with it for the time being. In 1897 we were visited by Hon. Jas. Wilson, secretary of agriculture. He was enthusiastic on the subject of beet raising and so revived the interest of the community in it. The work was again taken up. It is proper to mention that during all the time this work was going on we continually had the help of citizens in Garfield county as well as the Garfield county commissioners. In mentioning the help had from Garfield county, it is but just to particularize and mention the name of H. J. Holmes, editor of the Glenwood Avalanche. He has been a consistent and hearty supporter of the beet industry at all times and in all places.

We also had the support of Montrose and Delta counties and in this locality we had a particularly enthusiastic helper in the person of Wm. Endner.

As has been said, after Mr. Wilson visited us in 1897, the matter was again pushed by our citizens, and in the spring of 1898 we received a visit from some 20 citizens of

Garfield county, who came here to join with Mesa county in a large and enthusiastic beet sugar meeting. The result of this was that both Garfield and Mesa counties appropriated \$150 each for pushing the advantages of the western slope of Colorado attending the beet sugar industry.

It was about this time that Chas. N. Cox became particularly interested in the matter. An offer was made by the commissioners of Mesa county of 1 percent on the capital invested in a sugar factory in Mesa county, provided the cost of the same should not be less than \$350,000. This amount of 1 percent was to go as a bonus to the person or persons causing capital to erect a factory here. This offer was afterwards increased to 3 percent and about the first of April, 1898, the work was begun by Chas. N. Cox, and during the spring and summer he interested himself in it to a large extent. So much so that by fall he felt he had enough capital in sight to justify the citizens of Mesa county in taking active measures. In September, 1898, the county was canvassed by Messrs. Mitchell and Cox, and pledges of 2,000 acres of beets were secured from the farmers for three years. Meetings were then held in the town and from the citizens an additional pledge of 1,500 acres was secured. The work of securing a land bonus of 1,500 acres was taken up, and by united effort on the part of all the citizens, it was finally secured. Armed with this offer of 3,500 acres for three years and a bonus of 1,500 acres of land, Mr. Cox again went after his capital and finally on the 8th day of February, 1899, the contracts for a factory here were let by Colorado Sugar Manufacturing Company to E. H. Dyer & Co., of Cleveland, Ohio.

GRAND JUNCTION'S FIRST SUGAR RUN

The Grand Junction factory marketed 6,600 sacks of sugar in 1899, the plant being incomplete and not able to slice all the beets offered. In the second year the output had risen to 8,700 sacks, the sum paid for beets that season being approximately half a million dollars. The original operating company was formed in January, 1899, the incorporators being John F. Campion, J. R. McKinnie, Charles Boettcher, Charles N. Cox, Charles E. Mitchell and George W. Trimble. The board of directors was composed of Eben Smith, Charles Boettcher, John F. Campion, J. J. Brown and J. R. McKinnie. The capital stock was \$750,000. Grand Junction donated 1,500 acres of land as a factory site. A new company took over the plant in 1900, this company being officered by George N. Nagle, president; H. M. Bennett, vice-president; J. R. McKinnie, treasurer; J. F. McFarland, secretary and manager.

RECORD OF INDUSTRIAL PROGRESS

From that time forward the progress of the industry is a continual record of promotion and accomplishment, which is a subject for the recorder of manufacturing enterprises rather than the agricultural historian. The first factory in operation on the Eastern Slope was that at Loveland, built by practically the same group of Denver capitalists that financed the Grand Junction plant, though agitation for the factory was started by W. D. Hoover, a pioneer promoter who laid the foundation for several sugar enterprises, though others, in most cases, reaped the financial rewards. Hoover's investigations centered at Grand Junction and Lehi and on the

basis of tests, cost of operation and other factors he put his argument for establishment of a factory at Loveland, his prospectus being dated September 11, 1899.

This prospectus set forth the fact that seven carloads of Colorado-grown beets had been sent to the factory at Lehi, Utah, and nine carloads to the Grand Island, Nebraska, factory, and that the report on them was entirely favorable. The beets shipped to Lehi were grown by the following named Grand Valley farmers: W. H. Benkit, P. A. Rice, Mr. Curie, A. A. Miller, A. J. McCune, Ed Bevier, C. W. Steele, Eugene Allison, N. Poffenberger, L. Johnson, Joe Smith, Frank Leach, C. N. Cox, George Davis, Frank Rich, John Pough, Smith Bros., Mr. Arhnes, and the Indian School. These beets tested 15 to 16½ per cent. Shipments to Grand Island included six cars from Loveland, the shipper being H. Michelson, two from Greeley and one from the Agricultural College at Fort Collins. Michelson was assistant to Receiver Frank Trumbull of the Colorado & Southern, that company having furnished beet seed to farmers in the Loveland district, contracting with them for the crop. In this way the railroad company was doing its share in encouraging the establishment of the industry. The Loveland beets averaged 15.36 per cent sugar; those from the college 14.6 per cent.

Mr. Hoover pointed out that the industry would be protected against unreasonable competition in several ways. Colorado had consumed during the year previous about 24,000 tons of granulated sugar, providing a good local market with favorable freight rates and a protective tariff, equivalent to fifty cents per hundredweight. Contracts had been made with farmers to grow beets for three years at \$4.25 per ton, 3,500 acres having been signed up, and in addition the company expected to plant 1,500 acres on its own land.

SWINK IMPORTS SEED.—George W. Swink, of Rocky Ford, a pioneer in agricultural development of the Arkansas Valley, is given credit for starting agitation that finally resulted in establishing the sugar industry in that region. While in the state senate he introduced a bill appropriating \$500 for sugar beet investigations. He was laughed at for his pains and the bill was defeated. He imported several hundred dollars' worth of seed from Germany and distributed it among farmers in Otero County for tests that demonstrated the suitability of soil and water conditions for beet growing. He saw to it that samples of these beets were sent to Washington and tested for sugar content, and he was among those who finally succeeded in inducing manufacturers to locate in the Arkansas Valley.

TELLS PRESIDENT ROOSEVELT.—In February, 1906, Senator Swink wrote a letter to President Roosevelt, in which he reviewed his own efforts

in behalf of the sugar beet industry in the Arkansas Valley. This letter was necessitated by the fact that Senator Swink was ten minutes late in keeping an appointment with President Roosevelt at Washington. Senator Swink had been summoned before the Philippine Committee to attend a hearing on the sugar tariff. Before he could get away his time to see the President had elapsed, hence the communication from which the following is quoted:

I trust you will pardon me for writing you on a subject with which you are so familiar, that is the Sugar interest of the Great West, for which section of the country I know you have a warm feeling. The sugar beet industry is an enterprise that I have been greatly interested in for many years and I write from a farmer's standpoint. In 1871 I came to Colorado. At that time there was not any farming done in this part of the state and it was thought that nothing could be done in the way of agriculture or horticulture. In 1873 we commenced to build our first canal. In 1874 I moved my family, wife and eleven children, out from Illinois to Colorado. In 1874 I began to experiment to see what might be successfully grown, by putting out a garden. Not having our canal done we drew the water out of a well put in barrels and irrigated from the barrels with quite satisfactory results with our garden. In 1875, got our ditch out to my place and put out forty acres of almost all kinds of grain and vegetables, with very satisfactory results, especially with vines and root crops. Finding that the garden beet did well and seeing the importation of sugar from Germany, I thought this country might be a good country in which to produce beet sugar so I began to experiment on sugar beets. I bought seed from our American seedsmen which proved unsuccessful. I seemed to have everything but a sugar beet and for many years we made but little progress as the range stock interest was very much opposed to any farming; however, I continued the experimenting, sent to Washington and in 1892 I also got seed from Germany and from these seeds I got good results showing a high percentage of sugar and purity. From Washington I got all the information I could, some very valuable, also got in correspondence with parties in Germany in order to learn the conditions in general, such as climate, soil, tonnage, percent of sugar purity, cost of labor, etc., and I found that one of the very important things with which we should have to compete was cheap labor. From Washington I received some very valuable literature, among which was a map showing the belt of country supposed to be adapted to the growth of sugar beets. In 1893 I introduced a bill in the Colorado State Senate for an appropriation of five hundred dollars to import beet seed and was turned down hard by the Agricultural and Irrigation Committee on the grounds that we could not compete with the cheap labor of the old countries. My contention was, the difference of cost of fertilization, the tonnage percent of sugar and the duty and that our American farmer could grow beets and compete if they, Germany, got their labor for nothing, and the trouble with the Committee was, they did not know enough soon enough.

I ordered, on my own account, quite an amount of seed by express from Germany, took this seed to the farmers and asked them to grow it. The next fall I went around, collected the beet samples and sent them to Washington and from these tests made we were able to convince capital that it was safe to put in a sugar plant but we then found we did not have the people to grow the beets to maintain a plant so we went to work encouraging the growing of small stuff such as melons, cantaloupes, tomatoes, pickles and other small stuff to encourage the settlement of the country.

In 1900 we got a plant put in and it proved to be a success and has been a great boon to this arid country as our land values and homes depend on the supply of water. It does not take any more water to grow an acre of beets than it does an acre of other crops, and the returns are fully ten times greater per acre. Our values of real estate are in the amount of water and its prior right of the water. * * *

It has been practically shown that the growing of sugar beets and the manufacture of beet sugar can only be made successful in an arid country. See the progress and development of this state in the first six years. In 1890 we had one sugar plant, today we have thirteen and two more under construction, each with a thousand ton capacity per day. * * *

Mr. President, any legislation that might be had to discourage the sugar industry to bring our labor in competition with cheap labor, we fear would be very detrimental to our farming interest and the development of this country and would discourage enlargement of canals, the building of reservoirs to store floodwaters. It would discourage many that have homes and deprive thousands of families of a home who might have one, with the progress of the country as it is today.

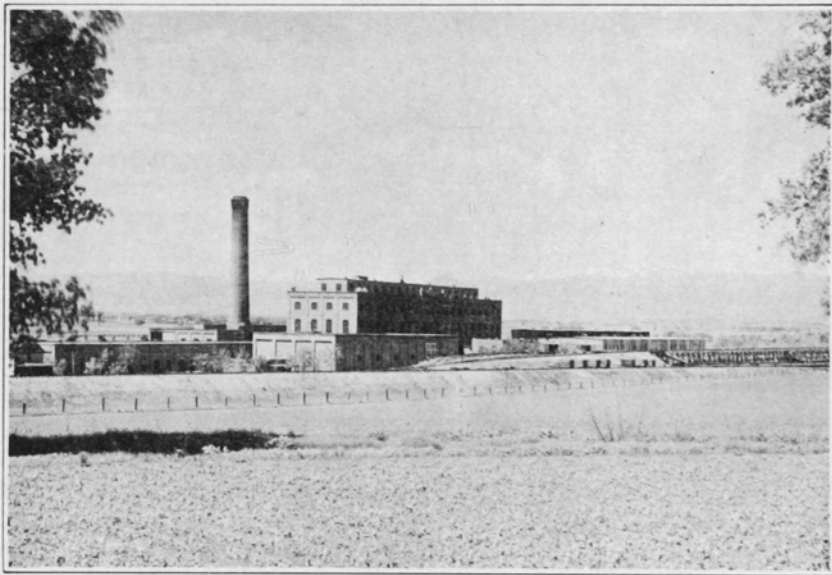
With the highest regards and well wishes, I remain

Yours most respectfully,

G. W. SWINK.

LOVELAND FACTORY STARTS.—The Loveland factory started operations in 1901, and while Mr. Hoover did not put through his promotion, the prospectus, nevertheless, aided the company, which finally furnished the required capital.

In the meantime progress had been made in the Arkansas Valley, two factories having been built in 1900, the locations being Sugar City and Rocky Ford. The National Beet Sugar Company erected a plant at Sugar City, acquiring 12,000 acres of land and completing their factory and



The Great Western Sugar Company's Factory at Longmont.

building a town within the year. Their total investment in lands, water rights, buildings, etc., was three million dollars and the factory had a capacity of 1,000 tons. The American Beet Sugar Company built the plant at Rocky Ford, but experienced some difficulty in securing a guarantee of 4,000 acres. The farmers were slow to sign up because of lateness of the season, and business men of Rocky Ford finally contracted to grow

700 acres of beets on leased land. The company acquired 6,000 acres of land and the factory was ready for operation late in 1900.

GROWER FACTORY FAILS.—From time to time efforts have been made to induce beet growers to build and operate their own factories, and these efforts eventuated in the erection of a sugar plant at Fort Lupton in 1920. This plant, built by stock subscriptions from beet-growing farmers, proved unsuccessful and failed after operating several seasons. After going through receivership it was sold in 1925 to the Great Western Sugar Company and is now being operated by that corporation. Sentiment at the time this is written (1926) seems to favor the division of effort customary in our economic system, leaving to the farmer the growing of beets under contract to the manufacturer, with a growers' association handling price negotiations each season on a commodity basis. This association, known as the Mountain States Beet Growers, is described in detail in another chapter.

ALL FAVOR SUGAR TARIFF.—During the early years of the industry there was marked division among political leaders as to whether there should be a tariff on raw sugar. The National Democratic party was committed to a tariff for revenue only, and many of its followers were free-traders in principle. As the sugar industry grew in importance political pronouncements were altered to conform to industrial expediency, and one after the other of the Democratic statesmen in the beet sugar regions capitulated to the idea that sugar needed a protective tariff.

In 1913, during consideration of the Underwood tariff bill by Congress, Colorado was aroused and manufacturers, growers, commercial organizations, farm organizations and bankers unitedly demanded protection for sugar. President Wilson had recommended putting sugar on the free list. The protectionist Democrats at that time fell back on the statement in the Baltimore platform in their support of a tariff on sugar, this saving clause reading as follows: "We recognize that our system of tariff taxation is intimately connected with the business of the country, and we favor the ultimate attainment of the principles we advocate by legislation that will not injure or destroy legitimate industry."

That has ever since been accepted as good political doctrine regardless of party, in Colorado, in its relation to the sugar industry.

SEVENTEEN FACTORIES OPERATING.—In 1926 there were seventeen beet sugar factories in operation in Colorado, twelve of these being owned by the Great Western Sugar Company and the others by the American Beet Sugar Company, the Holly Sugar Corporation, and the National Sugar Manufacturing Company. Following is a list of factories, with the slicing capacity given in tons for each 24 hours: Great Western Sugar Company: Brighton, 1,650; Ovid, 1,650; Loveland, 2,750; Greeley, 1,200; Eaton,

1,350; Fort Collins, 2,750; Windsor, 1,350; Longmont, 2,750; Sterling, 1,350; Brush, 1,400; Fort Morgan, 1,400; Fort Lupton, 975. The Great Western also is to operate, beginning in the winter of 1926-'27 at Johnstown, a molasses de-sugarizing plant with a capacity of 100 tons of beet molasses every 24 hours.

American Beet Sugar Company, Rocky Ford, 1,600.

Holly Sugar Corporation: Grand Junction, 600; Delta, 600; Swink, 1,200.

National Sugar Manufacturing Company, Sugar City, 500.

While the sugar factories could not run without the beets which the farmers supply, it takes money to operate. In spite of all the efforts made by farmers who started agitation for sugar manufacture during pioneer days, the business did not get under way until capital saw in it a source of profit. Colorado men and Colorado money started the industry, and while outside capital came in later, the Colorado financiers had to prove that the industry could hold its own against cane sugar competition and cheap foreign labor in Cuba and the Philippines before unstinted backing was given. That the industry has grown to such tremendous proportions remote from the sea coast is ascribed to the great increase in the world's consumption of sugar, the economies of production, manufacture and distribution and the maintenance of a protective tariff. Men who were prominent on the financial side of sugar in the early days of development in Colorado, some of them still active, include Charles Boettcher, C. S. Morey, John F. Campion and Wm. Bird Page of Denver, H. O. Havemeyer, New York; M. D. Thatcher, Pueblo; J. R. McKinney, Colorado Springs.

STATE'S GREATEST AGRICULTURAL ASSET

Sugar beet production has proved to be the greatest single factor in income from agricultural effort. At the close of the period covered by this history, farmers were receiving annually about \$20,000,000* for beets. Money value, however, does not convey completely the idea of what the industry means to the state, because of its ramifications. Sugar made from Colorado beets in Colorado factories, has a value of around \$40,000,000 a year. These are gross returns, representing money put to use by reason of the crop. The distribution is shared by the farmer, the farm laborer, the business man, the transportation company and many other agencies that have a part in production, manufacture and movement of the crop in which Colorado is now first of all the states.

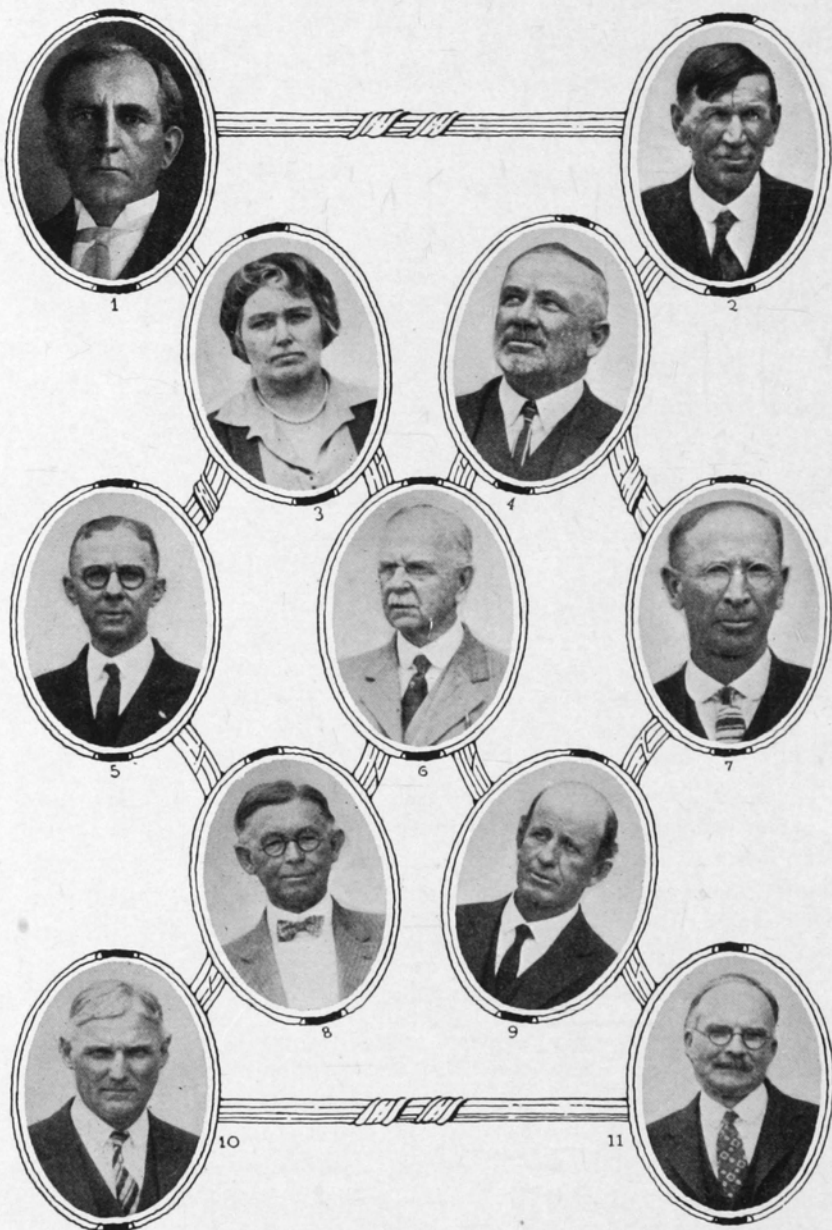
Allied to the growing of beets on farms are the industries of beef and lamb fattening and dairy farming, in which beet pulp, tops and beet

*The estimate on the 1926 beet crop for Colorado was that farmers would be paid \$25,000,000 for it.

molasses enter into the ration that makes meat and milk, adding thus to the farm income. The farm animals produce fertilizer that is put on the land to insure a good yield of beets. Alfalfa plays an important part in the scheme of crop rotation with beets, for its fertilizing value and for hay in feeding. Cultivation of the soil for beets must be thorough, which means that the crop induces good farming. This necessity of the crop for careful farming results in maintaining soil fertility, and the operations of feeding and milk production provide new sources of income to compensate for the labor cost in growing the beets.

Prior to 1900 the best of the state's irrigated sections were beginning to show decline in fertility, due to the growing, mainly, of cash crops and the lack of feeding operations to restore lost plant food. Attention then was centered on alfalfa, but this hay crop offered a one-sided solution of the problem, and not until beet growing became general was the balanced scheme worked out that puts more money in circulation than any other crop grown in the state and, at the same time, requires a safe system of farming.

All the gold and silver that has ever been taken from the mountains of Colorado, or that still may be awaiting the touch of the pick and drill, cannot compare in value to the wealth already produced in twenty-five years by the beet crop, and yet to come, for unlike mining, good farming does not impair prospective yields, and a well-nourished soil insures continuous production. Therefore, the contribution of Peter Magnes and other sturdy pioneers to the state's wealth through their early agitation of beet growing, is of far greater practical significance than the discoveries of the Green Russell party and of John Gregory. And yet, if the gold discoveries had not been made, where would Colorado be, agriculturally and industrially?



State Board of Agriculture in 1926: 1—Judge John C. Bell; 2—John S. Calkins; 3—Mrs. Mary H. Isham; 4—W. I. Gifford; 5—Governor Clarence J. Morley; 6—A. A. Edwards, president of the board; 7—J. B. Ryan; 8—John F. Mayes; 9—E. R. Bliss; 10—President Charles A. Lory; 11—L. M. Taylor, secretary.

CHAPTER IX

Economic Development of Agriculture

The best measure of agricultural progress is found in the fact that great quantities of surplus crops are shipped out of the state annually above all domestic needs. This surplus of commodities produced on the farm is made up mainly of wheat, sugar, beef, mutton, wool, apples, peaches, pears, cantaloupes, head lettuce, celery, cabbage and potatoes.

During the pioneer period the first question was food for the arriving settlers. In the first decade that question solved itself through production of staple crops, the establishment of mills and the organization of a supply to meet home demands. In the period before the railroads reached the Rocky Mountains necessity compelled people to live more simply; and, fortunately, it was found that the soil and climate were favorable to the production of bread, meat, milk, garden stuff and the things most essential for the table.

After 1870 economic conditions changed. The fact that quick transportation had been provided created a greater demand for imports at that time classed as luxuries. While bringing in goods the railroads also furnished the desired outlet for cattle and sheep from the Colorado range, as well as facilitating the development of the mines, thereby creating better home markets for produce from the farms.

NOT ENOUGH FARMERS.—As early as 1875, attention was called to the fact that much more money was being sent out of the state for food and feed than seemed justifiable, when the opportunities for farming were considered. Figures given in another chapter show that for the year 1874 the sum of \$1,300,000 was sent out of the state, both east and west, for butter, eggs, corn, corn-chop, barley, potatoes, onions, cabbage and other crops that could have been produced in Colorado, had there been enough farmers.

McCLELLAND GIVES FIGURES.—Ten years later the question was again agitated. Figures were given by J. S. McClelland, a Fort Collins farmer, showing that the value of produce shipped into the state during 1884 was \$3,305,256. This total was made up of the following items:

Cut meats	\$1,147,014
Beans	12,822
Hay	31,003
Vegetables and potatoes.....	34,424
Butter	1,176,745
Cheese	70,434
Eggs	248,140
Chickens	282,855
Apples	133,811
Grass and bulk garden seeds.....	165,000
Total	<u>\$3,305,256</u>

McClelland made the point that farmers were growing too much wheat and failing to diversify their crops. He called attention particularly to the opportunity for dairying, showing that the entire wheat crop of Colorado in 1884 was valued at less than the amount sent out for dairy products; and less also than the amount spent for dressed meats. At that time beef on the hoof was going out of the state in trainloads, but the people were buying back the dressed meat and paying freight on it from the Missouri River or Chicago, because there were no slaughtering plants with sufficient capacity to supply the demand.

DEMAND OUTSTRIPS SUPPLY.—There seemed to be no way then of applying this information in an organized way. Agricultural development went on gradually, but demand continued to outstrip supply until it reached such proportions in 1909 that the state was aroused. A survey of the agricultural industry, based on the imports of the year 1909, was made public in Bulletin 153 of Colorado Agricultural College by H. M. Cottrell. This survey developed that \$32,616,140 had been sent out of the state during the year for food which could have been produced in Colorado.

COTTRELL ASTONISHES THE STATE.—Cottrell was director of Farmers' Institutes, now known as Extension Service, and he had made an analysis of production to discover what was wrong with the farming industry and what might be done to improve the agricultural income. The list of imports was as follows:

	Estimated Value
Fat Animals for Slaughter.....	\$ 3,568,380
Fresh Meats	1,094,080
Cured Meats, Lard and Butterine.....	2,546,680
Canned Meats	1,200,000
Dairy Products	3,986,000
Poultry and Eggs.....	4,000,000
Wheat	3,750,000
Flour	1,500,000
Millstuffs and Corn Meal.....	860,000
Corn	2,530,000
Oats, Rye and Barley.....	310,000
Breakfast Foods and Food Cereals.....	1,122,000
Crackers, Wafers and Fancy Biscuits.....	350,000
Broom Corn	96,000
Hay	1,450,000
Field Seeds	240,000
Fresh Fruits, Melons and Vegetables.....	1,993,000
Canned Fruit and Vegetables.....	1,345,000
Dried Fruits	500,000
Pickles, Catsup and Pork and Beans.....	175,000
Total	\$32,616,140

BULLETIN GIVES DETAILS.—These figures hit home. The bulletin went into detail on each commodity. Of the 241,570 hogs received at the Denver Stockyards in 1909, 61,947, a fraction over one-fourth only, were grown in Colorado. Over two million dollars' worth of hogs were shipped into the state for slaughter, while half a million was sent out for fresh pork, \$918,000 for smoked meats and \$520,000 for lard. The corn belt sent Colorado 27,039 head of fat cattle and 2,522 calves during 1909.

It was estimated that Colorado was consuming 10,000 pounds of butterine a day, instead of making and using its own butter. Three million dollars' worth of dairy products, including half a million dollars' worth of cheese, had been shipped in, Colorado farmers supplying only a little over one-fourth the dairy products consumed in the state.

Eggs and poultry also showed an astonishing balance of trade against Colorado producers, the money value of the imports being \$2,000,000 for eggs and an equal sum for poultry. Fifty carloads of eggs from cold storage plants in other states were shipped to the Denver market in a single month.

An investigation made by the Pueblo Business Men's Association showed that more money was being sent out of that city to other states for poultry and eggs, than was being spent in the city for all living purposes by the four thousand employees of the steel plant.

Wheat was one of the surplus crops, a large excess being produced above home needs, though Colorado bakers were importing great quantities of hard wheat flour to offset the out-shipments of soft wheat.

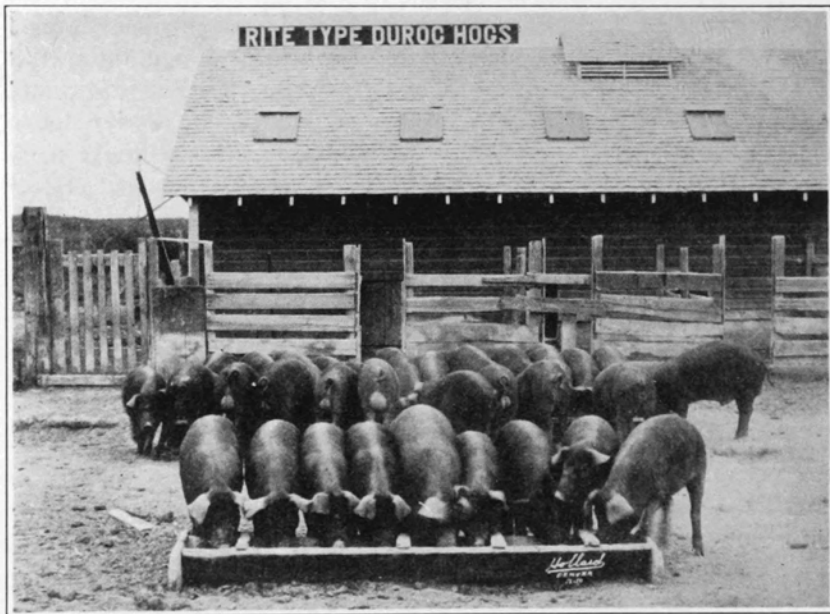
In corn the story was that 3,700 cars had been shipped in during 1909 at a value of \$2,530,000 from Kansas and Nebraska for use in feeding.

Ten thousand cars of hay came into the state in 1909, valued at \$1,-450,000, used mostly for horse feed. To offset this item, however, Colorado shipped alfalfa to southern markets in large quantities.

MINING INCOME BALANCES IMPORTS.—Practically every item of food produced in the state was thus analyzed. To impress the lesson it was stated that the entire output of Colorado's metal mines for 1909 was \$33,211,527, these gross returns being but little more than would be necessary to pay for the agricultural products shipped in.

"Nearly every agricultural product shipped into Colorado could have been more easily produced in the state, at a greater profit, and under conditions more enjoyable for the producers than in the sections where it originated," was the statement made in the bulletin.

MORE EFFICIENT PRODUCTION.—What was to be done about it? Professor Cottrell's suggestion was, more efficient methods of production by farmers already in the state and more farmers to settle on the idle lands.



On the farm of George Hofmann, Iliff, who raises purebred Duroc-Jersey hogs and is a breeder of seed grains, winning at State and International shows.

"Almost every farmer in Colorado," he said, "is undertaking more than he can accomplish well, and it will be impossible to increase the present agricultural output of the state to any considerable extent unless we secure more farmers."

Cottrell made the further point that certain products would be more readily consumed if produced at home. "More meat, more butter, more cream and milk, and more fruit and vegetables, are eaten when strictly fresh, home-produced products can be secured," he said. Thirty thousand more farmers was the goal set. At that time there was a large movement of settlers into eastern Colorado. It was, in fact, the last wave of settlement, and it cheered the newly-arrived farmers to know that they were not coming into an overcrowded region, but one where there were still opportunities for the development of new farms with a ready sale for staple foods.

FIFTEEN THOUSAND MORE FARMERS.—The United States Census of 1900 credited Colorado with 24,700 farms of all kinds. The census of 1910 showed 46,170 farms, and in 1920 there were 59,934 farms. While the goal of 30,000 more farmers was not reached in the decade following Cottrell's bulletin, the increase of nearly 15,000, nevertheless, indicated conservative growth.

There are still large areas of dry farming land, practically all in private ownership, unbroken by the plow, and a considerable acreage of high mountain valleys which will become productive at some future time, as well as opportunities for more intensive farming on the rich irrigated lands by reducing the size of farms.

NOW STUDYING MARKETING.—The problem of production, however, is now studied more exclusively from the marketing angle. The farmer's first thought is: "Can I sell my products?" He does not inquire as to their destination—in or out of the state. He does aim first to produce all he can for home consumption and then to grow a surplus of any commodity for which there may be a wide demand. Colorado has, in fact, become a great surplus-producing state, and markets must be studied from national and international rather than state angles.

"COLORADO'S AGRICULTURE."—Another analysis and of a different sort, is that made of the state's agriculture and reported in "Colorado's Agriculture," a bulletin by Roud McCann, Director of Extension, and Thos. H. Summers, Farm Management Specialist, of Colorado Agricultural College, in 1924.

This report dealt with the problem of adapting agricultural production to market requirements. It was the publication of a survey inaugurated at the suggestion of Eugene Merritt of the Extension Service, U. S. Department of Agriculture, and conforming to the principles laid down in Colorado's Code of Agriculture. This code has as its foundation stone the motto: Farm returns commensurate with ability, risk and investment involved.

AN AGRICULTURAL CODE.—The four principal points in the code are: (A) To adapt production to market requirements; (B) to make rural home life attractive; (C) to interest children in practical farm work and farm home life through club work; (D) to develop progressive communities.

Reverting now to the bulletin, its plan and purposes were summed up in a foreword by Dr. Chas. A. Lory, president of the college, as follows:

LORY SUMS IT UP.—During the first forty years of its development, agriculture had the stimulus of an unsaturated market with comparatively high purchasing power and rapidly growing needs in our mining camps, which led to large expansion of the area under irrigation and of the cattle ranches. Genial climate, fertile soil, comparative freedom from plant diseases, good yields per acre, high quality of products and the challenge of new conditions were positive factors favoring the industry.

The diversion of water for irrigation and the new problems in property rights this brought, the use of the public range and the conflicting interests between the stockman and the homesteader brought much litigation and naturally forced the attention of the farmer to legislation, particularly to the formulation and enactment of laws affecting irrigation, range control, stock inspection, agricultural investigations, transportation and taxation.

Conditions of marketing and of distribution of agricultural products, while difficult, were over-shadowed by the interest in problems of production and development. In the last twenty-five years the steadily declining food requirements of our mining camps and the rapidly increasing output of our farms have made the marketing and distribution of our crops and livestock of commanding importance. Colorado has become an exporting state agriculturally and now depends on distant markets for the sale of its surplus. Upon our success in overcoming the difficulties of transportation and in meeting the requirements of these distant markets depends the economic prosperity of our State. Detailed knowledge of our agricultural production and of the trend of development in different phases of the industry in the various sections of our State, and of market requirements in quality and quantity, is essential in any effort at improvement and satisfactory development.

DISCLOSED THE GREAT CHANGE.—In this survey the great change that had come in ten to fifteen years, putting Colorado on an export basis in many staple lines of agricultural production, was disclosed. It was brought out that potatoes are produced in sufficient quantity to supply a population three times that of Colorado. Enough cantaloupes are grown to feed six times the population. Beef enough is produced to supply the wants of the state and 3,360,000 people in addition. Based on production figures of 1919, there was enough wheat to feed Colorado's population and 2,290,000 in addition. The wheat acreage increased 300 per cent in the decade from 1909 to 1919.

Dry beans increased in acreage in the same period 1,200 per cent and 700 per cent in yield, supplying the wants of two or three states of equal population with Colorado.

In 1919 enough sugar was produced to supply six times the population, and great increases have been made since.

There is still a deficiency of hogs; dairy products about hold their own, though evaporated milk is shipped out in large quantities. Poultry products show a deficiency, eggs are barely sufficient to supply the home market.

Apples, pears and peaches leave the state in trainloads, and cherries, head lettuce, pickles, and other products are exported by the carlot.

That means a large inflow of cash for farm products, a most favorable situation which may be improved, however, by more attention to marketing and better methods of production. No better proof could be offered of the suitability of soil and climate for agricultural production. Other factors insuring success are ease of financing agricultural operations, and a generally favorable tariff situation. Natural advantages, however, far outweigh those of a commercial or political cast.

SHOWS A RADICAL DEPARTURE.—The history of agricultural progress in Colorado shows a radical departure from the usual course of development. The causes are at hand. The state's area comprises 103,658 square miles; its population is about 1,000,000, in density, therefore, about 10 per square mile. Great expanses of land are unfitted for use as farms either because of altitude, which means short growing season and lack of a suitable soil covering, or because of sandy soils on which the growth is only good for grazing. However, the areas already under cultivation, especially where irrigation is practiced, produce heavily, so that the output per farm is far greater than in regions where the natural rainfall is relied upon.

The industries of America developed first along the Atlantic Coast, where shipping was available. The movement inland was gradual, becoming rapid with the building of railroads, but stopping short with the change from a semi-humid climate of the great central valleys, to the semi-arid climate of the plains. On the Pacific Coast there was early development of commerce and industry, due to the sea. There the belt is narrow, being confined to the coast line, for the aridity inland soon limits settlement to the favored spots.

Until there is a more intensive development of raw materials—metals, fuel and oil—of the semi-arid region, agriculture, so intensively carried on by irrigation, must seek outside markets. Thus it is that Colorado's development has differed from that of Illinois, Indiana, Ohio, and even of Iowa and Missouri, where manufacturing industries built up large cities that are sustained by the surrounding country. Kansas and Nebraska's development show this in a lesser degree, for already as we approach the center of these western states, the treeless prairies tell us plainly that here settlement is getting thin. Consequently the middle plains area, fitted admirably to produce a surplus of hard wheat without irrigation, seeks its markets eastward in the industrial centers, or for export. The same is true of the dry farming region of eastern Colorado, where land is plentiful and settlement thin; and also of the irrigated regions which are thickly settled, and have greater production on fewer acres.

BEAUTY THE MISSING FACTOR.—If a change is to come in the plains region where there is no irrigation, the first step must be more beauty in the landscape. There is an inborn love of trees in all of us that makes the prairies monotonous and life on them a trial. It is not alone the short rainfall that depresses the dry land farmer; it is the unsatisfied desire for beauty. Trees and more trees, shrubbery, grass, flowers—these are needed more than drouth-resistant strains of crop plants or better methods of soil culture. These things are interdependent, of course, but the emphasis is wrong if it is too much on the field crops and the farming methods, and unmindful of the element of beauty. This beauty, which our forebears had in the eastern wooded regions of America, or in European countries, must be supplied. It is the missing factor in our economic program for development of the plains. Irrigation provides it only over limited areas.

The bulletin "Colorado's Agriculture" is being used as a foundation for building regional programs of development to meet the conditions of production and marketing. This work represents the practical application of farm economics to the development of the industry as a whole.

Considering, then, the industry by commodities and applying to these commodities the system of co-operative marketing, furnishes us another interesting phase, the history of which goes back to about 1870 in Colorado.

MARKETING AND FARM ORGANIZATIONS

Co-operative marketing got an early start in Colorado; that is the idea did, though the actual process of marketing co-operatively did not come until later. It was on February 2, 1872, that the first meeting in the interest of co-operative marketing was held, the place being the Big Thompson school house near the stage station at the crossing of that stream noted in pioneer annals as "Namaqua." Mariana Modena, the half-caste Spanish-Indian, whose cabin still stands three miles west of Loveland, was a participant in this meeting; in fact, was a member of the resolutions committee which voiced the sentiment of these pioneer potato growers in their protest against what they termed a "shameful conspiracy" to deprive them of a living price for their potatoes.

A SHAMEFUL CONSPIRACY.—In the Rocky Mountain News of February 21, 1872, under the heading "A Potato Co-operative Society," appears the account of what was termed a mass meeting. Adam Blackhurst was in the chair, Frank Marvin secretary. A committee on resolutions was appointed composed of Mariana Modena, Peter Shelt, Hans Siegel, Theodore Chubbuck and Frank Marvin. The preamble recited that "a shameful conspiracy exists among Denver merchants to deprive us of a living price for our potatoes." The clause following this preamble declared that "we mutually

pledge each other that rather than haul potatoes to Denver, a distance of fifty miles, and sell them for \$1 per hundredweight, we will eat all our potatoes ourselves."

"Resolved, That if the people of all sections of Colorado believe in the principles set forth in the foregoing resolution, they will co-operate with us in extending the good work."

A committee was named to confer with Denver merchants in the effort to obtain better prices. The condition that brought about lower prices was that other sections had begun growing potatoes, hence the "over-production" and consequent break in the market.

COLONISTS TALK POOLING.—Co-operation was to be applied to every detail of agriculture in the Union Colony, which had been founded on that principle, hence there was talk of marketing on the co-operative plan as soon as crops reached surplus proportions. Pooling was tried to a limited extent during these years, but individualism finally prevailed even in this communistic colony. Co-operation survived in irrigation and established itself firmly in the irrigation practice of the state, but co-operative marketing has had to be revived in the Greeley district. In fact, there are other sections today where a larger proportion of the farmers are marketing co-operatively; this refers to potatoes.

Farmers in the Greeley district rushed their wheat to market in the fall of 1873, having more than needed to supply the local mill. In the following spring the evils of dumping were discussed by Editor N. C. Meeker in *The Tribune*, in commenting on the experience of C. C. Eaton. It seems that Eaton had stacked his wheat and waited to thrash until the spring of 1874, when he got a higher price that netted him perhaps \$100 more for the crop than he would have received had he followed the usual course of marketing in the fall.

URGED TO HOLD WHEAT.—"Our farmers all need to be able to hold their wheat in some way," wrote Meeker, president of the colony, its editorial guide and mentor, and disciple of communism in agriculture. "At present they rush into the market in fall, so soon as they thrash, and as a consequence, there is not money enough to buy the crop, and if there were, there is no storage; hence, for several months, wheat does not sell and times are hard. The Grangers ought by all means to meet this difficulty. If the farmers had a large warehouse in which they could store their wheat, money could be advanced for two-thirds its value, at a low rate of interest, and then the wheat could be put on the market from time to time as the consumption might demand. * * * Whenever wheat leaves the farmer it goes immediately into the hands of the middlemen; and the longer they hold

it the more they make. The question resolves itself into the problem, who shall control the market, the farmers or the middlemen?"

That was a clear statement of the condition and a suggestion for a remedy which has never been generally applied until within very recent years with the passage of the national warehouse act, the organization of wheat pools and the application of the Colorado marketing law.

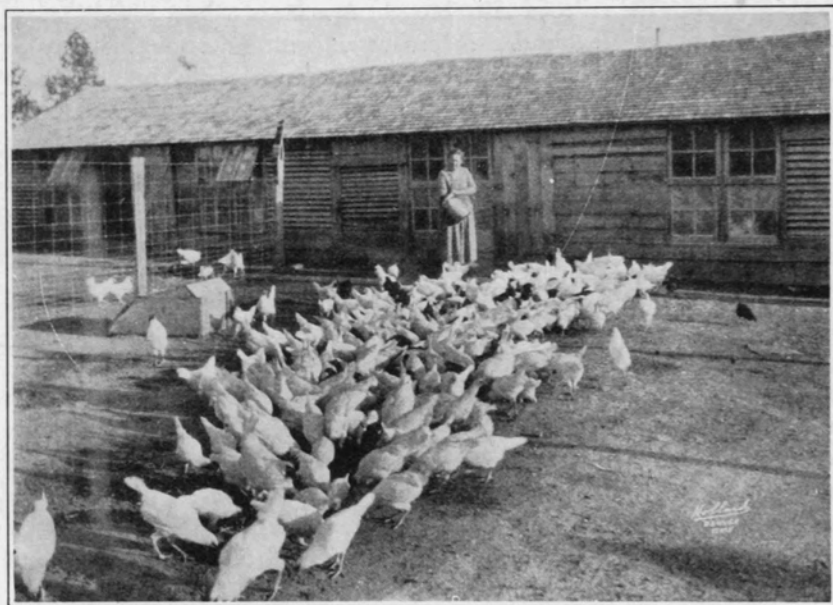
NOT A RECENT METHOD.—Wheat pooling therefore is not as recent a method of marketing as may be supposed. In 1898 farmers in the vicinity of Berthoud were planning to pool 100 carloads for shipment to Chicago. Whether the shipment was made does not appear, but the comment thereon by *Field and Farm*, a Denver journal, under date of January 8, 1898, is interesting. It was as follows:

The farmers in the vicinity of Berthoud, Larimer County, have been making an effort to pool 100 carloads of wheat for shipment to Chicago, January 15, but we hope the show will not come off at the advertised time, for the reason that Chicago, for the first time in years, is glutted with wheat and there is not a spare foot of storage in the town. Better try to sell to some Denver brokers, who complain that they cannot buy as much wheat as they want for export by New Orleans, where navigation remains open and vessels are loading every day for Europe.

Wheat marketing was a subject of concern to farmers many years before this discussion of pooling. During the period before completion of the first railroads in the early seventies, mills were built in all wheat-growing sections and they ground flour for local use. After the railroads came there was a market for surplus flour in other states and the wheat marketing problem became complicated. Distrust first appeared over crop reports in the newspapers. The newspapers were inclined to paint a rosy picture of farm prosperity and farmers usually laid the foundation for that by bragging about prospective high yields. Millers began to take advantage of such newspaper crop reports by assuming that there was a big crop and that under the influence of a plentiful supply prices should go down; and they did decline.

HAD NO CROP REPORTS.—It was then that farmers saw they were at a disadvantage regarding prices, for there were no unbiased estimates, nor any estimates in fact, which could be relied upon, so they began to withhold information. A controversy thus arose between millers and farmers regarding crop acreage and the publication of crop prospects. It was in 1877 that wheat growers were advised "to keep cool and market their wheat gradually" (*Rocky Mountain News*, August 8, 1877). Dumping was even then a common practice, the term meaning rushing the commodity to market regardless of price conditions. "Orderly marketing" is a phrase of later coinage, and that is what the newspaper meant when it advised marketing wheat gradually.

All through the early history of Colorado's agricultural progress marketing was a live problem. The great distance of the state from centers of population and from seaports brought new problems from the first. During the early days the producer followed the line of least resistance, or, better stated, the call of necessity, and sought to supply the mining towns with food. There was no transportation except the wagon train for slow freight



White Leghorn flock on the farm of George D. Wright, Vernon.

and the stage for perishable goods. And there was little likelihood of overproduction so long as the farmer confined his efforts to producing staple foods, including butter, eggs, poultry, potatoes, small fruits and wheat. The list of commodities for which sale could be found was restricted, as was the market, because of slow transportation. In many cases the farmer was his own salesman, peddling his produce from door to door in the mining towns. Much also went over the counter in barter for dry goods, clothing and for the foods that had to be brought in from the States. Hogs and cattle were sold direct to the butcher, who generally did his own killing, for there were no central packing plants, nor large stockyards with their attendant markets. The range livestock business was a large scale operation with which small farming had no connection; and the rangemen had their own problems.

RAILROADS BRING A CHANGE.—Railroad transportation made a radical change in these primitive ways of marketing. Cattle were still trailed many years after the railroads came and it was only gradually that the trails were abandoned for the rail lines. However, for other commodities produced on the land railroads took the place immediately of slower methods of distribution. Wider markets were afforded, but with these came competition from other farming districts, invading the Colorado farmer's market. Moreover, the railroads also brought thousands of new settlers, many of whom went into competition in production with those who had crossed the plains by wagon. Fortunately these new producers also were consumers, so that the balance was maintained, though marketing became a complex problem and it has remained so ever since. In the last five years more progress has been made toward its solution than in over sixty years of agricultural development that had gone before.

RIPE FOR CO-OPERATION

Like most other surplus crop producing states, Colorado was keenly interested in the subject of co-operative marketing when the wave of propaganda for this form of handling farm produce swept over the country, following the close of the World War. The depression in agriculture that came in 1920 emphasized the need for better marketing methods and put the mind of the producer in a receptive mood toward anything that offered help in securing a fair return for the capital and labor advanced by the farmer in producing his crops. Co-operative marketing, while by no means new, came to the producer's attention for the first time with the force of powerful organization behind it.

VARIOUS SCHEMES TRIED.—The subject had been thrashed out in Farmers' Union and Grange circles for years. Various schemes had been tried in Colorado as in other states, to market co-operatively and many successful local organizations were in existence for shipping livestock (principally hogs), potatoes, fruit and other products. Also there had been long and generally unsatisfactory experience by the Grange and the Farmers' Educational and Co-operative Union with co-operative mercantile establishments that bought and sold for the members of these organizations.

Elevators handling grain and beans have been in successful operation by the Colorado Farmers' Union many years. These ventures were a part of the general activities of two organizations that combine in their purposes the social and economic welfare of their membership. This pioneer work laid the foundation for the commodity marketing associations now operating successfully.

The Farmers' Equity Union, formed strictly on economic lines, has maintained an almost unbroken record of success in certain localities with

its mercantile ventures, and its operations are told of in greater detail in a separate section of this chapter. These more or less local ventures all served to prepare the mind of the farmer for the larger schemes of co-operative marketing on a commodity basis, of which there are several outstanding examples in Colorado at the time this is written, 1926.

SWEET AND SAPIRO.—Responsibility for these commodity organizations goes back to the American Farm Bureau Federation, which became a national organization in November, 1919, and made marketing one of its chief projects. It is here that Aaron Sapiro of California enters as the chief apostle of large-scale co-operative marketing and the author of the marketing plan incorporated in the statutes of many states, including Colorado. Sapiro came to Denver at the instance of Governor William E. Sweet, who became the state's chief executive in January, 1922, as a result of a political drive backed by the farmers for a better deal in economics. Sapiro delivered several addresses to audiences of business men and to farmers, and on January 10, 1922, before a joint session of the General Assembly, stirring up the state on the subject of co-operative marketing. While he aroused bitter opposition in some quarters, particularly among those who felt that their business would suffer if the farmer went into the marketing game in a big way, most of his hearers, farmers and others, admitted they had been convinced of the logic of the idea.

Sapiro's forceful and magnetic presentation of the subject had much to do with the subsequent tide for co-operative marketing in the state. The final result was the enactment of a strong co-operative marketing law and a law establishing the office of Director of Markets. The enactments carried out one of the pledges of Governor Sweet, Democrat, who had been elected by the farmers. Strong Republican counties in the 1921 election changed their political complexion on that issue and the farmers stood behind Governor Sweet during the legislative session of 1922 and got what they had demanded in the two marketing acts, which, so far, have withstood the test of litigation.

The first Director of Markets was Joseph Passonneau, who had been identified with the co-operative movement elsewhere and had been brought to the state by Governor Sweet. Passonneau was appointed July 1, 1923, and was succeeded by Dr. Barton O. Aylesworth, April 1, 1925.

DIRECTOR OF MARKETS.—The Director of Markets Act is very broad in its scope. It makes it incumbent upon the Director to protect the rights of consumer, shipper and producer. It also makes it mandatory "to promote, assist and encourage the organization and operation of co-operative and other associations and organizations for improving the relations and services among producers, distributors and consumers of any agricultural

product, and to protect and conserve the interests of the producers and consignors of such products.”

The law demands the Director of Markets to require co-operative associations doing business in the state to file with him a certified copy of by-laws and of any exclusive contract of sale or agency between the association and its members or patrons. It also provides that the Director prescribe uniform systems of accounting for co-operative associations and that he require such associations to render reports showing nature and volume of business, resources, liabilities, profits, losses and other facts bearing upon the financial condition of the association. There are other requirements which empower the Director to make investigations relating to management of associations and also relating to expenditures incident to the organization of associations.

INTENT OF THE LAW.—The intent of the two marketing laws of 1923 is to give the Director of Markets complete oversight of their activities and also that co-operative marketing associations shall not be regarded as operating in restraint of trade, the Act declaring: “No association organized hereunder and complying with the terms hereof shall be deemed a conspiracy or a combination in restraint of trade, or an illegal monopoly; or an attempt to reduce competition or to fix prices arbitrarily; nor shall the marketing contracts and agreements between the association and its members, or any agreement authorized in this Act be considered as illegal as such, or in unlawful restraint of trade, or as a part of a conspiracy or combination to accomplish an improper or illegal purpose.”

The present Director of Markets, Dr. B. O. Aylesworth, interprets the law as giving the right to bring about, as far as possible, harmony of action among both producers and distributors. To that end he is encouraging and strengthening a state-wide organization to include representatives from the various state farm organizations. Through this he expects to do away with much of the misunderstanding and hostility that has existed between some of these organizations, due largely to unfair propaganda by non-producers and politicians.

The whole purpose and intent of the Marketing Act is expressed in its declaration of policy, which reads: “In order to promote, foster and encourage the intelligent and orderly marketing of agricultural products through co-operation; and to eliminate speculation and waste; and to make the distribution of agricultural products between producers and consumers as direct as can be efficiently done; and to standardize the marketing of agricultural products and to provide for the organization and incorporation of co-operative marketing associations for the marketing of such products, this Act is passed.”

The Director of Markets Act makes it obligatory for the Director to co-operate with the U. S. Department of Agriculture in gathering and disseminating impartial market and trade information concerning demand, supply, market terms and the commercial movements of agricultural products. It also provides that the Director shall foster and encourage standardization, grading, labeling, handling, storage and marketing of agricultural products.

INSPECTION IS VOLUNTARY.—Inspection in co-operation with the U. S. Department of Agriculture, through the Office of Markets, is supervised by Mr. E. F. McKune. The service is on a voluntary basis.

There was much opposition from shippers and dealers as well as a few growers when the marketing legislation was being considered. Both measures are compromises agreed on by both sides in the controversy. Objections raised to the bills were that they would materially interfere with the business of shippers and dealers; that such legislation would be in restraint of trade because of the stringent provisions allowed in growers' contracts and because of the penalties authorized to be imposed upon independent shippers or dealers in buying or attempting to buy, the commodities of members of co-operative associations. The working out of the law has shown that dealers and shippers have suffered no loss by reason of the Marketing Act. As to the second objection, the United States Supreme Court, the United States Congress and 32 states, including Colorado, have declared that the association of farmers or producers to market their commodities by the co-operative plan is not in restraint of trade.

The only difficulty is in the operation of the fines or penalties which may be inflicted on a member who breaks his contract. Assessment of fines does not result in restoring a violator to hearty co-operation in the association. Some of the new contracts offered at the beginning of 1926 permit members to withdraw at fixed times and also provide that the association may cancel a contract during the same fixed time. This provision, it is believed, will overcome some of the difficulties hitherto encountered.

LIST OF MARKETING ASSOCIATIONS

Following is list of the marketing associations which, with one or two exceptions, are on a co-operative basis.

Colorado Bean Growers' Co-operative Marketing Association.

Colorado Wheat Growers' Association.

The Colorado Potato Growers' Exchange.

Colorado Dairymen's Co-operative Association (Denver).

Colorado Co-operative Lettuce Association, Inc. (Buena Vista).

The Co-operative Farmers Exchange, Inc. (Brighton Cabbage Growers, etc.)

The Dairymen's Association (Pueblo).
The United Fruit Growers (Palisade).
Grand Junction Dairymen's Co-operative Association.
Vegetable Producers' Co-operative Association (Denver).
Crowley Melon Growers' Association.
Arkansas Valley Beet Growers' Marketing Association.
Arkansas Valley Seed Growers' Marketing Association.
Mountain States Beet Growers' Marketing Association.
Colorado Honey Producers' Association.

The plan of organization differs somewhat according to the commodity handled and for the purposes of this history several organizations are reviewed in detail to show the varying character of these farmer groups seeking to better marketing conditions.

THE COLORADO POTATO EXCHANGE

The outstanding success among the co-operative marketing organizations of Colorado and a model of its kind that had attracted nation-wide attention in the year 1926 was the Colorado Potato Growers' Exchange. In amount of product handled for its farmer members on strictly co-operative lines, it was second of all potato marketing associations in the United States, being distanced only by the East Shore of Virginia Potato Growers, an association which has twenty-five years of experience behind it. The big season for the Colorado Potato Growers was the year ending June 30, 1926, with approximately \$6,400,000 in sales, representing 5,660 cars of potatoes and 112 cars of onions. On potatoes this meant 37 per cent of the state's tonnage handled co-operatively.

The Colorado Potato Growers' Exchange was the direct outgrowth of educational work done by the Extension Service of Colorado Agricultural College, co-operating with the U. S. Bureau of Agricultural Economics through W. F. Heppe, Extension Agent in Marketing. County Agents in potato producing sections were active in the early development of the Association, namely, W. O. Sauder, C. D. Hyatt and Ben F. King.

These men labored as public servants in the interest of the farmers, their efforts having to do with educational features—that is, pointing out the advantages of orderly marketing, standardization of varieties, grading, stressing quality first, as essential to successful merchandising of a farm produced food, sent directly from the farm to the central market. The entire state had been aroused on the subject of co-operative marketing and producers were asking questions which the Extension workers were expected to answer. When these were satisfactorily answered, the issue was up to the growers.

That was the process through which the Potato Exchange went in its preliminary history. At some points sentiment for co-operative marketing had already been crystallized by the Grange, the Farmers' Union and the Farm Bureau. But all these connections were temporarily ignored and the effort was concentrated on the commodity. Potatoes were the thing to be sold—not any organization, social, economic or otherwise, and when that idea was put across successfully, the Exchange came into being and actually leaped forward to success.

HISTORY OF THE EXCHANGE.—The history of the Exchange goes back to the spring of 1921, when local units of potato shippers in the San Luis Valley were formed on the co-operative plan. These local associations were of the non-stock, non-profit type, strictly on a commodity basis, Colorado having thus contributed something worth while to the early progress in co-operative potato marketing. The four associations formed in the San Luis Valley were federated into a single selling agency. Three of these local units—Del Norte, Center and Hooper—were on a non-stock, non-profit basis, while Monte Vista was a capital stock company. So successful were these efforts that the movement spread to the Western Slope, where during the spring of 1922 three additional associations were formed, namely at Olathe, Rifle and Basalt. These affiliated with the San Luis Valley group at a regional conference of representative growers, and these seven federated associations selected the same selling agency, thus moving their product to market through a single channel, eliminating competition against each other.

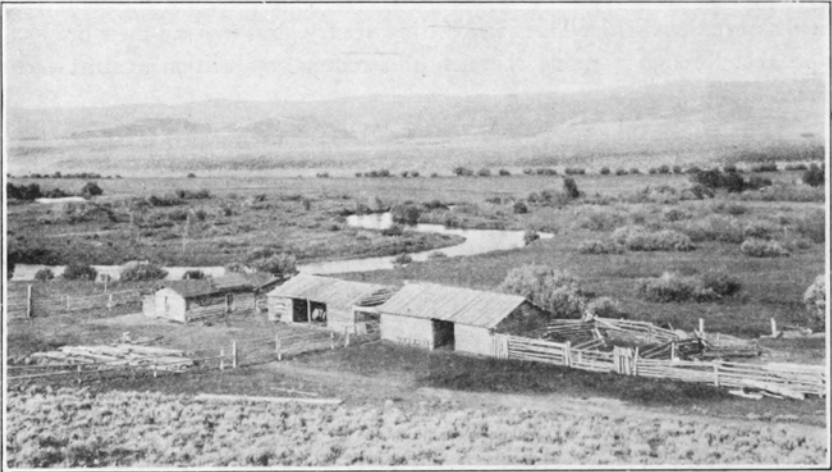
The Colorado Potato Growers' Exchange is the outgrowth of these district associations, which were meeting with marked local success and striving toward centralized control of the bulk of the potatoes produced in Colorado.

CENTRAL SELLING AGENCY.—The next step, still under the educational supervision of the Extension Agent in Marketing, was the formation of a central selling agency, covering the entire state, this also to be of the non-stock, non-profit, or truly co-operative, type, on a commodity basis, consisting of local associations at all principal potato shipping points. It was recognized that the central organization was essential in order to control the flow of products to market, bring about an effective standardization program and affiliate under one head the sales of the various local associations.

The co-operative marketing law was then pending and its passage being anticipated by the Potato Growers, efforts were continued toward a state-wide organization. It was decided to adopt the Sapiro form of agreement, then in use by the Potato Growers of Maine.

From the beginning it was recognized that the educational aspect of the work would ultimately prove the key to successful organization.

ORDERLY MARKETING THE GOAL.—Farmers wanted information about co-operative organizations in general and details essential to success in marketing on a commodity basis. Orderly marketing and standardization was set up as the chief goal and it was pointed out at conferences of growers that this could not be accomplished without pooling. The evils of dumping the commodity and of flooding the markets were explained and the fact was emphasized that if adaptation of production to consumptive demands ever were brought about, it would only come through united action. Even then, so the growers were told, they had still to face years of surplus production, and the sharing of the unsold surplus acts to hold production down to the demands of the market. All of these things were discussed in an intensive educational campaign by the Extension Agent in Marketing, which preceded the actual formation of a central organization. About forty meetings of farmers and business men were held, over two thousand potato growers attending. Twenty-six meetings for organization work followed, which found approximately one thousand growers with faith in the plan and a willingness to sink seeming personal interest in the good of the whole. These meetings were in charge of a local organization com-



Ranch of Wallis Link, Glendevey, Colorado.

mittee elected by the growers. This developed into a general organization committee of which W. S. Hill was made chairman. Intensive organization work was done under his direction, but paid solicitors were employed only during the last few weeks of the campaign.

The goal was the signing up for co-operative marketing of fifty per cent of the entire commercial acreage of potatoes. The date for closing the campaign was June 30, 1923. On July 1 wires had been received at headquarters, indicating the project had gone over with approximately 34,000 acres signed, this representing well over fifty per cent of the acreage of potatoes in the recognized commercial districts of the state. Twenty districts had been organized and meetings of all contract signers were then held in each district to complete the organization and to elect trustees to the state exchange. The thirty-nine trustees, representing twenty local associations, met in Salida July 31, 1923, where the state exchange was formally incorporated. The executive committee subsequently met at Pueblo for the purpose of contracting its potatoes, employing managers and transacting other necessary business. The Pueblo offices were temporary, permanent headquarters being established at Denver.

ON A COMMODITY BASIS.—The Colorado Potato Growers' Exchange thus was the first state-wide co-operative organization to be formed on a commodity basis. In his last report to the Extension Service covering the period December 1, 1922, to August 20, 1923, Mr. Heppe said: "The Exchange will handle annually from two million dollars to three million dollars worth of products. The Exchange has a membership of about 2,000 potato growers. Cost of organization, which was covered in part by membership fees, totaled about \$11,000. This ends what we believe has been one of the outstanding developments in Colorado agriculture and whose influence in the coming years will be far-reaching."

That the estimate of volume of business would be trebled in the third year of the history of the Exchange was unlooked for, even by the most optimistic advocates of co-operative marketing. In 1926 there were 22 local units, these being as follows: Antonito, Ault, Carbondale-Basalt, Carmel, Center, Delta, Eagle, Fruita, Gill-Galeton, Gilcrest-LaSalle, Hooper, Kersey, La Jara, Montrose, Monte Vista, Morgan County, Olathe, Romeo, Rifle, Del Norte, Severance-Windsor, Craig.

Each has its salaried manager, the salary being fixed by the local, according to the extent of the tonnage handled, some being engaged by the year, some by the month, some on a carlot basis. All locals are separately incorporated under the State Marketing Act. All members' contracts are both with the local and with the Exchange. There is a contract also between each association and the Exchange. On July 1, 1926, the Exchange had 2,337 members, while in 1923 the membership was 1,926.

The officers of the Exchange at this time (1926) are: D. W. Aupperle, president, Grand Junction; J. P. McKelvey, vice-president, La Jara; M. I. Chenoweth, secretary-treasurer, Del Norte. These officers, with T. C. An-

derson of Olathe and C. A. Finch of Eaton, comprise the executive committee. Ben A. Gibson is general manager and W. F. Heppe, field manager. Other executives are: D. C. Sims, assistant sales manager; R. V. Painter, traffic manager; W. W. Davis, office manager, and W. G. Lewis, Denver salesman. In addition to the Denver office there is an office at Fort Worth, Texas, which is one of the important marketing points for Colorado potatoes. The crop goes to distributing centers in Nebraska, Kansas, Oklahoma, Texas, Missouri, Illinois, Indiana, Ohio, Tennessee, Arkansas, Alabama, Florida, Mississippi, Louisiana, New Mexico, Arizona, Utah, Nevada and California.

A REGISTERED BRAND.—A registered brand, the "Colotato," is the standard pack for special quality, reserved for a certain percentage of potatoes put up in 120-pound sacks.

The Colorado Potato Warehousing Corporation, organized in June, 1925, is a subsidiary of the Exchange. This corporation has a capital stock of \$250,000, and the same officers as the Exchange, with W. F. Heppe as manager. The object of the subsidiary is to handle the leasing, purchasing or construction and operation "of warehouses, farms for seed purposes, by-products plants, factories or other places for handling any potatoes delivered by members of this or other associations." The "Colotato" pack is produced in the warehouses.

Warehouses are operated under ownership or lease at Del Norte, Center, Monte Vista, Hooper, La Jara, Bostwick Park, Montrose, Olathe, Delta, Galeton, at Loma and Mack in the Fruita district, and in Morgan County. Only three of these are used for storage, the growers almost invariably having farm storage. The warehouses are used for grading and packing.

BORROWED TWO AND A HALF MILLION.—The Exchange arranges for its finances through one Denver bank and its total borrowings for the last year were \$2,512,965.02. Loans are made on bills of lading and the money is used for advances to the growers on the pools. A revolving cash reserve fund of approximately \$100,000 is maintained at all times, this being created by a deduction of not exceeding two per cent from gross sales. An advance of 75 per cent is made to growers on delivery of potatoes at loading station and final payment is made in 30 days. Pools are on a weekly basis, by grade, variety and quality. Seven standard varieties are recognized, these being Russet Burbank, Red McClure, Brown Beauty, People's Russet, Rural New Yorker, Irish Cobbler and Bliss Triumph, with some minor varieties of which not many are grown.

Shipments last practically eleven and a half months, the early potatoes coming on the market in the Fruita district of the Western Slope the latter

part of June and late potatoes of the previous season's crop often being shipped up to June 10 and 15.

The last two seasons the Exchange has handled its own sales. It also handles all claims, routings and car diversions, having its own Traffic Department. The Field Service Department has management of the warehousing corporation, the production of the special brand, inspection, organization work, membership relations and issuance of the monthly paper, *The Colorado Potato Grower*.

EXCHANGE BUYS FOR GROWERS.—The purchasing feature of the Exchange is growing in volume. In the season ending June 30, 1924, sacks, twine, seed, et cetera, bought for members amounted to \$81,483; in the season of '24-'25, \$179,109, and for '25-'26, the amount was \$237,947.

The total figure for sales for the year 1925-6 has already been given, namely \$6,400,000. For the season ending June 30, 1924, it was \$2,811,365; for the season ending June 30, 1925, \$2,226,838, this being a year of low yield, due to poor crop conditions.

The contract between the grower and his local and the Exchange runs for five years, the one at present in force covering 1923 to 1927 inclusive. It requires the Association to buy and the grower to sell and deliver to the Association "all of the potatoes produced or acquired by or for him in Colorado during" the years above specified. The contract is a mutual one between all members. It carries a provision for specific performance and a clause for liquidated damages in case of a breach. The member conveys all title to his potatoes to the Association and the Exchange.

UNITED FRUIT GROWERS*

The United Fruit Growers Association of Palisade, Colorado, was the first organization incorporated under the new Co-operative Marketing Act of 1923, with the following officers and directors: J. D. Reeder, president; Frank T. Hatter, vice-president; A. M. Echternach, secretary-treasurer; H. G. Crissey, manager. Directors: J. D. Reeder, F. T. Hatter, A. G. Tilton, J. H. Cutter and W. J. Stebbins. The present officers (June, 1926) are A. F. Martin, president; J. G. Morgan, vice-president; A. M. Echternach, secretary-treasurer; H. G. Crissey, manager. Directors: A. F. Martin, J. G. Morgan, J. H. Cutter, G. W. Bowman and P. H. Cramer.

J. D. Reeder resigned from the presidency in the fall of 1923 on account of living in California each winter. Frank T. Hatter served as president for two years, resigning in the spring of 1926, having become disqualified to serve when he sold his ranch.

*Information furnished by A. M. Echternach, Secretary-Treasurer United Fruit Growers Association.

This organization started with 195 members. Today there are 230 accounts. Several members were lost by selling their places. Three members withdrew after the second year. The association started without capital, except growers' notes. Extensive platform, warehouse and trackage facilities were constructed. These improvements were paid for the first year by charging growers three times the regular package charge instead of borrowing money until earnings amounted to enough to pay for same. One-third of this charge was returned each of the first three years, with interest, and then the association had \$38,500 as a working fund, each member receiving all of his original investment with interest. This method established a credit that is the basis of successful business.

The Association expected to borrow \$80,000 for about four months in 1926 to buy the supplies necessary to handle the 800 cars of fruit which it was anticipated would be shipped. In 1925 there was a short crop, 440 cars being shipped. This is about 65 per cent of the output of this district.

This organization uses the Federated Fruit and Vegetable Growers, Inc., of which they are a member, as their distributors of carload lots. Peaches are distributed all over the United States and some cars go to Canada.

Although members sign a contract to deliver all their crop to the organization, the manager is lenient in enforcing this clause. In case a buyer offers more than market price the manager advises the grower to sell, the grower, however, paying the regular package charge to the association. This prevents outside interests from creating dissatisfaction by offering more than they can afford to pay, thinking the grower cannot accept his offer on account of his contract.

Co-operative marketing depends on several things. First is loyalty of the member and a willingness on his part to do his share without any favors, and a willingness to submit to some things that may not be exactly to his liking. He must surrender some of the independence he prizes so highly, for the good of himself and others.

It is necessary to have an efficient board of directors and manager—men of business ability and diplomacy, and unquestioned honesty.

Benefits accrue, not so much from prices received as from establishing dependable grades that command a better price, and also a saving in handling business on a large scale. All profits eventually revert to members according to the amount of business done through the association.

COLORADO WHEAT GROWERS*

The Colorado Wheat Growers Association finished its first five-year period with the end of 1925. While the Association has been successful in demonstrating the value of orderly marketing, through compulsory pooling, the five-year period was largely experimental. Out of this experience has grown a new plan becoming operative in 1926, calling for a ten-year marketing agreement. Under this plan members will be permitted to withdraw from the Association any year after the delivery of one crop, provided due notice is given. The sales of the organization will no longer be made jointly, but will be handled through a joint selling agency, established by the wheat pools of Colorado, Oklahoma, Kansas and Nebraska. This agency, known as the Southwest Wheat Growers, will give Colorado growers the advantage of membership in a large and powerful pool. The expectation was that this pool would handle twenty million to thirty million bushels of co-operative wheat grown in 1926.

At the time of the organization of the Colorado Wheat Growers in 1920 few farmers knew much about pooling. However, in the Pacific Northwest a group of wheat growers had developed the plan quite successfully. In that year Kansas wheat growers became interested and formed a pool which handled a limited quantity of carloads for individual growers. In that year also the National Wheat Growers Association of Kansas was organized. This association sent two members to Colorado in the fall and meetings were held at Akron, Wray and Yuma. As a result, a state committee was formed in Colorado for the purpose of interesting wheat growers in the new idea. J. E. Miller of Brighton was made chairman of this committee because of his familiarity with co-operative marketing through connection with the Brighton Cabbage Growers. Other members of the committee were: E. O. Smith, Harvey W. Weeth, J. M. Delander, George W. Atkinson, J. C. Burns, George J. Fisch, A. E. Fox, F. W. Gilliland, A. P. Hart, M. L. Hayworth, J. H. Heist, R. M. Jones, Claude Laycock, Roy E. Owens, A. B. Parish, George Rudel, E. J. Simpson, O. F. Sarsfield, Z. W. Wagner, and J. H. Wilterdink.

Wheat marketing propaganda through the winter spread the idea among farmers so that when the Kansas representatives returned in March, 1921, a rousing meeting was held in the courthouse at Akron. A plan was outlined by which three million bushels of grain were to be signed up in Colorado. Forty-five contracts were signed at the meeting, each signer paying his \$10 membership fee. Dozens of workers went out into the country and a lively campaign followed. However, the final results were disappointing.

*This summary of facts about the first five-year period of the Colorado Wheat Growers Association is based on information gleaned from annual reports of Bruce Lampson, General Manager, and obtained from Val Sherman, Editor of the Colorado Wheat Grower.

As only 750,000 bushels had been signed up by July 1, the pool could not operate. This discouragement floored the officials of the young organization. But it was also a valuable lesson. They had learned the necessity for centralized control. Nothing had been accomplished but the creation of favorable sentiment among groups of farmers.

New heart was put into the movement in March, 1922, when a meeting of the Northwest Wheat Growers and the Southwest Wheat Growers was called to be held in Denver. Two Colorado representatives, Harvey Weeth and A. B. Parish, attended the Denver conference. All of the other wheat pools of the West were represented at the meeting, including Washington, Oregon, Idaho, North Dakota, Montana, Oklahoma, Texas, Kansas and Nebraska.

An outcome of this conference was the organization of the American Wheat Growers Associated. Colorado was given representation and Harvey Weeth was appointed president of the Colorado Association at a meeting in Sterling, April 1, 1922. Twelve men attended this meeting and discussed the possibility of making another effort in behalf of Colorado. They found their balance sheet the most discouraging obstacle, the liabilities being about \$1,000, with assets of \$1.85.

In spite of the discouraging financial situation, it was decided to make an effort to sign up the remainder of the 750,000 bushel minimum necessary before a pool could operate. A. B. Parish was put in charge and agreed to make the attempt. The members present chipped in at the rate of \$10 each and later several signed personal notes in order to raise cash to continue the work of signing up for the pool. The goal was reached July 16 and the first pool of the Colorado Association was then a reality.

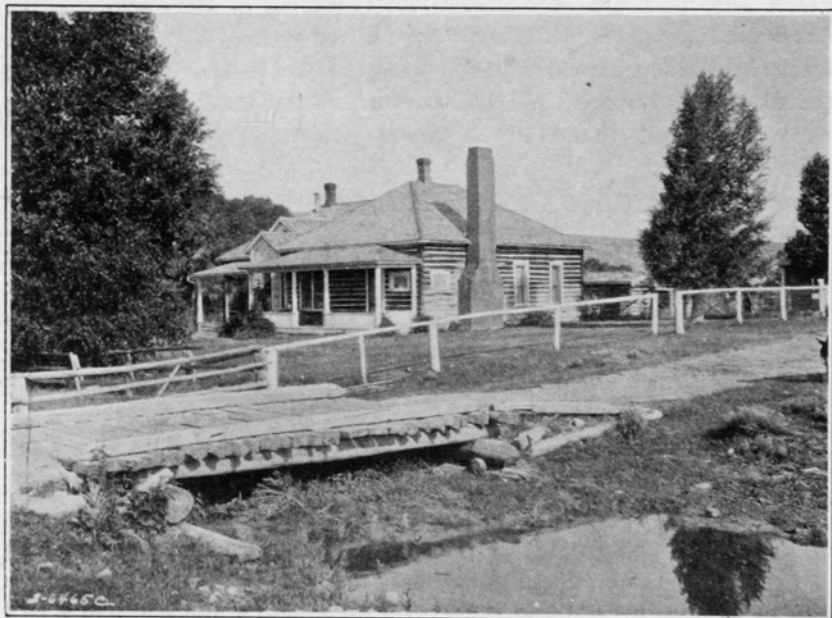
MANY SETBACKS OCCUR.—Some difficulty was experienced in preliminary financing of this pool. A loan of \$500 was made by the Northwest Wheat Growers to meet running expenses. Some of the firmest backers of the movement again came to the rescue and agreed to ship their wheat on deferred payments. Some of this wheat was sold and the money so realized was used to make advances to other members. A serious car shortage had developed by that time and this caused another setback in plans. The Association had made arrangements with six elevators to receive Association grain. However, when the car shortage was lifted and wheat began moving at a good rate all of these elevators were filled to the brim and they could accept no grain. The situation remained critical until the first of November. At that time the Association managed to obtain a few cars and ship some wheat.

However, just as the difficulties of financing and car shortage had been lifted, another blow fell that almost wrecked the Association again. The

bank where most of the Association's funds were carried closed its doors. It was the third almost insurmountable difficulty that the new Association had suffered in one season. However, this, too, was overcome and the first pool of 90,000 bushels was finally closed at an average price of 86 cents for No. 1 wheat.

The 1923 pool comprised 1,250,000 bushels and sold on a declining market.

In 1924 the Colorado Wheat Growers Association handled 1,191,500 bushels of wheat. The average price for all grades and varieties of the pool for the whole state was \$1.10 per bushel. The average price of the state



A modern log house, residence of Ino Hontholtz, Glendevy, Colorado.

that non-members received was 99 cents. The members of the Association delivered 75 per cent of the pool by October 1, or in round numbers, about 950,000 bushels. Of this amount 400,000 bushels was stored for sale during the latter part of the year at the higher prices. This accounts for the gain in the pool of about 11 cents over the average outside price.

The Association attempted an orderly marketing program, but because of lack of support it could not be fully carried out. At the beginning of the season the directors estimated there would be delivered to the pool at least two million bushels. Later it was found that many growers had violated their agreement and that, instead of receiving two million bushels,

the pool would amount to only 1,200,000. It was pointed out in the annual report of General Manager Bruce Lampson, covering the 1924 pool, that had this 800,000 bushels short been delivered to the pool, instead of being sold outside, it would have been stored and sold during the latter part of the year at an average price of \$1.50. This additional wheat would have added to the pool \$320,000.

Out of this experience with contract violation came the changes in policy already mentioned and the new ten-year plan, with permission to withdraw any year after delivery of one crop, providing due notice is given. The Association had approximately 5,800 members at the close of 1925. The members of the board of control at the beginning of 1926 were: E. E. Cronquist, Haxtun; H. J. Weeth, Peetz; Alfred Weller, Willard; Dr. O. E. Webb, Milliken; Charles W. Hake, Lafayette; R. L. Martin, Keenesburg; Joe Plummer, Akron, C. W. Parson, Burlington; J. M. Jackett, Genoa; W. A. Macpherson, Lamar; C. L. Hover, Longmont.

COLORADO HONEY PRODUCERS*

The Colorado Honey Producers' Association, while not operating under the marketing statute, is co-operative in principle. It was organized under the corporation laws of Colorado on January 4, 1899. At the beginning the corporation had an authorized capital of \$10,000, the shares having a par value of \$10 each. At the end of the first year the new corporation paid a dividend of 85 per cent!

This first extraordinary dividend was the last of its kind. The Association was promoted by men who believed in the co-operative principle; it was organized and officered by men and women who believed firmly in that principle; and ever since, it has been permeated and dominated by that principle. And yet—so powerful is the "dividend" tradition—at the close of its first year of business the association paid a dividend that would have been a credit to the typical soulless corporation. The believers in the Rochdale idea succeeded in so amending the constitution of the Association that dividends were limited to 10 per cent, with a provision for distributing surplus in proportion to the amount of honey and wax sold through the association by its members. After this the business paid regular 10 per cent dividends until 1915, when the rate was reduced to 8 per cent; and then, in 1919, it was provided that half of the 8 per cent dividend should be set aside as a building fund.

The Association began operations with the following named men as its board of directors: J. B. Adams, Longmont; R. C. Aikin, Loveland; V.

*From article by D. W. Working, in *Western Farm Life*, 1923.

DeVinny, Villa Park; J. N. Pease, Littleton; W. L. Porter, Denver; Frank Rauchfuss, Denver; Herman Rauchfuss, Elyria.

Mr. Porter was the first president and continued in office sixteen years. He was succeeded by George Miller of Littleton, who has served ever since. The original manager is still in charge of the business.

On December 28, 1909, the articles of incorporation of the Association were amended to increase the capitalization to \$20,000; and on March 24, 1914, the capital stock was authorized increased to \$50,000. But the Association had been proceeding cautiously. At the first the manager continued to work for Mr. L. A. Watkins, who kept a line of beekeepers' supplies in his store on Wazee Street. A warehouse was rented at \$40 a month during the honey marketing season for two years; and one day a week this warehouse was kept open to receive honey. From this place the local demand was supplied and cars were loaded for shipment to eastern markets. It was this careful management that permitted an 85 per cent dividend the first year and liberal rebates in subsequent years.

In 1902 the Association was sure enough of itself to open a store and to put in a stock of beekeepers' supplies. Ever since it has been continuing the policy of conducting two lines of business—(1) selling bee products for its members on commission, and (2) selling beekeepers' supplies to its members and anyone who might choose to purchase. Thus the business has been comparatively simple.

The fact has been stated that dividends were limited to 10 per cent after the first year and the additional fact that the profits of the business were distributed in the form of rebates based on the amount of products sold by members through the Association. Even this plan was found to have its disadvantages. It was not easy to sell stock to members who could not hope to receive more than 10 per cent on their money; and the Association needed money to run its growing business. To illustrate a disadvantage of the Association, the manager said:

“A certain member owned one share of stock, which cost him \$10 and entitled him to all of the privileges of the Association. One year his rebates amounted to \$195.70 and his dividend to 80 cents. Another year the same man received the regular dividend of 80 cents, but his rebate amounted to \$547.63. Of course, this was getting too much out of an investment of \$10.”

Experiences like this led to an arrangement by which members received half of their rebates in the form of stock. So it came about that, when the corporation had to be reorganized at the end of its first twenty years, the par value of the stock was increased to \$50 and the total capitalization to \$100,000. This was on July 19, 1919. It was a fortunate year for expansion. For in 1918 the Association had made its great “killing”—paying

each and every member a rebate amounting to 80 per cent of his sales through the Association. This was the more remarkable because, in 1915, the Association reduced its commission rate from 10 per cent to 5 per cent. As an indication of the amount of business the Association did for certain of its members, the manager points out that in 1918, in spite of the low commission rate, the sum of \$929.55 was paid to one member in the form of rebates. Besides, the member received his dividend at the rate of 8 per cent.

The Colorado Honey Producers' Association is now twenty-seven years old and has been financially successful from the beginning. The loyalty of the members to their Association and its co-operative ideal, accounts in part for the success of the business. The permanence of the management accounts in part for the confidence of beekeepers and business men in the business.

The fact that the Association began in a small way and kept down overhead expense—even at the cost of requiring its officers to work for nothing and its regular employees to work for small pay—accounts in part for the success of this co-operative association. Officers and directors in 1926 were: Geo. Miller, president, Littleton; Frank Rauchfuss, secretary-treasurer, Denver; C. H. Wolfe, vice-president, Greeley. Board of directors: L. W. Howsam, La Jara; Geo. Miller, Littleton; Harvey Said, Pueblo; M. Cantonwine, Longmont; Frank Rauchfuss, Denver; C. H. Wolfe, Greeley; F. G. Rauchfuss, La Jara.

MOUNTAIN STATES BEET GROWERS' MARKETING ASSOCIATION*

The motive prompting the organization of the beet growers into an association has been the feeling of the individual beet grower of his inability to deal effectively and fairly with the highly organized sugar company. It practically amounted to the company making the price independent of the grower, buying the beets at such a price as will enable them to get sufficient quantities to operate their factories. The beet grower selling his crop at a price fixed by the buyer and seeing the evidences on every hand of great profits made from his crop, there naturally grew up in his mind a spirit of discontent and dissatisfaction with the company. This discontent finds expression in investigations made by the Government. One of the opening statements made by the Federal Trade Commission in the sugar beet investigation of 1917 is that they were undertaking to do this in compliance with requests of beet growers, who claimed that they were not being paid a price commensurate with the profits of the sugar companies.

*History of Mountain States Beet Growers' Marketing Association prepared by Mr. J. D. Pancake.

The growers have felt that there is but one arm of defense and that is to form a combination or association, giving it supreme power to deal with the company and depriving the individual of all his rights in bargaining and vesting them in the association.

In the earlier days there was no law permitting such a combination, and the Association had to rely on the fidelity of the growers to restrain themselves from undertaking to bargain separately.

In 1918 the Mountain States Beet Growers' Association was incorporated. It could not under the law, at that time, contract with the grower, making itself an exclusive agency. This organization did much in educating the grower to realize his position as compared to that of the company's; in representing to the Washington government the condition of the beet grower; in obtaining the investigation of the Hoover Commission, resulting in a price of ten dollars per ton for beets. Numerous other advances are directly traceable to the efforts of this earlier Association. Its weakness was not in itself, but for lack of legal authority in making contracts with its members.

On February 28, the Great Western Sugar Company had assets of eighty and one-half million dollars and had grown from six factories to sixteen and reserves of thirty-eight million dollars. Since the organization, they have paid 7 per cent on the preferred stock and on May 31, 1924, they had paid dividends on common stock amounting to \$37,508,177 in cash and \$4,428,500 in common stock. At this date a share of common stock, par value \$25.00, is worth about \$100.

KNEW PROFITS OF FACTORIES.—These profits being well known, the beet growers under the new co-operative marketing law passed in 1923, organized the Mountain States Beet Growers' Marketing Association, making the organization the sole agency in bargaining with the sugar company. This Association controls the marketing of the beets grown on about 120,000 acres of land in the Great Western territory of northern Colorado out of about 175,000 available acreage. The contract between the Association and the growers provided that the sale of the beets to the sugar company should be on a fifty-fifty basis.

This was the first time in history that the grower had participated in the sale of his crop of beets. The contract entered into between the Association and sugar company was upon a fifty-fifty basis as determined by ten years' averages. This was for the season of 1924. Upon the consummation of this contract, the manager of the company stated that if this contract had been in effect during the last twenty years the company would have paid the growers \$21,000,000 more for beets. The contract entered into caused the largest crop in the history of the industry in this territory,

resulting in the production of 8,500,000 bags of sugar, or 40 per cent of the entire output of the beet sugar in the United States.

Owing to the advanced costs of production, the officials of the Association felt that for the season of 1925 advances in price of beets should be commensurate with the increased production costs, and further, the financial statements of the sugar company for the last two years showed net earnings of \$12,000,000 for the year ending February 28, 1924; and net earnings of \$10,500,000 for the year ending February, 1925. A protracted discussion ensued, until March 31, 1925, when a contract was entered into making the initial payment \$6.00 instead of \$5.50.

GROWER APPEALS TO COURT.—Before the negotiations were completed for the season of 1925, Henry Wagner of Sterling sought release from the terms of his contract, to enable him to contract with the officials of the sugar company individually. This being denied, he sought this release by appealing to the court. If he had been granted this release with others, they would have lost the gain in obtaining fifty cents more in the initial payment.

The court, on March 31, 1925, granted this release to Wagner on the grounds that the Association contract with its members is in restraint of trade, contrary to public policy, and null and void.

The Association at once appealed to the State Supreme Court, and on March 1, 1926, the court reversed the lower court and announced that the Association contract was legal and of full force and effect. At this juncture the Great Western Sugar Company announced that they proposed to aid Wagner in every proper way to the end that a full determination of the scope of the contract might be ascertained.

Wagner asked for and received a rehearing of the case.

Upon this rehearing the court announced that as the case was brought for the season of 1925; as all grievances for that year were past; and as there was nothing on which to place judgment; the case was moot. In other words, nothing before the court. This was June 15, 1926.

The attorneys of the Association asked for a rehearing on the grounds that the court was acting on the assumption that Wagner did not raise beets in 1925, but he did. As he did raise beets, there were certain live issues growing out of the contract itself, such as an agreement to pay the 2 cents dues and liquidated damages. The court denied the rehearing on July 6, 1926. There is now no litigation pending.

According to the best opinions, this leaves the Association in a very good shape—one in which a hypothetical or mooted case has been carried through the court and won. It has been expensive and no individual is likely to bring action, knowing the long and expensive line of litigation.

AN EIGHT-DOLLAR MINIMUM.—While this case was in the courts, the Association negotiated the 1926 contract. This was a decided advance over former contracts. The minimum price was \$8 per ton. The original fifty-fifty basic scale was retained. A new principle recognizing quantity production was introduced into the contract. The reason is this: The greater production of beets necessitates greater freights, as the grower participates in paying the freight. The sugar of the larger crop has to be shipped to greater distances.

To remedy this a bonus of one cent per ton of beets is paid on each 28,000 bags of sugar produced in excess of 4,200,000 bags limited to Colorado. This bonus stops at fifty cents. If the scale should fail to make the \$8, then such part or all the bonus, or deferred payments, may be applied to make the \$8.

The Sugar Company incorporated in their contract with the growers that for growers or tenants of growers who were members of the Association on September 1, they would take out 2c per ton and pay this amount to the Association.

To ascertain the gradual increase in the price since the season of 1922, we will make a comparison of the prices paid for a 15.5% beet and sugar selling at net \$6.00. A ton of beets on these conditions in 1922 was priced at \$6.76, minimum \$5.00; in 1923, \$6.97, minimum \$5.50; in 1924, \$7.50, minimum \$5.50; in 1925, \$7.50, minimum \$6.00. In 1922 the grower received 44%; in 1923, 46%; in 1924, 49%; of the net money from a ton of beets.

The territory embraced by the Association is from the Rockies on the west to the Nebraska line, from Denver on the south close to the Wyoming line.

At times, almost without funds, the Association has sought to educate the growers, secured the influence of the federal and state governments and secured for the growers directly and indirectly millions of dollars more for their crop. As one reviews the work, he can hardly see where the Association could have accomplished more, taking into consideration the task and the means for its accomplishment.

The officers for the year 1926 are: W. E. Letford, president; Fred Cummings, vice-president, and J. D. Pancake, secretary and treasurer. The Directors are: Fred Cummings, Fort Collins; Oliver Chandler, Fort Collins; Dr. G. E. Nelson, Windsor; S. K. Clark, Lucerne; Wm. A. Carlson, Greeley; Ralph Clark, Eaton; Henry Strom, Loveland.

THE FARMERS' EDUCATIONAL AND CO-OPERATIVE UNION
OF COLORADO*

Among the farm organizations of Colorado, or of those of national scope the Farmers' Educational and Co-operative Union stands out prominently in farm organization history, for its marvelous accomplishments, fundamental stability, permanency and fearlessness. It has rarely, if ever, failed to place itself definitely on the side of farmers and the common people on every question that pertains to the public weal. The history of the Farmers' Union is replete with accomplishments. Its career has not been meteoric, but it was founded with the idea of permanency, and, evidently, with the knowledge that the economic battle of agriculture was a battle of the ages, rather than issues that could be settled definitely in a year or so of time.

The first Local Unit of the Farmers' Union was organized at Smyrna School House, Raines County, Texas, on September 2, 1902. The infant organization naturally had difficulty in even crawling during the early months. The mortgage holders, the long credit merchant, the politician and the weak-kneed farmer brought out their little hammers and knocked. In spite of this opposition and skepticism, the idea would not down, because it was fundamentally sound. Soon calls came from all directions for organizers. The youngster began to show its strength. In 1903 the Farmers' Union, as it was called, made a contract with the ginners of Raines County and saved to the farmers more than \$6,000. Farmers through the South heard of the organization and began to make inquiry. Organizers were commissioned and sent into Arkansas, Oklahoma, Mississippi, Indian Territory, Louisiana, Alabama, Georgia and Missouri.

Delegates from local unions met at Mineola, Texas, February 14, 1904, and organized the Texas State Union with N. C. Murray as its president. In June of that year President Murray presented to the Board of Directors of the State Union, his plan for withholding from market one bale of cotton in five and to market the remaining four slowly. This was not only the first cotton holding movement, but was the first attempt, so far as we have record, by any considerable group of farmers in America to market a product in an orderly manner. The movement spread throughout the South and resulted in an estimated saving to farmers of more than two hundred million dollars.

The flattering results of the initial movement to control marketing, thoroughly convinced the leaders of the Farmers' Union that co-operation in its various phases, was indeed the key to the situation. The Texas State

*This sketch touching the main facts regarding the history of the Farmers' Educational and Co-operative Union of Colorado, prepared by T. E. Howard, Secretary-Treasurer.

Union so conducted the campaign that soon each of the southern states boasted a state organization. It became increasingly apparent that the agencies being utilized by cotton producers to better their conditions could be applied with equal success to the problems of the grain and livestock grower, and the general farmer as well. This led naturally to the formation of a National Union.

Delegates from Texas, Arkansas, Oklahoma, Alabama, Georgia, Mississippi and Louisiana met in Texarkana, December 5, 1905, and organized the National Organization of the Farmers' Educational and Co-operative Union of America. The constitution adopted by this body was substantially the one drawn up by the original incorporators and is the one now in use by the organization with some slight changes which have seemed necessary as the movement expanded.

ENTERED COLORADO IN 1907.—The Farmers' Educational and Co-operative Union did not make its appearance in Colorado until 1907, and after sufficient local unions had been organized a state convention was called on March 11, 1908, and the following officers were elected:

President.....	Geo. B. Land	Conductor.....	C. P. Larsen
Vice President.....	Horace Meloy	Doorkeeper.....	Geo. O. Coston
Secretary.....	H. S. Stovall	Director.....	W. J. Hood
Treasurer.....	A. S. Manning	Director.....	Fred Light
Statistician.....	J. W. Vandeventer	Director.....	Lee Clark
Organizer.....	J. S. Dunn	Director.....	F. I. Urquhart
Chaplain.....	C. V. James	Director.....	W. R. Callicotte

At this time the Farmers' Educational and Co-operative Union of Colorado was chartered and incorporated and set forth its purposes as follows:

Educating the farming class in scientific production, systematizing, marketing, organizing and chartering subordinate Unions, initiating members and collecting fees therefor, bringing about closer business and fraternal relations between the producing classes and to co-operate with them in the better protection of their interests. Also for the purpose of buying and selling livestock and all farm products and to do such other things and perform such other services under the law, as will promote the general welfare and secure equity and establish justice.

Changes in personnel of the officers of the Farmers' Union of Colorado have a number of times changed the policy of the organization. The first group of officers believed that a chain retail store system would be the groundwork on which agriculture could be made more remunerative, by virtue of savings made on the price paid for supplies for the farm. This plan was eventually considered by succeeding officers as being inadequate, if farmers were to receive the cost of production for their products. Eventually the chain store system, after various stages of development, was discontinued.

USED ROCHDALE SYSTEM.—Succeeding officers believed that the local units of the Union itself should own and operate co-operative elevators for the purpose of handling grain from the farm and carload commodities to

the farm. The Rochdale system of co-operation was the basis on which a great number of such elevators were organized and operated, on account of varying changes of officials, lack of business acumen and development of local leaders, a number of these elevators have been discarded, sold, or have discontinued business. It is needless to call attention to the fact that the co-operative elevator system has saved to the farmers millions of dollars, and has been the groundwork and forerunner of better, deeper and greater thought and activities on the part of farm organizations.

The Farmers' Union of Colorado, through its influence in the legislature in 1913, secured the passage of a Mutual Insurance Law which has been amended from time to time and now enables them to operate the Farmers' Union Mutual Protective Association in any county in the state. This is a mutual insurance association whereby they have a greatly increasing amount of fire and lightning insurance of their own members at actual cost to the members. On January 1, 1926, they had in force approximately \$15,000,000 of such insurance. This law has enabled them to incorporate and operate the Farmers' Union Mutual Hail Protective Association, whereby they insure their members' crops against hail at cost. They operate successfully a number of Farmers' Union Co-operative Livestock Commission Companies, one of which is located at Denver in the Union Stockyards and the measure of success to which it is attaining, is justification for every stockman in the state to take cognizance of the fact that co-operative livestock marketing is with us to stay.

Since the organization of the Farmers' Union of Colorado, no legislature has convened or adjourned without the legislative committee of the Farmers' Union being in attendance and having their part in the shaping of all legislative measures which in any way affect agriculture or agricultural organizations.

MOTTO OF THE UNION.—One of the outstanding mottoes of the Farmers' Union of Colorado is, "To the producer belongs the product of his toil." The Farmers' Union of Colorado has always maintained a militant and aggressive attitude in defending the farming class against discriminatory legislation and indeed its direct responsibility for agricultural legislation can not be over-estimated.

One of the proud possessions of the Farmers' Union of Colorado, is a picture showing Governor Wm. E. Sweet at the close of the 1922 legislature, presenting the present State Secretary of the Farmers' Union, with the fountain pen with which he had just signed the co-operative marketing act. The said act has been taken into many of the courts of the state. It has withstood violent opposition from various opposing interests, and is looked on by the Farmers' Union of Colorado as being an "enabling act"

whereby farmers may pool their crops and properly conduct commodity marketing.

The Farmers' Union of Colorado has been largely instrumental in bringing about a consolidation of all farm organizations in Colorado, to the end that farmers may in a unified voice and by unified acts, take further steps towards the establishment of an equitable distribution of the products of labor.

The officers of the Farmers' Educational and Co-operative Union of Colorado in 1926 were:

President.....	E. E. Cronquist	Director.....	Dr. O. E. Webb
Vice President....	Murray W. Bennett	Director.....	E. A. Backus
Secretary	T. E. Howard	Director.....	A. J. Hadley
Treasurer.....	Worthy Russell	Director.....	W. P. Jones
Conductor.....	Earl Kimber	Director.....	C. F. Zeigler
Doorkeeper.....			

THE FARMERS' EQUITY UNION*

From the beginning of time, man has shown a tendency for group activities. At first, perhaps, in the primitive times not only for protection against savages and the beasts but from an unconscious need of inter-communication; the exchange of thoughts and things. From this crude beginning sprung trading and bartering of the early days in our own country and out of this developed the economic system which governs our commercial world today.

The Equity Union Coal and Mercantile Company is patterned after the same ideas and is not unlike the research bureau of any company sufficiently large to maintain such a department in their organization. It should not appear strange that the farmer should feel the need of a source of, business advice from accurate knowledge, since his own time and money, too, are spent in acquiring the knowledge that every true agriculturist seeks, that of treating the soil in a righteous manner and with intelligence, so that it will best deliver the products needed, not as seed was once stuck in the ground and allowed to grow as it would, but in such a manner as to grow a better wheat, a better corn, or better oats than have heretofore been known. It is not physically possible for the agriculturist to do this and at the same time study market conditions and better business methods in the same ratio as does the merchant of today. But the farmer needs this information just as badly. He needs to know not only what the need of the world is but what is the more sensible "buy" when he is considering his own needs.

This need was felt some years ago by Mr. C. O. Drayton, a man of vision and practical purpose, who was the president of the American Society

*Historical sketch on Farmers' Equity Union, prepared by Kyle Melick of Denver, Manager of the Equity Union Coal and Mercantile Co.

of Equity which was merely a membership proposition. There was no provision for capital but, with his idea in actual operation it was soon seen that there was a need for providing ways and means for owning and controlling elevators and providing a group head to assist in the marketing of products and fostering harmony among the members of the organization. Thus the Farmers' Equity Union came into existence and from 1911 to 1920 some 50,000 farmers in fifteen representative states in the central western section of the United States became thus organized, with small groups in each community furnishing sufficient capital to own and operate their own business, with facilities of capacity to take care of the production of the group. This plan operates successfully and permits the farmer to have available such information and means as to more economically dispose of his products.

But the numerous heads of these groups which were in the neighborhood of five hundred in number, were unable to secure the knowledge, such as a central organization as the Equity can procure and make available to them, and they in turn can convey to their individual members. The Equity Union Coal and Mercantile Company is, therefore, a condensation of these memberships. While its stockholders are agriculturists belonging to these various groups in this territory, it is not primarily, an organization for profit, but for service. It will be shown further in this article how the organization can be developed into a profitable one.

Denver, with the accessibility of the coal fields, the advantageous railroad facilities and the diversified nature of its surrounding country, making for a wide range of interchangeable products, became the logical seat of activities.

FARMER-MINER TEAM WORK.—In dwelling upon our primary purpose—service—let us follow the processes we pursue with reference to coal. It is a well known fact that the coal miner is a seasonal worker, due to the lack of demand in the summer months. The increased cost which must necessarily be affixed to the price of coal, should sufficient storage space be provided to handle coal mined during these months, forces cessation of operations. The miner, thus unemployed, often enters the commercial world, already crowded, for which he, a specialized worker, is not fit, but resorts to this entry since he and his family must be fed and taken care of in some manner. Due to his lack of employment, or to decreased income due to misfit employment, his wants are curbed and he becomes a reluctant consumer, except for actual necessities. Now, if the demand for coal can be continued through these months it will not only benefit the miner but will stabilize the coal mining industry in making more uniform conditions and permit of more stable prices. Benefiting by this knowledge, the mem-

bers of various Equities combine their anticipated need and, whenever it is economically possible, store their coal in the summer months for distribution when actually needed. The farmer thus enlarges the market for his own products by assisting the miner to keep steadily employed and retain his standard of living, whereby he makes more use of produce than under the cramped conditions of seasonal labor.

DISTRIBUTION OF FRUIT.—Another part of our activities is the aid we tend in equalizing the distribution of fruit. The Western Slope of the State of Colorado is highly productive of fruits, while the eastern part of the state is a semi-dry country and fruit is not numbered among the resources of this section. Due to the somewhat uniform climatic conditions in the fruit sections, there is a certain time of the year when the supply is large and must have an immediate outlet. The modern menus have brought us to a place where the human system requires an amount of fruit to function properly—we hunger for it and it has become an actual need. Therefore, we aim to assist in distribution of such products from one section into some other section which does not produce the same in reasonable proportions.

Now that we have touched upon the larger element—service, let us go back to the statement that the organization can be made one of profit. In order to explain this, we must first acquaint you with the mechanics of the Equity Union, as a plan has been devised whereby all possible cost of operation that can be eliminated has been. From the Denver office headquarters, salesmen formerly traveled into the territory, advising the managers of the various Equities of possible purchases and disbursing the information that had been obtained. Such orders as were placed through them must necessarily be sufficient in volume to enable the small profit thereon to cover the salesmen's expenses as well as the overhead of the Denver office.

Under the new plan, the territory is divided into districts. Outlines are drawn in respect to aptness of location of one Equity to another within the district. For instance, District No. 7, comprises those towns located on the main line of the Chicago, Burlington and Quincy Railroad from Akron, Colorado to Benkelman, Nebraska.

From among the group of managers of local Equities in each district is selected one manager who is appointed the district representative for that particular district of which he is a part. District meetings are held monthly, at which time all Equity managers within the district are called together at such time and place as is deemed most advisable by the district representative. The Denver manager is present at these meetings and general discussions are held. It is at these meetings, the needs of the various

Equitys in the way of coal and other merchandise are made known and such requirements consolidated and carload orders placed.

To expedite the action at these meetings, the district representatives from all the districts convene as often as is necessary with the Denver manager and at these district representatives' meetings, there is an interchange of thoughts, ideas and experiences as found in the several localities and, also, there is a distribution of the data that has been obtained by the Denver office, which the representatives carry to the managers of the Equitys within their district and they, in turn, pass such knowledge to the individual members of each Equity.

Now, it must be understood that while the district representatives are, in a manner, the salesmen of the Denver company, they are, at the same time the purchasing agents of the Equitys within their respective districts. Thus, they are vested with authority which enables the full attendance at district meetings or at district representatives' meetings to voice the combined buying power of the organization.

COMBINED BUYING POWER.—In exercising the combined buying power, it is possible to secure from the producer or manufacturer a volume discount, such as the merchandise jobber receives. Such discounts revert to the Denver Company and it is from the accumulation of these earnings that the expense is paid and such remaining funds that are not set aside for research work, are paid to the stockholders in dividends. The stockholder-membership of the Denver company is comprised of the same individuals who are also members of the various Equitys.

To illustrate, the one commodity salt can be made to insure a comfortable income. Salt can be bought at cost, plus a legitimate profit, that is an amount sufficient to allow for the proper functioning of the producing organization and to take care of the employees engaged in the production. At the same time, the agriculturists are saved the expense of a middleman's organization from a competitive basis, and such profit ultimately finds its way into the pocket of the farmer in the form of the service we render, or actual cash dividends. Therefore, it can be seen that with the accumulation of the necessary volume on salt and various other commodities, the financial success of the organization is secured. This is not done in any elaborate manner, but in much the same way as the United Cigar Stores and the various chains of five and ten-cent stores make their huge profits, by volume sales on narrow margin.

The Board of Directors and the Denver manager feel that no mistake is being made in concentrating all efforts on the primary purpose—service, but it is also appreciated that financial success will assure of the furtherance and enlargement of this service. Then, too, "nothing succeeds like

success" and the success of this company is surely to spread to other sections where similar efforts could produce like results and breed other such organizations. It is our hope, therefore, that we may incite inquiry and possibly be, in a manner, the seed that will grow into world-wide service of real worth to the agriculturist, and make an indelible impression upon the economic relations of the farmer of the world.

In 1926 there were ten active organizations of the Equity Union in Colorado, representing a membership of 2,000. However, there is no drawing of state lines in the organization. In the adjoining states of Kansas, Nebraska, Texas and Oklahoma, there are numerous Equity Associations with whom the Colorado groups come into business touch, these representing in the neighborhood of 20,000 farmers. The total membership for the United States is approximately 50,000.

National headquarters are located at Greenville, Ill., the national officers being: Le Roy Melton, President, Greenville, Ill.; P. L. Betts, Vice President, Chicago; and the following directors: A. Huffman, Leota, S. D.; P. J. Culler, Atwood, Kans.; John E. Kite, Bird City, Kans.; W. A. Irons, McCook, Neb.

The officers of the Equity Union Coal and Mercantile Company are: J. E. Kite, President, Bird City, Kans.; E. E. Hanna, Vice President, Wauneta, Neb.; Thor Asp, Secretary-Treasurer, Holdredge, Neb.; and the following directors: J. W. Hoot, Stratton, Colo.; R. N. Connor, McDonald, Kans.; W. E. Curry, Goodland, Kans.; T. M. Jones, Garden City, Kans.

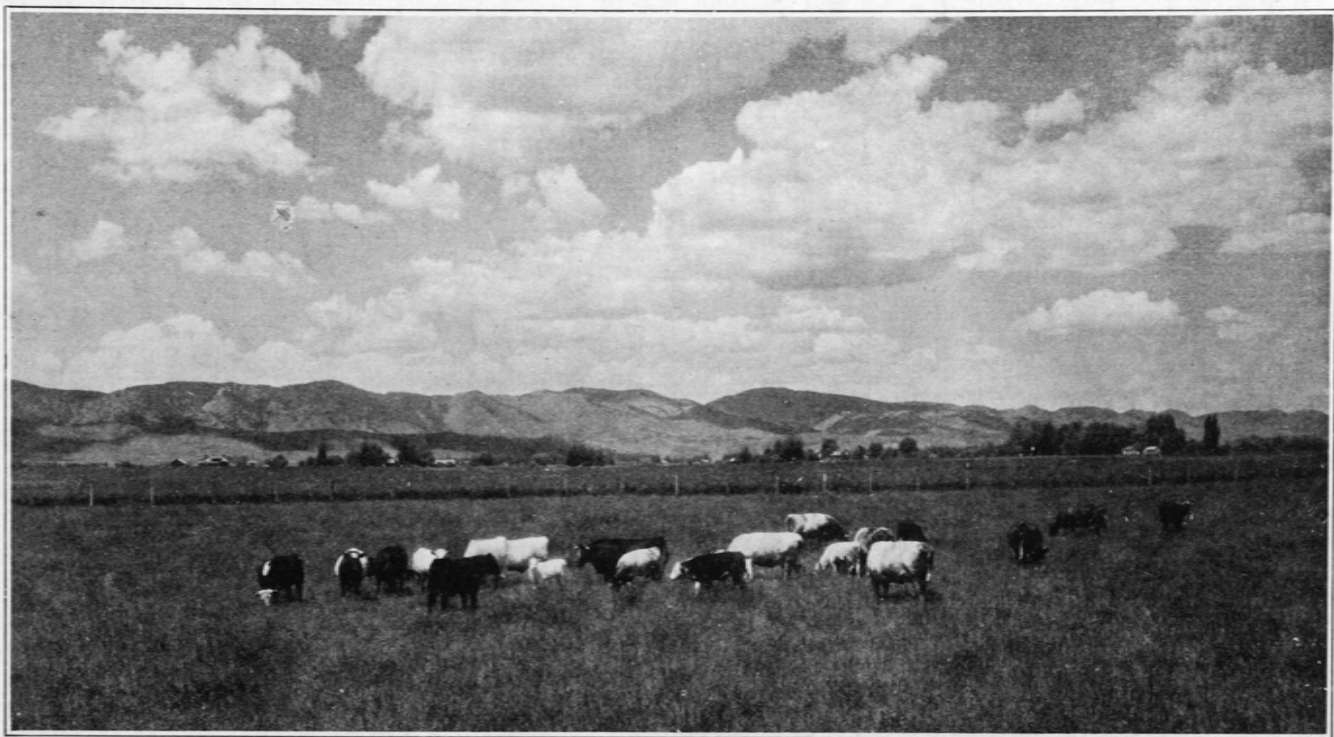
Equity establishments in Colorado in 1926 were located at the following points: Wray, Eckley, Yuma, Akron, Hyde, Schramm, Stratton, Burlington, Vona, Seibert, Flagler and Limon.

COLORADO FARMERS' CONGRESS

The Colorado Farmers' Congress was organized January 6 and 7, 1910, at Fort Collins, pursuant to a call issued by the State Board of Agriculture November 1, 1909. This call was addressed to "All agricultural organizations and county commissioners of the State of Colorado" and reasons for the organization were set forth as follows:

"The development of the agricultural resources of Colorado during the past few years has demonstrated that this industry is the most important in the state, and that the future welfare of this section must largely depend upon the intelligent efforts of those engaged in the various branches of agriculture.

"It is the desire of the State Board of Agriculture to bring about more concerted and united effort in the solution of the many problems connected



Purebred cattle on pasture at Colorado Agricultural College.

with the industry in the state, and with this object in view, a conference is hereby called, to be held at the State Agricultural College, in the City of Fort Collins, January 6 and 7, 1910."

The call outlined the plan of representation as follows: The governor was to appoint ten delegates at large; each board of county commissioners, one delegate; Colorado State Grange, one delegate at large, and each local Grange one delegate, and so on through the list of farm organizations, including the State Council of Farmers' Industrial Union, Colorado Cattle and Horse Growers' Association, Western Slope Stock Growers' Association, Western Stock Show Association, Denver and Pueblo Stock Yards, all horticultural associations, poultry, potato, seed, dairy, beekeepers, etc.

The call set forth the fact that the annual Farmers' Short Course would be in session at the time of the convention.

FIRST MEETING IN 1910.—There was an excellent response, 131 accredited delegates appearing at Fort Collins, to take part in the organization of what was called the "Farmers Conference." The conference met on the morning of January 7, 1910. James D. Husted of Denver was made president; John Morris of Golden, vice-president; L. W. Sweitzer of Delta, secretary; L. M. Taylor, Fort Collins, assistant secretary.

An advisory board was appointed, on recommendation of delegate groups from various districts, this board being composed of: Agnes L. Riddle, Denver, for northern Colorado; F. D. Johnson, Wray, Divide country; J. F. Brewer, Manzanola, Arkansas Valley; J. T. Levine, Kremmling, Moffat country; J. N. Ashby, Watson, Western Slope; R. A. Chisholm, Del Norte, San Luis Valley; W. F. Bozman, Cortez, San Juan region.

ADOPTED MANY RESOLUTIONS.—At this first session the sum and substance of results comprised a set of resolutions covering half a hundred agricultural subjects. Chief among the things recommended by the Congress were the following:

Federal and state aid for road building; commendation of the Board of Agriculture for establishing the School of Agriculture at Fort Collins; construction of an Agricultural Hall at the College; urging Congress to authorize the issue of bonds for reclamation work; commending Congress for authorizing the establishment of chairs of forestry and domestic science at various agricultural colleges; commending the legislature for establishing poultry work at Colorado Agricultural College; urging the acquirement by the state through Congressional grant of a strip of land six miles wide, from the foothills to the Snowy range, west of Fort Collins, for use of the Agricultural College for carrying on experimental work in grain growing, arid and irrigated horticulture, and urging greater development of the State's dairy industry through establishment at Fort Collins of a pure bred dairy herd, building of a model dairy barn and silo and providing equipment and literature that would aid in dairy extension.

At the second annual session in 1911, Mr. Husted was re-elected president, George B. Lang of Denver, first vice-president, C. H. Hinman, secretary.

The session was uneventful. At the third session, in 1912, endorsement was given to rural school improvement, which had recently been taken up by the Agricultural College. Commercial organizations were censured for appointing farmer delegates to represent beet growers at congressional hearings investigating the "sugar trust." The resolutions adopted by the Farmers' Congress declared that certain commercial organizations were thus encroaching upon the rights of the beet growers for an unbiased presentation of the growers' complaint against the "sugar trust."

The third session endorsed the action of the General Assembly in providing funds for maintaining the Fort Lewis School of Agriculture, which had recently been turned over to the Agricultural College by the Federal Government. That school and adjacent lands had been used by the government for Indian school purposes.

Officers elected in 1912 for the ensuing year were: E. R. Bliss, Greeley, president; C. W. Swayze, Denver, first vice-president; R. M. Haythorn, Eaton, second vice-president; C. H. Hinman, secretary.

FUNCTIONS OF THE COLLEGE.—President E. R. Bliss at the fourth annual session in 1913, gave voice to views on the functions of the college and the Board of Agriculture, some of the thoughts presented in his annual address being as follows:

For one purpose it is to get in touch with the conditions of various districts of the state and to get their viewpoint on questions that concern these various sections and the state as a whole. That in this school, the State Agricultural College, should be centered all the agricultural interests in the state. That the State Board of Agriculture should not be an executive board for the College only, but that under this board should be combined all the agricultural interests in the state.

That industrial work should be given in the school to help students, charges should be made for building plans, etc., by under-graduates. That students should have credit for laboratory work done on farms during vacation. That students should be required to keep books for the farm home. That a system should be inaugurated whereby the farmers could have a sort of exchange for their products, seeds, etc. The school should direct the thought for better conditions on the farm, for improved systems of house-keeping, etc., and country life improvement in general.

That all investigational projects should be definite. That where any change of men is necessary, these projects should not suffer through lack of continuity.

COUNTY AGENT QUESTION.—At this session the county agent question came up for discussion. R. A. Chace of Fort Morgan, a member of the executive board, declared that the farmers in his section were ready to make a start, if the college would help out with the right kind of men. Mrs. Rosepha Pulford, representing southwest Colorado, urged the need of extension work in that section and mentioned also the rural school problem. Another suggestion she made was that an experiment station be established in that section for high altitude work. This has since been done, at Fort Lewis.

Professor C. G. Sargent, then newly appointed as rural school visitor, addressed the session, pointing out the defects of the district school and

advocating consolidation. The congress indorsed Sargent's work in rural school improvement.

This session is memorable for its action in urging the appointment of a woman on the State Board of Agriculture. Mrs. Agnes L. Riddle, who had served in the State Legislature in both house and senate, was later appointed, as a direct result of the action of the congress.

It was at this session that a state law was advocated establishing supervision over co-operative marketing associations. The resolutions also urged Colorado's representatives in Congress to support pending legislation for establishment of the United States Bureau of Marketing.

A question that made its appearance frequently in the discussions was that of state coal mining, the congress approving the idea that the state should mine the coal on its own lands, for use of state institutions.

The Smith-Lever bill, through which the county agent system was finally created on a basis of joint federal and state support, was then pending in the United States Congress, and it was endorsed by the Farmers' Congress.

E. R. Bliss of Greeley was re-elected president, Lou D. Sweet, Carbon-dale, first vice-president; David McMurdo, Castle Rock, second vice-president; C. H. Hinman, Fort Collins, secretary.

At the next session, the fifth, President Bliss called attention to accomplishments of the congress, among them the appointment of Mrs. Riddle on the State Board of Agriculture. He also referred to passage of the state law coinciding with and accepting the provisions of the federal Smith-Lever law, establishing the county agent system.

A Rural School Conference was held in connection with the 1914 session of the congress.

Charles L. Hover of Longmont was elected president to succeed E. R. Bliss, the other officers chosen being John Lennox, Colorado Springs, first vice-president; R. A. Chace, Fort Morgan, second vice-president; M. N. Dillon, Fort Collins, secretary-treasurer.

SMITH-LEVER LAW.—The seventh session, 1915, heard a complete explanation of the Smith-Lever law, by Dr. Charles A. Lory. There were already eight county agents at work in the state and other counties were eagerly awaiting an opportunity to participate in the benefits of the work. Governor E. M. Ammons also discussed the subject, which loomed large on the program of the 1915 session. Charles L. Hover was re-elected president, O. F. Gardner, San Acacio, elected first vice-president, E. R. Bliss, second vice-president. The legislative committee was instructed to work for a mill levy in support of the work of the Agricultural College. It was

at this session that the first steps were taken toward establishment of the Department of Farm Economics at the college.

The first state conference of county agents was held in connection with the 1915 Farmers' Congress.

THIRTY-THREE COUNTIES REPRESENTED.—An analysis of attendance made at the seventh annual session in 1916 indicated a total registration of 377, of whom 170 were accredited delegates. The attendance came from 33 counties and the accredited delegates from the leading organizations, including 23 from the Farmers' Union and 16 from the Grange. A report was made by N. M. Dillon, the secretary, on the farm organizations, social and business, then active in the state. The list totaled 858 and in detail it was as follows:

General, Agricultural and Miscellaneous Farmers' Organizations.....	23
Institute, Fair and Show Associations.....	34
Farmers' Commercial Associations (Towns of less than 500 people) ..	101
Stock Growers' Associations	29
Poultry Associations	8
Bee Keepers' Associations	2
Fruit Growers' Associations	21
Beet Growers' Associations	1
Vegetable Growers' Associations	4
Co-operative Creameries	18
Co-operative Telephone Companies.....	65
Co-operative Insurance Companies	2
Other Farmers' Co-operative Associations.....	16
Patrons of Husbandry (Grange), Co-op.....	97
Farmers' Educational and Co-operative Union, unknown.....	
Various Associations of Country Women.....	42
Boys' and Girls' Agricultural Clubs.....	395
Total	858

Officers elected at the 1916 session were O. F. Gardner, San Acacio, president; C. L. Hover, Longmont, first vice-president; E. R. Bliss, Greeley, second vice-president; M. N. Dillon, Fort Collins, secretary-treasurer.

WORLD WAR DISCUSSED.—When the congress met January 10 to 15, 1917, the war in Europe was at its height and it was anticipated that the United States would be drawn into the struggle. The war issue came up. The first action of the congress was to endorse the Acre War-Relief plan, broached by the past president, O. F. Gardner, who was about to go to Europe for war relief work. This plan contemplated pledging the product of one specific acre of land for European war sufferers, the product to be sent at harvest time to the American Red Cross for shipment to Europe. The plan received unanimous approval and a committee was appointed to work out details, so that Colorado farmers might do their share during the next growing season in alleviating distress in war-torn Europe.

However, before the plan could be put into effect, this nation, too, was involved, and it then became a question of maintaining our own fighting forces, instead of relieving distress behind the lines in Europe.

The congress, in its formal resolutions, deprecated war and urged the establishment of a judicial body to enforce international peace. By April that resolution, too, was forgotten, not to be remembered until after the Armistice.

Other matters that came up at the 1917 session included a resolution asking the legislature to designate the State Board of Agriculture as the supervisory authority over vocational education, as contemplated under the federal Smith-Hughes law.

Officers elected were: David Halls, Mancos, president; C. L. Hover, first vice-president; E. R. Bliss, second vice-president; H. T. French, secretary-treasurer.

RURAL LIFE ASSOCIATION.—This session, the eighth in the history of the organization, was designated on the program as a meeting of the Colorado Farmers' and Farm Women's Congress and the Country Life Association. The latter group began as a meeting of rural ministers, but took up also the school and the home problems of the farm, and Boys' and Girls' Club work. The name was changed to Rural Life Conference, and as such it was a regular part of the congress gatherings for several years, always taking over the annual banquet, which was the principal social event of farmers' week. The first officers of the Rural Life Association were elected in 1917, as follows: T. J. Trammel, Platteville, president; Rev. Clark Bower, Clifton, vice-president; H. L. Seamons, Fort Collins, secretary-treasurer.

The ninth annual session of the Farmers' Congress in January, 1918, did little else than discuss the war, which was then in progress, and pledged anew the loyalty of the farmers to the government. The session was free from carping criticism of the government's food production program. The only discordant note was injected by a paid attorney representing the National Non-Partisan League of North Dakota, a political organization which was capitalizing discontent among the farmers. The record of the League in Colorado is mentioned in another chapter of this volume. The congress heard the discussion of the subject, but took no action on the League's program.

WAR PLEDGES MADE.—Resolutions adopted that related to the conduct of the war included the following:

Urge owners of land in Colorado to go to the extreme limit in holding places on their farms for Colorado soldier boys when they return from the war.

Urge the State Council of Defense to confer with the federal commissary department and the United States Food Administrator, concerning the establishment of a food product purchasing station at some central point in Colorado.

Recommend that because of the urgent demand of the government for an increase of production of wheat, sugar beets, corn and livestock, that the acreage of potatoes in Colorado be not increased over last year.

Urge the people of the state to consume home products to the greatest possible extent, instead of using luxuries.

Newton C. Dougherty of Greeley was elected president; George McCarroll, Denver, first vice-president; Edward Claussen, Carbondale, second vice-president; H. T. French, secretary-treasurer.

On account of the influenza epidemic the 1919 session was postponed from January to the end of the year, the tenth meeting being held in December. It was characterized by thorough discussions of three outstanding subjects, namely, dairying, beef production and sugar beet growing. On the latter point figures were given by the Agronomy Department of the Agricultural College, showing the cost of beet production in certain areas for 1919 to have been \$104 per acre, while the gross income was only \$100. This led to a lively exchange of opinions between representatives of the sugar company, the college and the farmers, involving beet growing costs, the price paid by the factories for beets, the use of by-products in feeding and the quantity of sugar the factories get from a ton of beets.

Beef production was discussed, both from the range standpoint and that of the feeder. Dairying was taken up, with particular attention to the problem of increasing the use of dairy products. The State Dairymen's Association met with the Congress.

Newton C. Dougherty was re-elected president; J. M. Rodgers of Wellington was chosen first vice-president; M. G. Lightner of Monte Vista, second vice-president, and H. T. French, secretary-treasurer.

NOTED MEN ARE HEARD.—No session of the Congress was held in 1920, but that of 1921, held December 6 to 9, again saw a large attendance and much interest in the deliberations. This was a speech-making session, noteworthy addresses being delivered by men of national prominence, including Senator W. S. Kenyon of Iowa and Herbert S. Hadley of Colorado, a former governor of Missouri. Kenyon's address was on national agricultural problems and that of Mr. Hadley on taxation, with particular reference to conditions in Colorado. Hadley advocated a state income tax, and the Congress approved the suggestion.

Upon the death of Newton C. Dougherty in 1922, Dr. I. L. Gotthelf of Saguache, as first vice-president, assumed the office of president and

officiated for the first time at the thirteenth session, December 11 to 14, 1922. This, too, was a memorable meeting, marking the appearance on the platform of several men of note, including Congressman Sydney Anderson of Minnesota; H. C. McKenzie of New York, tax expert for the American Farm Bureau Federation; William E. Sweet, then governor-elect of Colorado, who championed the co-operative marketing measure, which was enacted at the next following session of the state legislature. The complete record of this session is available in a digest of proceedings issued as a bulletin (Series XXII, December, 1922, No. 3). Officers elected were: Dr. I. L. Gotthelf, Saguache, president; Richard Sammons, Boulder, first vice-president; John Harmon, Pueblo, second vice-president; Roud McCann, Fort Collins, secretary-treasurer.

No session was held during 1923, but after considerable discussion the executive committee decided to try a summer meeting, setting the time for the week of July 14, 1924, which therefore became the fourteenth annual meeting, and the last of the series under the old organization. A report of this session was published in *The Extension Record* of July-August, 1924 (Vol. 2, No. 4).

The officers chosen were: C. L. Hover, Longmont, president; H. B. Teller, Byers, first vice-president; Mrs. Winona Taylor, Fort Collins, second vice-president; Roud McCann, secretary-treasurer.

ADVISORY COUNCIL FORMED.—The Advisory Council was created by the Farmers' Congress at the 1924 session, which was the last held. The council held its organization meeting at Fort Collins December 3, 1924. At this meeting leaders of various farm organizations met for conference, the thirteen men and women at the council table representing organizations numbering in their membership a total of 30,000 rural people. The conference took up for consideration such problems as taxation, transportation, marketing, farm labor, farm homes and communities, and public domain and national forests. Intensive studies are under way on these and other problems. The council is still too recent to point to specific accomplishments.

During its life of thirteen years the Congress functioned in many ways for the betterment of agricultural conditions. It was an open forum where farmer opinion could be voiced freely and where legislative ideas were broached, shaped into workable measures and recommended for action. For over a decade this body was influential.

IDEA WAS EDUCATIONAL.—Over ninety rural organizations were represented at one session (1911) by accredited delegates coming from all sections of the state and including irrigation farmers, range livestock producers, dry-land farmers and fruit growers. The state was divided into

seven districts on regional lines, each district served by a committeeman, who thus became a member of the executive board. The idea of the Congress was educational and it originated at the Agricultural College as a result of the farmers' short-course sessions that had been held during several winters. These short courses in agriculture and home economics were confined to the lecture rooms and laboratories, and it was felt by the farmers that the scope of work should be broadened. The original plan of combining short-course work with open sessions of the Congress was discontinued for several years, during which time the Congress was merely an open forum at which national and state leaders of agricultural thought delivered addresses and legislative and educational problems were discussed. In the later years of the Congress an effort was made to resume under the original plan, following more or less the idea of a farmers' week. There was not sufficient interest, however, to justify continuing the sessions, hence the work of the Congress was taken over by the Farmers' Advisory Council.

The Agricultural College always provided a meeting place for the Congress, transacted the routine business incidental to the annual sessions and furnished secretarial service through the director of extension. The Congress itself was officered and directed by farmers, the duties of the college being merely ministerial.

The Congress was helpful always in furthering the work of the Agricultural College, scrutinizing the requests made for legislative appropriations and lending influence to measures which were considered of benefit to the agricultural industry.

IN MEMORY OF N. C. DOUGHERTY.—The destinies of the Congress were guided for several years by the late Newton C. Dougherty of Greeley, under whose administration the organization attained its greatest power and influence. He passed away in 1922 and at the next following session, December 12 of that year, a memorial address was delivered by Reverend Monroe Markley of Longmont, an extract from which is given here, as it sums up in well-chosen phrases the esteem in which Colorado farmers held the man who so wisely guided the Congress during a stormy period in the history of Colorado's agriculture. Quoting from this memorial address:

His broad, clear vision distinctly saw that the welfare of our country depends upon the farmer and the interests of the farmer being accorded a larger place in the sphere of social and national economics, and to this great work he gave the best he had of mind and heart, and you members of this Farmers' Congress can bear testimony to the devotion, the unselfishness and the efficiency of his labors.

American farmers, comprising about one-third of our country's population, find themselves, notwithstanding their hard work and their large production, still laboring under serious disadvantage as compared with other groups of workers. The welfare of society demands that the existing inequalities be adjusted. Legislation which promotes the larger well-being of the farmer is not class legislation, for it will promote as well the prosperity and happiness of all classes and conditions of men.

And today, in our state capitals, and especially in our national capital, there are indications of a recognition of these great facts and an awakening to these great needs; there is "a sound of going in the tops of the mulberry trees," and when the time comes, as we trust it will in the not distant future, when the farmer will come into his own, the labors of Newton C. Dougherty, and of the Colorado Farmers' Congress which was so dear to him, will have had a part in bringing in the brighter and better day.

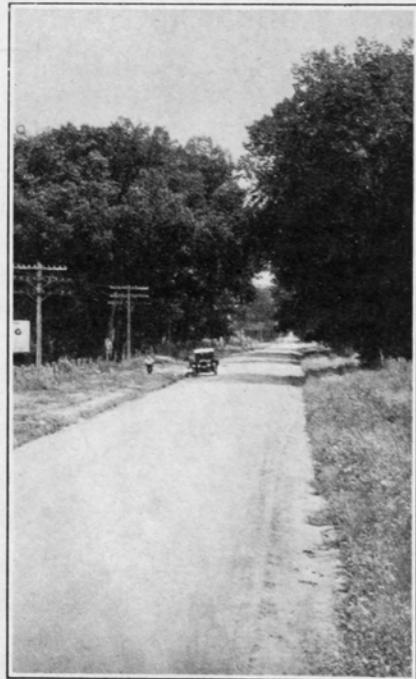
"He rests from his labors and his works do follow him."

If a man's character may be betokened by the intimate friendships he makes and maintains, then the life of Newton C. Dougherty was rich indeed, for he numbered among his comrades such educators as William Rainey Harper and Nicholas Murray Butler; such statesmen as Theodore Roosevelt and William Howard Taft; such Christian leaders as David Swing and Frank W. Gunsaulus, yes, and Henry Ward Beecher, whom he often met in his boyhood home.

But his great heart had abundant room for the humblest of men, his handclasp was as warm for the lowliest son of toil, for he believed with the plowman of Ayr that "the rank is but the guinea's stamp, and a man's a man for a' that."

COLORADO STATE FARM BUREAU

The Colorado State Farm Bureau was organized early in March, 1919, at Fort Collins, during the annual session of the County Agricultural Agents. At that time the organization had as its chief purpose the furthering of agricultural extension work, as done by the agricultural colleges through the county agents and home demonstration agents. In fact, the farm bureaus then active in many agricultural states were directed and controlled by the county agents, though officered by farmers, who served as committeemen to aid in the preparation and carrying out of the educational program. The educational needs and the economic problems of counties and regions varied greatly and while general principles were presumed to have been absorbed by the county agents in their scientific training for the work, the application of these principles varied with locality, type of farming and marketing conditions. It was in the application of science



A gravelled highway in Northern Colorado.

to agriculture that the farmer, for whom the county agent system was created under the Smith-Lever law, functioned in the farm bureau.

At the time of organization of the Colorado State Farm Bureau the county farm bureaus were thus functioning as avenues of educational effort. Already, however, the economic phases of agriculture were forcing production problems into the background, and the feeling was general that there should be leadership from the farm rather than from the college or the United States Department of Agriculture. This feeling was not antagonistic. It was the logical result of the development of initiative, due to group activity of the farmers in the educational improvement of their industry.

NINETEEN COUNTIES REPRESENTED.—At the organization meeting in Fort Collins nineteen counties were represented by farmer delegates. The county agents participated in the discussions, but the farmers did their own organizing, as they had been urged to do. Comment of *Western Farm Life* on the organization meeting reflects the feeling: "Farmers are to keep the organization going and make it of real help to agriculture in the state. The State Farm Bureau is the logical outgrowth of the County Farm Bureau. The national Farm Bureau, when it comes into being, is the next step in the big movement that may be the long-heralded body to speak for all the farmers of the nation."*

Officers were elected as follows: W. G. Jamison, La Veta, president; Frank R. Lamb, Canon City; vice-president; E. J. Leonard, Fort Morgan, secretary-treasurer.

In November of that year (1919), the "long-heralded" movement got under way at Chicago, where the American Farm Bureau Federation was formed. There were 350 delegates at the Chicago meeting, representing 426,000 members of farm bureaus throughout the United States. Colorado sent two delegates, President Jamison and Vice-President Lamb. Both took an active part in the deliberations and Jamison came home as a member of the national executive committee.

The national movement started full swing with the impetus of more actual farmers behind it than any rural organization that had yet come into being. Under the influence of war figures, the officers were given high salaries, comparable to those of big business administrators. Plans were made on a large scale. The best talent available was employed to look after the interests of agriculture. No sectional lines were drawn; wheat grower, cotton grower, tobacco raiser, corn grower, feeder, range livestock producer, wool grower, fruit grower; indeed, all lines of production were included in the original group at that Chicago session.

Much was expected of the American Farm Bureau Federation. Much was actually accomplished in the first flush of strength of the movement,

**Western Farm Life*, April 1, 1919.

which has since settled down as a less spectacular but effective organization, representing the more conservative element of farmer opinion in certain influential states, notably the cornbelt. The national movement, however, is up for discussion here only as it affects the Colorado State Farm Bureau.

ITS CHARACTER CHANGED.—As was expected, the moment that the movement was taken over by the farmers, its character as an extension organization changed. In some states the connection was retained, but in most others, Colorado included, there was a complete segregation, which left the county agent, for the time being, without active organization backing, on the theory that he should work with all farm organizations and not with one. In Colorado that seemed necessary, because, as soon as the farm bureau stepped out of the educational into the economic field, other farm organizations, long active in that field, felt they had competition. However splendid may have been the conception of the American Farm Bureau Federation, practically, the plan for an overhead group in which all farm organizations could participate without losing their identity has not worked out.

The Colorado State Farm Bureau has continued to hew to the line; county organizations have been maintained and state meetings held. Those who have served as presidents are: J. M. Rodgers, J. D. Pancake, W. S. Hill and C. E. Gibson. Among the directors have been E. R. Bliss, Henry Lowell, J. F. Flook, W. A. Martin, P. S. Elting and C. E. Collins. While not a state officer, Charles L. Hover of Longmont has been a tower of strength in the organization from the beginning.

Officers and directors chosen at the last state meeting in Denver, January 20, 1926, are: E. J. Leonard, Fort Morgan, president; H. S. McGillvray, Boulder, vice-president; R. W. Clark, Fort Collins, Secretary-treasurer; and H. C. Henry, Monte Vista; Edward Fair, Romeo, and Mrs. Robert Linton, Longmont, directors.

The following statement of the present status of the organization was prepared, in the main, by President E. J. Leonard:

Since the beginning of the present administration of the State Farm Bureau in 1924 the general policy has been one of co-operation, reconstruction and service. On all public questions the aim is to take a progressive middle course between the radical and ultra-conservative viewpoints.

FRIENDLY RELATIONS EXIST.—Friendly relations now exist between the Farm Bureau and all other farm organizations. A federation of about twenty of these now exists. The State Farm Bureau has had an active part in promoting this from the start and is now represented on the executive committee of the Federation. The freight rate hearing at Denver in

1925 was an outstanding success because of all working together. The aim is to co-operate and work with commercial and industrial interests in any movement for the public welfare. There has been close co-operation between the State Farm Bureau and the State Director of Markets.

In the matter of education and research the Farm Bureau has had an active part in promoting the organization work of the Colorado Agricultural Advisory Council. Comparative studies on taxation and other economic and social lines are being actively worked in co-operation with state educational institutions and other bodies.

Studies are made of referred legislative measures and initiated laws and constitutional amendments which are scheduled to appear on the ballot, and results of such studies are published, so that farmers may have information on the merits of and objections to such proposed legislation. The State Farm Bureau also co-operates with the American Farm Bureau Federation on national legislative matters.

Locally the year 1926 marked the issuance of a pamphlet in Larimer County entitled "Facts on Taxes," in which the state secretary assisted the local farm bureau. This was an exhaustive study of the tax situation, of great interest to all voters.

Progress is also being made on a reconstruction of the county and state farm bureaus. This involves the revision of constitutions, incorporation of these organizations, the bonding of all officers handling funds and the fixing of a more definite financial policy. Plans of a fundamental nature were on foot in 1926 looking toward the establishment of activities on a basis more permanent and continuous.

County Farm Bureaus and their present presidents and secretaries are given in order, as follows:

Conejos: Edward Fair, and W. D. Carroll.
 Boulder: Forrest Johnson, and Miss Elizabeth Pollard.
 Larimer: Fred Marsh, and C. E. Daniels.
 Rio Grande: Charles Mahl, and Mr. Cunningham.
 Saguache: N. E. Morgan, and W. O. Sauder.
 El Paso: E. A. Sawyer, and William H. Paul.
 Montrose: J. T. Treighner, and H. D. Monell.
 Grand: T. C. DeBerard, and P. S. Elting.
 Mesa: Archie Rait, and F. S. Carman.
 Weld: E. R. Bliss, and E. C. Knight.
 Morgan: H. H. Schaefer, and E. J. Leonard.
 Douglas: H. L. Lowell, and J. F. Berry.
 Pueblo: J. B. Harmon.

FINANCING THE FARMER

FEDERAL LAND BANKS.—Colorado farmers are making good use of the federal land banks, which came into existence in 1917, in response to a demand that had been voiced by farmers individually and through their

organizations and the farm press for many years. The passage of the Federal Farm Loan Act in 1916 was the final outcome of the investigations of President Roosevelt's Rural Life Commission, beginning about 1907. It took nearly ten years to crystallize opinion on a plan for rural financing that would embody the co-operative features of European land banks and suit operation to the purposes and temperament of the individualistic American farmer. Colorado is in the Ninth Federal Land Bank District, comprising also Oklahoma, Kansas and New Mexico, the district being served by the bank at Wichita, Kansas.

Colorado's introduction to the new system of land credits for farmers came at a hearing before the Federal Farm Loan Board in Denver, September 16, 1916. Testimony was given as to the need for better credit facilities and lower interest rates for agriculture in Colorado. This hearing was primarily on the subject of location for the Ninth District bank, afterwards fixed at Wichita. The Farm Loan Board was represented by George W. Norris, chairman, Charles E. Lobdell, W. S. A. Smith and Herbert Quick. Testimony was given by M. H. Van Fleet of Alamosa regarding the needs of San Luis Valley farmers and the statement was made that lack of capital and high rates of interest were holding back development of irrigation in that section. The witness stated that interest rates on land loans in the San Luis Valley were 10 and 12 per cent, plus commissions, and commissions often ran as high as 5 to 10 per cent. Loans had been known on which interest rates were as high as 20 per cent, according to Van Fleet. John Lennox of Colorado Springs, speaking for the dry land farmers, said the banks in eastern Colorado were not in position to make loans, and that rates asked by private lenders were 3 to 5 per cent a month. Ex-Governor E. M. Ammons emphasized the need for capital at reasonable interest rates to invest in livestock. The crops can be produced, so this witness said, but the farmers haven't the money to buy stock to consume the forage.

DENVER LOSES THE BANK.—In spite of the strong pleas urging location of the district bank at Denver, the Farm Loan Board decided on the Wichita location. The banks got under way early in 1917, though loan associations had already been formed the previous fall. Colorado had the first association in the United States to report complete organization in line with the provisions of the Farm Loan Act. This was the Federal Farm Loan Association of Antelope Springs, Morgan County, organized October 1, 1916, with the following officers: Guy Peterson, president; C. A. Thompson, vice-president; Leonard R. Crosthwait, secretary-treasurer; C. G. Ayres and A. B. Gill, directors.

The twelve district banks started with a capital stock of \$750,000 each, advanced by the United States Treasury. Each bank has a lending

capacity of twenty times its capital—or \$15,000,000 each. Bonds are sold, bearing U. S. Treasury guarantee, and non-taxable, to supply the demand for loans. The Federal Land Bank makes “farm loans that never come due,” as they are paid off by the small annual amortization payments.

INTERMEDIATE CREDITS.—The federal intermediate credit bank, established in 1923, as a part of the land bank system, re-discounts obligations of farmers to banks and other organizations, which extend credit for agricultural purposes, on notes with maturities of six months to three years. It also advances funds, secured by warehouse receipts, to farmers’ co-operative marketing associations. No extended use has been made in Colorado of this service, as the co-operative associations are being well financed by Colorado banks.

FARMERS OWN THE LAND BANK.—The farmers of Colorado, Kansas, New Mexico and Oklahoma now own the Federal Land Bank at Wichita. The government supplied the capital at the outset, but all funds advanced by the U. S. Treasury have been repaid and the stock which the government owned has been retired. Borrowers are required to invest 10 per cent of the amount borrowed in stock in the Federal Land Bank, and it is the borrowers who now own the institution that serves Colorado. These holdings are redeemed by the bank at the time of expiration of the loans.

Two Colorado men were officers of the Ninth District bank in 1926, Floyd M. Wilson being vice-president and W. E. Fisher secretary. There were outstanding in Colorado at that time 8,181 loans, amounting to \$25,142,037.97 and there were about 150 loan associations in the state.

Aside from the new capital investment, made possible through these loans, resulting in improvements on farms, the purchase of equipment and livestock, the building of silos and relief from exorbitant rates on old indebtedness, the Federal Land Bank has caused interest rates on land loans to decline to a reasonable point. Loan sharks, preying on farm land owners and taking advantage of temporary reverses to squeeze the borrower, have been forced out of business by competition offered through the co-operative credit plan backed by the government.

WELD FARMER FIRST BENEFICIARY.—The first farmer in Colorado to receive money through the Federal Land Bank was Albert Lawrence, of Weld County. He got \$5,300 in August, 1917, through the Greeley National Farm Loan Association, on 70 acres of irrigated land in the Delta section a few miles east of Greeley. With this money he was able to take up a mortgage given to private individuals on which he had been paying 7 per cent interest. The interest on the land bank loan was 5 per cent.

The second man to receive cash was W. D. Kay of Eaton, a member of the same association, who got \$9,000 on 150 acres of irrigated land and

took up a private loan, saving himself \$180 a year on the interest. In these, as in all cases, under the amortization plan, the principal is paid off in installments along with interest payments, and interest plus principal usually calls for a smaller total payment than interest alone required under the old way of borrowing from private sources.

The Greeley association, first to receive money for its borrowers, is the largest in the four states comprising the Ninth District. Loans to farmers in northern Colorado handled through this association amount to approximately one and one-third millions of dollars. D. C. Royer has been secretary of the association since it started and has also served as Colorado director on the Federal Land Bank at Wichita. The first Colorado man to serve in an executive capacity on the land bank at Wichita was Ralph G. Voorhees of Denver, who was treasurer.

The first loan association operating exclusively in a dry land section to receive its cash was the Limon National Farm Loan Association, and the amount paid in August, 1917, was \$39,700, distributed among 18 farmers. These borrowers had been paying 8, 10 and sometimes 12 per cent for money from private sources.

JOINT STOCK LAND BANKS.—While the average farmer borrower of small capital has been greatly benefited by the Federal Land Banks, the Joint Stock Land Banks, organized under the same law, though not co-operative, have served farmers desiring larger loans. These banks had outstanding in Colorado on October 31, 1925, 459 loans on 234,452 acres, the amount loaned being \$7,659,994. Profits on these loans are not distributed among borrowers, but go to the stockholders who run the Joint Stock Land Banks.

There has been a remarkable change in the attitude of the metropolitan banks and money lenders toward agriculture in the last decade, due largely to the efforts of the farmers to help themselves through the co-operative Federal Land Banks. Many large banking institutions now employ men qualified to deal directly with farmers in financial matters and the disposition is to give agriculture equal opportunity with mercantile business in credit accommodations. Co-operative associations are having no difficulty in financing themselves through established private banking channels, and if there existed any opposition to federal lending agencies at the outset, it is not now apparent. The land banks and their subsidiary credit facilities are accepted as a matter of course, as a service to which agriculture is entitled.

MUTUAL FIRE INSURANCE

Other forms of co-operative service applied to farming in Colorado include mutual fire insurance, in which line the Weld County Farmers

Protective Association is an outstanding example. The first policies were put in force January 20, 1913. On December 31, 1925, the company had \$9,345,900 insurance in force. Total losses paid since organization amount to \$39,921.56. Only farm property is insured. The rate is 80 cents per \$100 for five years. No assessments are levied, except in event of exceptionally heavy losses. Progress of the mutual idea in insurance was voiced by President E. R. Bliss in his report at the Thirteenth Annual Convention January 30, 1926, at Greeley, when he said:

"We have apparently reached the peak in writing new business. The increase in business this year was about \$500,000. We retain practically all the old business, having rewritten most of the insurance in force five years ago, which indicates that our members are satisfied."

The company takes in five counties—Weld, Larimer, Adams, Morgan and Boulder. Officers in 1926 were: E. R. Bliss, president; R. M. Haythorn, vice-president; John S. Davis, treasurer; D. C. Royer, secretary; Mary S. Royer, assistant secretary. Directors: E. R. Bliss, Swan O. Nelson, F. M. Mason, J. P. Klug, B. F. Early, S. K. Clark, R. M. Haythorn, Theodore G. Lashley and C. L. Hover.

THE COLORADO STATE GRANGE*

OVER HALF A CENTURY.—For more than fifty years the people of Colorado have known something about the farmers' organization officially named the Patrons of Husbandry, but commonly called the Grange. Now has come the time to tell something of the beginning, growth and activities of this oldest of fraternal and educational associations of farmers. Rightly understood, the Grange has a larger meaning for the people of Colorado than is appreciated by those who think of it as merely one of a number of organizations devised to promote the interests of a certain group of people. The Grange has been and is much more than an agency to advance the purposes and ambitions of the few hundreds or thousands who compose its membership in Colorado at any particular time. It is an organization established as an expression of the hopes, aspirations and purposes of the numerous groups of people who live in the country and earn their living by raising crops and domestic animals, and doing the business connected with finding a more or less profitable market for their productions.

The secret fraternal, educational and business association of Patrons of Husbandry has for its unit a local or subordinate Grange. The first of these subordinate Granges was organized at Fredonia, New York, where it has been in active operation ever since April 16, 1868. But the National

*This historical record of the Colorado State Grange was written by D. W. Working.

Grange had previously been formed, the election of officers being held on December 4, 1867, although informal conferences and one formal meeting had previously been held. So December 4 is recognized as the day of the founding of an order distinctive as being the pioneer of its class and the first fraternal organization to admit women into membership on substantial equality with men. The new organization for the benefit of farmers and their families made slow progress for a time. The first state organization was formed in Minnesota in February, 1869, by representatives of eleven subordinate Granges. Other states followed slowly. The first delegate session of the National Grange was held in January, 1873, although there had been regular annual meetings of the "National" Grange which lacked much of being national. Almost immediately after this meeting the new organization caught the interest of the country, and it became easy to get farmers to come together to form subordinate Granges.

INTEREST AROUSED EARLY.—Colorado farmers were reading agricultural and other papers from their home states, and so interest was early aroused in the territory, at a time farmers were feeling the effects of the depression that followed the Civil War and reached its greatest intensity in the panic of 1873. So it came about quite naturally that Colorado farmers began to see promise for themselves in the growing organization. For a number of years farmers' clubs had been working effectively in the territory, notably at Greeley and Arvada, and there had been a number of proposals to unite these clubs. The result was that on April 4, 1873, delegates from six farmers' clubs and Ceres Grange met in Denver and organized the Colorado Farmers' Union, with Geo. C. Packard as president; R. S. Little, vice-president; W. Holly, secretary; J. C. Feebles, corresponding secretary, and Dr. J. H. Morrison, treasurer. In an editorial article published a few days earlier the Rocky Mountain News discussed the proposal to form such a union, suggesting that the officers should be chosen from the country "rather than from this city," and even mentioned a number of men as suitable for the several offices. The editor expressed the attitude of the paper in these words: "We welcome this movement heartily, bid it godspeed, and will lend it all the aid we can in the use of our columns and encouragement by voice and pen." On November 20 the Union opened its second convention in Denver. Meantime a number of Granges had been organized and were represented at the meeting. Many subjects of vital interest to farmers were discussed. However, organization was the chief topic of consideration, and the convention adopted a resolution expressing the belief that the only ray of hope for farmers was in the organization known as the Patrons of Husbandry.

Here it seems appropriate to let the story of the first Grange appear as it was told at the adjourned session of the Colorado State Grange, held in Boulder in February, 1874:

About one year ago a few of the members of Clear Creek Valley Farmers' Club feeling the necessity of a closer union, determined to form a Grange of the Patrons of Husbandry. It was then no easy matter to get the necessary number to form a Grange, but we succeeded, and got an application, have a history of our gropings in the dark in search of light and knowledge, sent it forward to the secretary of the National Grange, asking him to correct us when we were wrong and send us a dispensation for Ceres Grange No. 1. He did so, but soon after the spring work commenced, and it was impossible to get the charter members all together at any of the first three meetings called. In August, Brother J. L. Brown, who had been appointed a deputy by the National Grange to organize subordinate Granges in Colorado, gave us the unwritten work, organized Ralston Grange, and returned to his home in Nebraska, where he was unavoidably detained until the 6th of December last. In the meantime, Ceres Grange and the Clear Creek Valley Farmers' Club getting impatient at the long delay of the deputy, determined to send two men into Boulder, Weld and Larimer Counties, to prepare the way for the immediate organization of Granges in those counties when the deputy should arrive. Brothers Wm. Lee and J. F. Wilbur were appointed to do this work, and performed the duty faithfully, as the attendance of the masters of forty Granges organized in a little less than two months, as a partial result of their labors, will fully attest.

FIRST MINUTE BOOK.—This account is from the address of George F. Packard, the first master of Ceres Grange; and the two workers mentioned by him were also members of that first of Colorado Granges. Is it worth while to know more of the history of Ceres Grange? The first minute book and the original seal of this pioneer Grange are in possession of the writer. The first record in the book, under the heading "Ceres Grange No. 1, P. of H.," reports "A meeting of the above order held on the evening Monday, —, March, 1873." The recorded purpose was to organize "as above," following which was a list of the thirteen officers elected for the ensuing year. On the following page the secretary wrote a report of a meeting held on August 31, 1873, at which J. L. Brown installed five of the officers previously elected. Below his signature he added a note that subsequently Mr. Brown installed three other officers. The third meeting of record was held October 17. The seal already mentioned has the following inscription: "Ceres Grange No. 1 P. of H. Vasquez. Col. Org. Feb. 8, 1873." This date finds confirmation in the cash account in the back of the secretary's book, where it is shown that on "8 Feby" the sum of \$15 was paid to the National Grange—doubtless the fee for a dispensation to organize. The same cash account contains an item of \$2.60, recorded as "Ex. on Dispensation &c." The constitution of the National Grange, as published in 1874, provided that nine men and four women might receive a dispensation to organize a subordinate Grange. It provided also that the application for authority to organize must be signed by the applicants and be accompanied by a fee of fifteen dollars.

With these facts in mind, it would seem to be clear that the charter list of fourteen names was completely signed on or before the first day of February; that the dispensation granted by the secretary of the National Grange was issued on February 8, the seal being dated accordingly; and that the formal organization meeting for the election of officers was held on that undated Monday evening in March, recorded by the first secretary, J. F. Wilbur, who also kept the cash account. So, as the charter members had paid their fees, signed an agreement to organize and had been given official authority on February 8, 1873, to perfect their organization, it may be well to accept the date of the seal as the date of the formation of the first Grange in Colorado—February 8, 1873.

The quotation above from Mr. Packard has indicated that energetic efforts had been made during the latter part of 1873 to organize subordinate Granges. Indeed, when the convention of the recently formed Farmers' Union met in Denver on the 20th of November, there appeared delegates from four Granges, and the sentiment in favor of the new organization was so strong that the Union adopted a resolution expressing hope in the organization of the Patrons of Husbandry.* With the arrival of Mr. Brown, early in December, the work of organization proceeded rapidly, and soon after a call was issued for a meeting of delegates to form a territorial organization. This meeting was held in Denver on January 27, 1874, and the two following days. The Denver newspapers vied with each other in printing reports of the proceedings. The Times and the Tribune being evening papers, published notices of the meeting on the 27th, and the following morning the News had the following notice: .

A state Grange of the Patrons of Husbandry was formed in this city yesterday afternoon, with the following officers: Master, R. Q. Tenney; Overseer, Harpin Davis; Lecturer, I. L. Bailey; Steward, Geo. C. Griffin; Assistant Steward, H. H. Curtis; Chaplain, W. W. Welch; Treasurer, John Churches; Secretary, P. M. Hinman; Gatekeeper, Geo. W. Morris; Ceres, Mary A. Wallace; Flora, Mrs. L. M. Augustine; Pomona, Mrs. Mary A. Davis; Lady Assistant Steward, Mrs. J. D. Hinman; Executive Committee, J. W. Bowles, Wm. H. Dickenson, F. W. Hammitt.

FAITH AND ENTHUSIASM.—The new organization was very serious in its purposes. At the time the Colorado Farmer, the pioneer agricultural paper of the territory, was edited by a member of the Grange† who wrote

*Greeley Tribune, November 26, 1873.—The Tribune had regarded the Grange movement with suspicion; but after its most valuable local correspondent had become master of the Greeley Grange and an organizer for Weld County, it became quite friendly. In its issue for January 7, 1874, it put at the head of its column of home news, this item: "A Territorial Grange will soon be organized in Denver;" and in the same column mentioned the appointment of J. Max Clark as "Deputy to organize subordinate granges of the Patrons of Husbandry." Two weeks later it contained a column article by Mr. Clark under the title "The Patrons of Husbandry."

†Mr. J. C. Feebles, who had been a lawyer and real estate dealer at Evans, Colorado, where the Colorado Farmer was first published under his editorship in January, 1873, later being moved to Denver. Major Feebles was initiated into Ceres Grange on December 11, 1873, and within a month had been credited as "Farmer Feebles" with organizing a Grange on the Big Thompson. The Farmer published the first "official" report of the newly organized State Grange.

and spoke effectively for the people and organization whose cause he had made his own. The Farmer told the story of the organization of the State Grange as written by Secretary Hinman and diligently and faithfully set forth the advantages of organization and co-operation. The proceedings of the first meeting of the State Grange indicate that there was something closely akin to religious fervor—a fine faith that an agency was being established which would greatly benefit farmers in many ways and give them a power in public affairs of which they had recognized a serious lack.

But time was not to be spared to do all that needed doing. Granges had been organized so rapidly that there had not been time to install officers according to Grange law; so time was taken to install the masters of subordinate Granges. Delegates were elected to attend the seventh annual session of the National Grange, which was to open at St. Louis on the 4th of the following month. A committee was appointed to “draft rules for the government” of state and county purchasing agents. Finally, with other pressing business out of the way, a resolution was adopted fixing Tuesday, February 24, as the date for a special meeting at Boulder, to install the officers of the State Grange and to transact “such other business as may come before the Grange.” Then the Grange adjourned.

Evidently the State Grange acted without sufficient information when it elected delegates to the National Grange, for the law of the order provided that the master and his wife should be the representatives. So Mr. Tenney (Mrs. Tenney being unable to make the trip) was the delegate to the famous St. Louis session of the National Grange—a session especially memorable because of the adoption of the Declaration of Purposes of the Grange.

TENNEY BRINGS INSPIRATION.—With renewed enthusiasm and a more comprehensive knowledge of the aims and methods of the order of Patrons of Husbandry, Mr. Tenney returned to Colorado and took up with vigor the work of his office. But there was little time to work among the subordinate Granges before the opening of the adjourned session of the State Grange at Boulder. This occurred, according to plan, on February 24, 1874. Much important business was done and much of interest happened. A paragraph has already been quoted from an address on the beginnings of the Grange in Colorado. The officers previously elected were installed, except three who were “necessarily absent.” Many subjects were discussed, most of them inadequately because of the shortness of the session. The proceedings were fairly well reported by the Rocky Mountain News, and this day-to-day report was supplemented, as in January, by the republication from the Colorado Farmer of the “official” report of the secretary.

At the January meeting, the State Grange had appointed a state purchasing agent, Mr. Henry Lee, who at the time and for many years was a prominent Denver dealer in farm implements and supplies of various kinds. At the adjourned meeting one of the resolutions adopted was an expression of confidence that the Grange had made "a wise and judicious selection," this action being taken because of a protest against the appointment. The



A Northern Colorado farm home, built on a timber claim.

executive committee presented a plan for a co-operative association, which was approved. The report of the committee appointed to devise rules for the conduct of purchasing agents was also approved, and a resolution was adopted favoring the establishment of a bank "at which members of the order shall have the preference in obtaining loans at a low rate of interest."

GRANGE BANK PROPOSED.—The proposal to establish a bank was made by Geo. W. Packard, Master of Ceres Grange. It was his idea that it was of the utmost importance that farmers should be able to get money at a low rate of interest in order to be able to hold their crops until they could be sold to advantage. At the next meeting of the State Grange (January 13, 1875) a report was made by the committee appointed to consider the Packard resolution, the committee recommending the organization of "The Patrons Banking Company of Colorado" with a capital of \$150,000. This

report was referred back for completion, with instructions that the completed report be approved by the executive committee and published in the proceedings. In the appendix to the proceedings the finished report was printed—but with the proposed capital reduced to \$50,000.

The records show that 42 Granges were represented at the organization session of the State Grange in January, 1874, and that 32 were represented at the adjourned session at Boulder. The reduced attendance was doubtless chiefly due to the severe weather which prevailed at the time. On the second day of the second annual session of the State Grange, which convened at Denver on January 12, 1875, the committee on credentials presented a detailed report showing that 66 Granges were represented or entitled to representation. However, names of delegates for 14 of the Granges were not given, and it is probable that those Granges were not represented during the session. There were actually recorded the names of delegates representing 52 Granges.

Thus it appears that the Grange had made satisfactory growth during the year 1874. However, the absence of delegates from so large a percentage of Granges but recently organized, indicates that hasty and imperfect organization work was done in the early days. The following paragraph from Secretary Hinman's report gives details regarding the organization work done during the year:

At the organization of the State Grange in Denver, the 27th of January, 1874, there were forty-six Subordinate Granges in the Territory; since that time there has been organized twenty-three more, as follows: Deputy James F. Wilbur* has organized ten; Wm. H. Dickenson has organized nine; Worthy Master Tenney has organized two; Deputy David McShane, one; and myself, one; making a total of sixty-nine subordinate Granges in the Territory.

CERES MAKES FIRST REPORT.—Secretary Hinman's report shows that the first report received from a subordinate Grange was that of Ceres for the quarter ended December 31, 1873, at which time there was due the State Grange \$47.34. The same report shows that nineteen Granges should have reported for the first quarter of 1874, and that nineteen did report, showing a total membership of 783 and \$288.89 due the State Grange; that fifty-four Granges should have reported for the second quarter, all but two reporting; that sixty Granges reported for the quarter ended December 30, 1874, three less than the full number, with a total membership of 1,874; and that for the last quarter of the calendar year thirty-eight out of sixty-three Granges reported. The thirty-eight had 1,238 members.

*In his detailed report of his activities, State Deputy Wilbur included the following: "Dec. 4.—Met with Spanish Peaks Grange No. 56, Brother D. F. Hart, Master. This Grange had just completed a Grange hall, which was dedicated on the anniversary of the Order, by a very pleasant meeting, ending in a most bountiful feast. Brother Hart can congratulate himself on being the Master of the best working Grange I have had the pleasure of visiting. In the evening the public was invited to witness the installation ceremonies, which I conducted * * *"

The report of State Treasurer John Churches showed receipts from subordinate Granges amounting to \$466.94 and payments during the year of \$280.52, leaving a balance in the treasury of \$186.42. With this sum in cash available, the State Grange approved bills amounting to \$818.04 and also voted to add \$150 to the salary of the secretary. With our present experience, we can understand that the State Grange was more liberal in spending than it was successful in providing money to carry on its work.

CO-OPERATIVE PURCHASES MADE.—Mr. Henry Lee, the state purchasing agent, reported that he had bought agricultural tools and implements to the amount of \$55,000 and had paid \$1,500 additional for sewing-machines and Grange jewels, seals and implements; and for the future he announced his willingness to make "such purchases as Patrons may order" to the amount of \$75,000. Nevertheless, after the Grange had adjourned, W. H. Grafflin of Meadow Island Grange, was appointed state purchasing agent by the executive committee.

During this second annual session of the State Grange the committee on constitution and by-laws reported a revised constitution, which was adopted; and this amended constitution appears in the proceedings immediately after the announcement of the close of the session. It provided that the State Grange should meet on the second Tuesday in December—and this explains why there were two annual meetings of the Colorado State Grange in 1875.

The third annual session of the State Grange met in the Denver City Hall on the 14th of December, 1875, with State Master R. Q. Tenney in the chair. The Rocky Mountain News account of the meeting stated that "nearly all of the 71 subordinate Granges" were represented. The committee on credentials reported representatives from forty Granges, beginning with Ceres No. 1 and ending with Colfax No. 70. The newspaper accounts do not indicate that much business of a constructive nature was done. Apparently the bank had not been organized, and the new state purchasing agent seems not to have made a report. On the second day of the session officers were elected for the ensuing two-year term, as follows:

Master, J. E. Washburn; Overseer, Jeremiah Leggett; Lecturer, Levi Booth; Steward, William L. G. Soule; Assistant Steward, H. H. Curtis; Chaplain, Mrs. C. A. Thompson; Treasurer, M. N. Everitt; Secretary, A. J. Wilbur; Gatekeeper, R. C. Killin; Ceres, A. L. Washburn; Pomona, Rachel Drake; Flora, A. M. Leggett; Lady Assistant Steward, M. A. Booth.

Only one name appears in this list that was included in the original group of officers. H. H. Curtis was re-elected. Mrs. Washburn, whose name appears here, had been elected a year before to succeed Mrs. Hinman (deceased) as lady assistant steward. Evidently the Grange was determined to attempt new lines of activity. Besides, there was dissatisfaction with

the financial condition of the organization. As has been indicated, the Grange had authorized expenditures in excess of its income. The constitution of the State Grange, as published in the proceedings of the second annual session (1875) provided for the payment of traveling expenses at the rate of ten cents per mile to delegates attending the sessions of the State Grange*; also that the secretary should receive a salary of \$300 a year. Both of these provisions would have been amply justified if there had been a large enough membership in each of the subordinate Granges, which there was not at the time and has not been since.

At the Thursday session a resolution was adopted asking subordinate Granges to hold special meetings to discuss vital points to be included in the state constitution and in the evening the new officers were installed.

When the Grange assembled on Friday morning, the newly-installed officers were in their places. A resolution by J. W. Bowles led to the appointment of a committee "to wait on the legislative and constitutional bodies during their sessions." The following were named: R. Q. Tenney, Levi Booth, J. S. Drake, P. M. Hinman, M. N. Everitt and W. D. Arnett. Apparently this was a new thing for the State Grange to do.

CONCERNED ABOUT IRRIGATION.—The following resolution by Joseph Murray indicates that the farmers had begun to be concerned about the control of irrigation water:

WHEREAS, The water of our rivers and streams should be kept within the control of the State for the benefit of the people; therefore,

RESOLVED, That a clause be inserted in our State constitution which shall prohibit our legislators from ever giving away, selling, bonding or granting charters to corporations by which they can use, or control the use of said water, except to organized companies of actual settlers upon whose lands such water is intended to be used.

In spite of the need for brevity, this much of detail concerning the early work of the Grange in Colorado seems to be necessary here. This was a time of beginnings. What had been developing in the minds of farmers since the first farmers' club had been proposed at Greeley in 1870 was finding expression; farmers were feeling the need of self-expression and of organized efforts in their own behalf. The Grange had grown with remarkable rapidity, considering the scant agricultural population of the territory. Men who were wise in their ordinary business affairs were carried off their feet by enthusiasm and by the prospects which over-ardent champions of the Grange presented to them. And then there were selfish persons who looked upon the new organization as an agency that might

*By-Laws, Article XXII.—Each subordinate Grange shall be entitled to send one representative, who shall be a Master thereof, or his proxy, to all meetings of the State Grange. He shall receive mileage at the rate of ten cents per mile both ways, computed by the nearest practicable route, to be paid as follows: The Master and secretary of this Grange shall give each representative an order for the amount on the treasurer of the subordinate Grange which he represents, and this order shall be receivable by this Grange in payment of quarterly dues. This article shall apply to all subsequent meetings.—Proceedings, page 61.

bring them political and other preferment which they could not hope to secure in the ordinary course of farming and a few other occupations. Now the day of uncontrolled enthusiasm was passing. It was a time for men of steady purpose and clear vision to take the lead and to do the work that must be done through many months and many years, if the true Grange spirit was to lead men and women to learn the lessons and do the work by which the Order of Patrons of Husbandry was to make its long history worthy and useful.

Mention has been made of Mr. Tenney's attendance at the St. Louis session of the National Grange. He attended two other sessions—the one held at Charleston, South Carolina, in February, 1875, and the Louisville, Kentucky, session of November in the same year. Both the Charleston and the Louisville sessions were attended by Mrs. Tenney.

A VOICE FOR WOMAN SUFFRAGE.—The Washburns represented the Colorado State Grange at two annual sessions of the National Grange—at Chicago in 1876 and at Cincinnati the following year. Both were active and capable. At the Chicago session Mrs. Washburn introduced a resolution declaring that “justice to woman demands and the exigencies of the times require” that women be admitted to the ballot. This resolution was referred to a special committee of seven, Mrs. Washburn chairman. Six of the members were opposed to the proposal, and so the chairman later reported for the committee “That they can not subscribe to the propositions contained therein, and would recommend that it do not pass.” This report was laid on the table. A few days later the undaunted Colorado woman presented a thoroughgoing minority report and moved that it be substituted for the original resolution. The Master from Mississippi moved an indefinite postponement, on which Mrs. Washburn “demanded the ayes and noes,” and so got the National Grange on record for the first time on the woman suffrage question. Nine votes from Colorado, Iowa, Minnesota, Missouri and New Jersey were recorded in favor of woman suffrage; the other twenty-four against.

BACKED AGRICULTURAL COLLEGE.—A matter of more immediate interest to Colorado came into prominence while Mr. Washburn was Master of the State Grange. Colorado became a state in 1876, and with the achievement of statehood the people gave renewed attention to education and educational institutions. As early as November 7, 1861, Governor Gilpin had approved an act of the first Legislative Assembly of Colorado to establish the University of Colorado, to be located “at the City of Boulder.” The cornerstone of the first building was laid in September, 1875. The Eighth Legislative Assembly passed an act (approved February 11, 1870), to establish and locate the “Agricultural College of Colorado” at or near

Fort Collins. While the establishment of educational institutions was of immediate interest to Colorado in the middle seventies, it was the Agricultural College that appealed particularly to the Grange as the agricultural organization which assumed to be spokesman for the farmers. Both Mr. and Mrs. Washburn were interested in education for farmers' children, believing that schools and colleges should be organized and conducted for the particular advantage of special groups of people. Besides, the Agricultural College had been established (in law) in Larimer County, in which the Washburns had been among the earliest of pioneers.

The Grange, under the leadership of Mr. Washburn, became the advocate of agricultural education, as distinguished from the kind of education which the university was supposed to be intended to provide. The question got into politics and the issues were sharply drawn. And the question was more than local. The proceedings of the session of the National Grange held in Cincinnati in the fall of 1877 shows that the subject was attracting the attention of the farmers in many states—and this partly because state and other universities were trying to get the funds provided for agricultural education by the Morrill act of 1862. Mrs. Washburn was chairman of the National Grange committee on education at that session. The general report of the committee contained the following paragraph of particular interest to Colorado people:

Agricultural education in Colorado has not yet been commenced. The donation of lands for the support of the Agricultural and Mechanical College is not at present available, nor has there been any considerable amount appropriated for the erection of college buildings. The legislature at its last session created a State Board of Agriculture, composed of eight members, seven of whom are active members of our order, whose especial duty is to take charge of our Agricultural College. The farm and college grounds, located at Fort Collins, have been enclosed by a substantial fence, and one small brick building erected thereon. There has been an attempt made to divert the fund from an agricultural to a mining school, but it is confidently believed that the farmers will be able to carry out the original intention, and establish a school in which the sons and daughters of farmers may be educated in the science of farming.

SEVEN GRANGERS ON BOARD.—We need not inquire into the means used to try to "divert" the funds dedicated to an agricultural college in Colorado, or to the efforts adopted by members of the Grange to keep the funds for agricultural education. It should have seemed clear at the time that, with seven of the eight members of the Board of Agriculture members of the Grange, it should not have been particularly difficult to make sure of building the Agricultural College at Fort Collins. At any rate, there is where it stands today. Doubtless the influence of the Grange had something to do with keeping the original "paper" college in Larimer County and transforming it from a prospect to a reality. Possibly it might have been better for the Grange itself had it devoted its efforts to strengthening its own local organizations and maintaining the various business agencies which it undertook to establish and support. There had been developing

a disposition to get benefits through legislation and the work of the Agricultural College, rather than through the activities of subordinate Granges and the business agencies which the State Grange had promoted. Whatever might have been the wise course to pursue to maintain the early strength and membership of the Patrons of Husbandry in Colorado, the fact stands that the membership and the number of local organizations declined through the two years while Mr. Washburn was at the head of the State Grange.

THE ATTENDANCE DWINDLES.—When the State Grange met in December, 1877, the attendance of delegates was the smallest on record. The Rocky Mountain News printed a list of representatives from twenty Granges. H. E. Washburn of Burlington presided at the opening session. The next day the Grange met at the "usual hour," with Worthy Master J. E. Washburn presiding and in the afternoon the Grange proceeded to the election of officers, but succeeded in choosing four. The following day the list was completed as follows:

Master, Levi Booth; Overseer, Mrs. A. L. Washburn; Lecturer, F. W. Hammitt; Steward, W. A. Bean; Assistant Steward, W. T. Lambert; Chaplain, B. F. Wadsworth; Treasurer, J. H. Dudley; Secretary, H. E. Washburn; Gatekeeper, Wesley Donegan; Ceres, Millie A. Booth; Pomona, M. A. Davis; Flora, L. J. Baldwin; Lady Assistant Steward, Lizzie Drake.

By this time the Grange had so dwindled in apparent importance that the News did not take the pains to report State Grange proceedings at any length. Whether the officers were installed or not seems to have made no difference. And this was the situation when Levi Booth began his long service as State Master. The Grange was in debt. Doubtless it had been in debt since the second annual meeting. A time had now arrived when the State Grange must cut the garment according to its cloth—a very limited amount.

STRUGGLE AGAINST DEBT.—In 1878, 1879 and 1880, Colorado was represented in the National Grange by Mr. and Mrs. Booth. Meantime, Mr. Booth had been re-elected Master of the State Grange. Meanwhile, also, the struggle continued against adversity and debt, a considerable number of Granges surrendering their chapters. Then came the period of seven lean years when Colorado was not entitled to representation in the National Grange. But every second year Mr. Booth was re-elected and continued in the work of instilling spirit and purpose into the organizations that remained. Occasionally a new Grange was added to the list. In 1888 Colorado was again represented in the National Grange, this time at Topeka, Kansas. At this meeting State Master Booth presented a report which told the following story in its first paragraphs:

Colorado has had no representation in this body since its meeting in Washington, in 1880. Since that time our number of live Granges has run from 10 to 4, until last year, when they increased to 8, with a membership of 180, and now we have 21 Granges, with a membership of 610 Patrons. Seventeen Granges have made their reports,

up to and including the quarter ending September 30th, sixteen of which have been reported to our National Secretary, with a membership of 493.

At the meeting of the State Grange in January, 1888, at which time State Master Booth was again re-elected, the treasurer reported \$297.20 in the treasury. Only eight Granges responded to the roll-call at that session; nevertheless it was a meeting full of hope and promise. That was the year after Cherry Creek Grange built its hall, and State Lecturer S. F. Couch in his report said he was "glad to know and to think about the splendid progress made and the work done by the Cherry Creek Grange." This he called an example "which should spur us all to like exertion."

In 1889 the National Grange met in California at Sacramento. Here State Master Booth reported the organization of Darden Pomona Grange, which had already held three two-day meetings. Curiously enough, at least one previous effort had been made to organize a Pomona Grange. The minutes of Cherry Creek Grange for September 18, 1875, show that three delegates were elected on that date to attend a meeting to be held in Denver for the purpose of organizing a Pomona Grange.

BOOTH SERVES SEVEN TERMS.—When the Colorado State Grange met in Denver in January, 1890, Levi Booth was again chosen Master, this being for the seventh time. At this time D. W. Working appeared for the first time in the Colorado State Grange, being then a member and lecturer of Capital Grange. He had been editor for nearly a year of the Colorado Farmer and was supposed to be in a position to be useful to the Grange, and so he was chosen lecturer. During 1890 thirty-one Granges were organized—twenty-nine by General Deputy R. A. Southworth, one by State Master Booth, and one by State Lecturer Working. Six were reorganized—three of them by Southworth, two by the State Master and one by Secretary J. A. Newcomb. The State Grange seemed to be prospering. Southworth was an exceptionally appealing speaker at meetings of farmers. Unfortunately he appealed most strongly to the grievances and the prejudices of farmers. Besides, he believed strongly in improving the condition of agriculture by means of education and legislative action, and he did not sufficiently emphasize the need of education in the Granges themselves through the means under control of the organization. He talked convincingly of co-operation, but failed to get the local organizations to appreciate the need of working together in doing the things they could do without danger of failure. As an illustration of the weakness of the theory he followed, it may be said that of the 29 Granges he organized in 1890, only one was represented at the meeting of the State Grange in January, 1893.

In January, 1892, the State Grange had to face a new problem. State Master Booth declined to accept the re-election offered. He had been at the head of the State Grange fourteen years, and his health was not good.

As had happened once before, the state lecturer was advanced. The complete list of officers chosen in 1892 was as follows:

Master, D. W. Working; Overseer, John Churches; Lecturer, D. L. Tracy; Steward, Wm. B. O'Neal; Chaplain, David Brothers; Treasurer, Miss Grace Booth; Secretary, J. A. Newcomb; Gatekeeper, Wm. B. Roberts; Ceres, Mrs. H. E. Oldfield; Pomona, Mrs. A. Arnold; Flora, Mrs. D. M. Easley; Lady Assistant Steward, Miss Cora Kempton.

Although he had refused to serve longer at the head of the State Grange, Mr. Booth was elected a member of the executive committee, serving effectively with L. M. Herring, R. H. Poage and the Master and secretary.

In 1892 and 1893 Mr. and Mrs. Working attended the sessions of the National Grange held at Concord, New Hampshire, and Syracuse, New York. At the former session Mrs. Working introduced a woman suffrage resolution, which was defeated by one vote, but at the Syracuse session the National Grange by a large majority expressed itself in favor of giving women the ballot.

In his report at the close of his fourth term as secretary of the State Grange, J. A. Newcomb announced that two Granges had been organized during the year and one reorganized; also that five had been dropped from the roll for non-payment of dues. Here are two items from this report:

On Jan. 28th, Longmont Grange No. 130, was organized with 19 charter members by State Master Working.

On Nov. 13th, Boulder Valley Grange No. 131, was organized with 27 charter members by the Master of Altona Grange, William B. Roberts.

The same report showed that there were 18 subordinate Granges and one Pomona Grange and that the total membership was 506. The treasurer reported that the year began with \$152.67 in the treasury and ended with a cash balance of \$91.72.

The election in 1894 resulted in the choice of the following officers for the Colorado State Grange:

Master, J. A. Newcomb; Overseer, Levi Booth; Lecturer, D. W. Working; Steward, Wm. B. O'Neal; Assistant Steward, Wm. B. Roberts; Chaplain, R. H. Rhodes; Treasurer, R. W. Curtis; Secretary, Will T. Wilson; Gatekeeper, George Dane; Ceres, Emma J. Newcomb; Pomona, Deborah M. Easley; Flora, Emma L. Miller; Lady Assistant Steward, Ellen F. Robinson.

MUTUAL FIRE INSURANCE.—At the session of 1896, State Master Newcomb reported the organization of the Grange Mutual Fire Insurance Company. At this time the treasurer reported a cash balance of \$99.11. He also reported receipts from the secretary of \$255.28, while two years before the amount reported was \$281.41, thus confirming the statement of the Master that the Grange had declined in membership during the year. Twelve Granges were represented at this meeting, as compared with thirteen at the meeting two years before. However, the State Grange was not discouraged, and State Master Newcomb was re-elected. The result justified the action of the State Grange. Again and again, at each biennial session until 1906,

Brother Newcomb was chosen to succeed himself. He was the first representative from Colorado to be chosen an officer of the National Grange. Note what happened during his long term of service. In 1908, when he retired as Master, 27 subordinate Granges were represented at the State Grange and three Pomona Granges. The secretary's report showed a total membership of 1,934, 200 of whom were reported as members of Pomona Granges. The treasury showed a cash balance of \$1,167.47 as compared with \$99.11 twelve years before.

Mention has been made of the fact that for a number of years during the terms of Levi Booth as Master, Colorado was without representation in the National Grange. The burden of debts contracted during the early years of expansion had discouraged many members, and so a large proportion of the subordinate Granges surrendered their charters, or simply quit meeting without the formality of reporting back to the State Grange. In one case, the Grange hall having burned, the members divided the insurance money among themselves. Since the fall of 1888, however, following the revival of the organization in Colorado, the State Grange has not been without representation or the right to representation. The Patrons of Husbandry had evidently become an established institution in the Centennial State.

In 1908 the election resulted in the choice of the following officers for the Colorado State Grange:

Master, John Morris; Overseer, Moses Hoover; Lecturer, P. Ricketts; Steward, Rudolph Johnson; Assistant Steward, J. M. Platt; Chaplain, Levi Booth; Treasurer, George M. Griffin; Secretary, Agnes Riddle; Gatekeeper, K. S. Rhea; Ceres, Sarah Morris; Pomona, Amelia Buckman; Flora, Mrs. Eli West; Lady Assistant Steward, M. A. Tobey.

MASTER FOR EIGHTEEN YEARS.—From this point onward we deal with history that has not yet acquired historical setting or perspective. After eighteen years of continuous service as Master, John Morris is still at the head of the organization. He has seen the membership reach and pass its maximum; he has seen the financial resources of the State Grange at the peak, and also at the lowest depression. Not since the first two-year period has the Grange had greater influence in Colorado than it had from 1915 to 1920, when a period of depression set in. Before passing on, it is appropriate to give the membership figures presented at the 1917 session of the State Grange:

Membership, December 31, 1915.....	6,504
Gain by Charter Memberships in 1916.....	2,339
Initiated and Reinstated During 1916.....	1,975
Total Membership, December 31, 1916.....	9,029

It is well known that all organizations have their ups and downs. Perhaps farmers' organizations suffer most from these fluctuations. In the

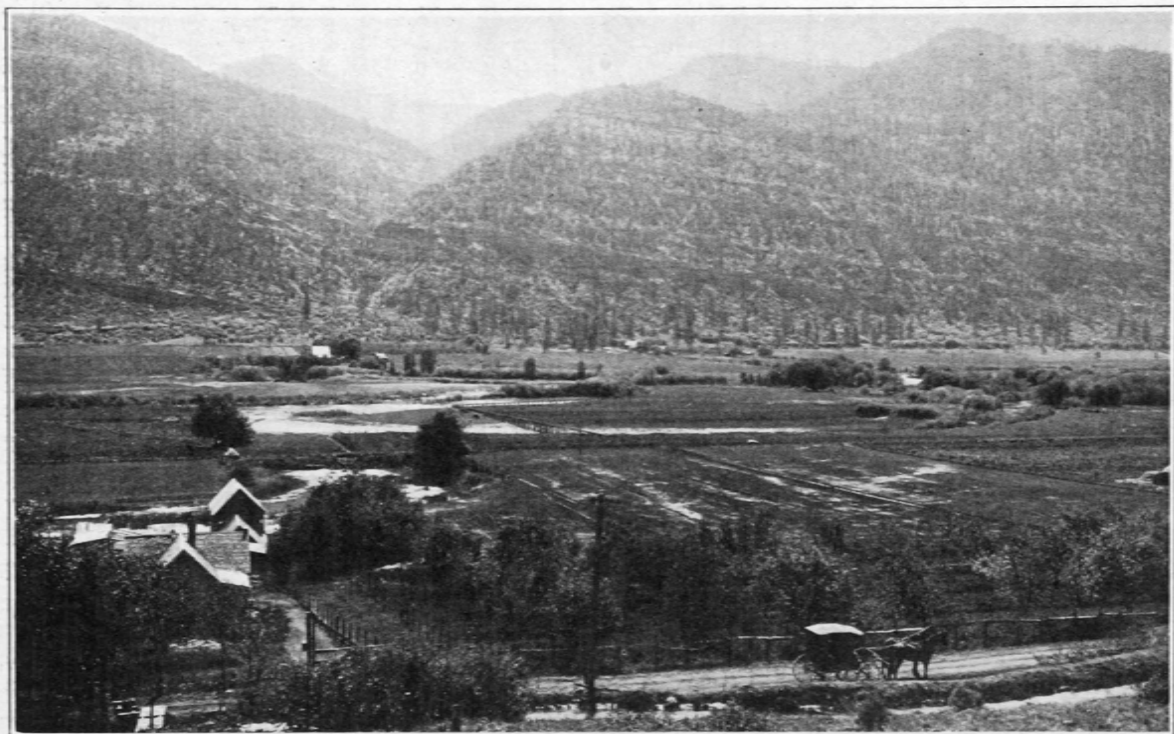
address delivered at the fiftieth anniversary of the organization of the Colorado State Grange, the speaker said on this point:

Part of our training in the Grange should have for its purpose to make us sure that the Grange need not have such great and rapid changes in membership. Steady should be our watchword; patience should characterize our work, and perseverance should become our habit. But our people are very human. At times they respond with enthusiasm to enthusiastic leadership; and then there come times when they lose interest and seem to have lost heart. The State Grange feels the effect; and so decline in membership following the great increase of 1916 need not have been surprising. It was similar to the great decline following the enthusiastic campaign of organization in 1873 and 1874. Then our people had not learned the lesson of education for permanent and continuing work. Even now we do not realize as we should the need of a long campaign of education—energetic, intelligent, persisting training of ourselves in doing the tasks set for us by the Grange.

Just now the Grange in Colorado is passing through one of its severest periods of trial. Let us admit that we need the discipline of trial. We need to learn the lesson of faith and of faithfulness. We need to learn the lesson of intelligent purposefulness. What we have learned and some things we are only beginning to learn we need to live—to incorporate into our daily thinking and our daily work. So we shall continue our activity in our subordinate and Pomona Granges, making these organizations serve the needs of farmers and their families in their homes and throughout their home communities; and so, serving at home with steadiness of purpose and in the firm faith that all of us need the training in co-operative effort for which the Grange stands, we may confidently hold the belief that this season of discouragement will soon pass, and that the Grange in Colorado will be stronger and its membership more firmly united in their purposes and efforts as a result of the discipline of these trying years.

NOW ON UP-GRADE.—Since the foregoing quotations were written the Grange in Colorado has been moving on the up-grade. The business failure alluded to had left the State Grange deeply in debt. That failure was due chiefly to the delinquencies of a trusted employee who had succeeded in hiding his misdealings from the executive committee of the State Grange, just as the delinquencies of bank officers are sometimes hidden from directors with much more experience in financial affairs than the members of the executive committee of the State Grange possessed. In addition, the financial difficulties and the amount of the debt were increased by the refusal of a bonding company to meet its obligations. The necessary lawsuits added still more to the debts. But the State Grange won every lawsuit, forcing the unwilling bonding company to fulfill its contract. Better still, the integrity and staying qualities of the Grange officers were established. With some debts yet to pay, with its work hindered because funds that should be used for organization purposes and the support of the permanent work of the order have to be used to meet old obligations, the Grange is making genuine progress during the good year of 1926. New Granges have been organized, dormant Granges have been revived, and there are abundant signs of increasing confidence already passing over into more effective work.

The first Master of the Colorado State Grange still lives at Fort Collins; the second, third and fifth have passed on; the fourth writes this sketch; and the sixth is busy with his farming and with the kind of vigorous effort that has enabled him to put of his own energy into the building up of the oldest of farmer organizations in Colorado.



The Animas Valley, near Durango, on the Denver & Rio Grande Western Railroad.

CHAPTER X

Agricultural Colonies and Colonization of Labor

THE UNION COLONY.—The most widely known agricultural settlement in the West and one of the most successful is that familiarly known as the Greeley, though more properly, the Union Colony. The idea of this community was conceived by Nathan C. Meeker, while agricultural editor of the *New York Tribune*. It received the unqualified endorsement of the great publicist, Horace Greeley, editor-in-chief of the *Tribune*, who urged its advantages through the editorial columns of his paper and gave Meeker a free hand and the full influence of *Tribune* backing in the organization work.

No other community has exerted such widespread influence on the development of farming in Colorado as has the Union Colony. Prior to the arrival of the colonists at Greeley irrigation development went forward in various localities in haphazard fashion. Only in the Platte Valley, especially along Clear Creek, had any considerable progress been made. It was the Union Colony that started canal building on an extensive scale, introducing successful co-operation in the diversion and use of water and furnishing an example not only for other farming districts of Colorado but for other western states.

Although alfalfa had been grown some years before the colony was organized, this crop was popularized by the Greeley farmers through the Farmers' Club and by those who made extensive use of the newspaper and farm press in relating their experiences in agriculture under the new conditions in Colorado. Among those who aided in spreading information about alfalfa were N. C. Meeker, J. Max Clark, H. T. West and others who grew the crop and knew how to write about it.

The same is true of potatoes, which were grown from the very earliest days along the Platte and in the Clear Creek Valley, but only for local and Denver markets. The Union Colony farmers soon discovered that conditions favored potatoes and they developed this as a commercial crop, making Greeley the first and, for many years, the most important potato-growing section of Colorado and the Rocky Mountain region. Various chapters in this history touch upon the influence of the Union Colony farmers along particular lines of development, especially in irrigation, in potato production and in the early farmers' clubs. It will be of interest here to give a brief chronology of the colony, which was prepared by the Weld County

News upon data taken largely from the excellent history written by Captain Boyd and from the history of Professor James F. Willard.

HISTORY IN BRIEF.—In the fall of 1869, Nathan C. Meeker, then agricultural editor of the New York Tribune under Horace Greeley, its editor, went on a trip through the West, with Utah as his ultimate objective. The trip took him through Kansas and into Colorado over the Santa Fe Trail, north to Pueblo and thence to Denver and on to Cheyenne. He was unable to complete the trip westward from Cheyenne, owing to deep snows, so he never got to Utah, but in Colorado he saw enough to convince him that the territory offered exceptional opportunities for the forming and foundation of a colony.

On his return to New York, being encouraged by Greeley in his plan for a western colony, Meeker inserted in the Tribune his now famous "call": "I propose to unite with the proper persons in the establishment of a colony in Colorado Territory."* In response to the advertisement, instead of the 50 or more replies he had anticipated, he received an avalanche of them, numbering 1,000 or more. The letters and personal calls became so numerous that he announced a meeting of all interested at Cooper Institute on December 23, 1869, at which time and place the Union Colony was organized with Mr. Meeker as president, Gen. R. A. Cameron as vice-president, Horace Greeley as treasurer and Ralph Meeker as secretary. An executive committee of five also was named.

On January 3, 1870, the executive committee met and named a locating committee, consisting of Meeker, Cameron and W. C. Fisk. The committee left for the West in February and were joined at Chicago by H. T. West, who accompanied them at his own expense. The four went to Cheyenne and thence to Evans, the southern terminus of the railroad, by rail, going south from Evans by stage. They inspected the country surrounding the present site of Colorado Springs but rejected it because they considered the farm area too small and the water supply inadequate. Above Pueblo, on the Arkansas, they were likewise unsuccessful in finding anything suitable, and an effort to get into the San Luis Valley proved unsuccessful because of the deep snow.

The party then went north and at the suggestion of Governor Evans inspected the district surrounding the town which bore his name, but because there were already many residents owning property privately there, the district was rejected. In turn, the committee inspected the Big Bend country in the Platteville district and the territory along the Cache la Poudre, but eventually came back and made a tentative selection of the district finally chosen, surrounding and including Greeley. The three members of the committee then returned to New York while H. T. West went to the district where Evanston, Wyo., is now located, but found nothing that attracted him. Of the three who returned east, Fisk left the others at Toledo and there appears to have dropped out of the project entirely.

On March 15 of that year, 1870, the locating committee reported to the executive committee and eventually were authorized to return to Colorado, make permanent arrangements for the establishment of the Colony and to spend not more than \$15,000 in the purchase of a townsite. On the evening of the same day, at a meeting held in Mr. Greeley's office, it was first suggested that the Colony be named in honor of Mr. Meeker, but when he declined the honor and as he had from the first favored the name of Greeley because of his interest in the movement, that name was selected.

In order that the financial condition of the Colony may be understood it should be explained that each member of the Colony was required to pay a membership fee of \$5 and to deposit the further sum of \$150 to be used in the purchase of land and to meet other expenses. This gave the Colony a capital of approximately \$100,000, which provided exceptional financing for a project of that character.

The locating committee then returned to the site which had been selected and on April 13, 1870, the Union Colony of Colorado was incorporated by Messrs. Meeker, Cameron, West, William N. Byers and Daniel Witter, both the latter being Denver men. The committee then proceeded to purchase about 2,590 acres of land from individuals at a cost of about \$28,000, and 9,324 acres from the Denver Pacific, which

*The exact wording of the call follows:

"I propose to unite with the proper persons in the establishment of a colony in Colorado Territory. The persons with whom I would be willing to associate must be temperance men and ambitious to establish a good society."
—New York Tribune, Dec. 4, 1869.

owned alternate sections under a railroad grant, at a cost of about \$31,000, making a total of about 12,000 acres purchased for approximately \$60,000. The committee also procured the refusal of a large amount of government land by filings and an option on other large tracts of railroad land. It is worthy of note that of the land purchased, Capt. Boyd says: " * * * nearly all the lands whose products have built up Greeley were these government lands and railroad lands not owned by the Colony. The greater part of the lands purchased were of small value."

On April 23, Mr. Meeker left for New York to bring his family to the Colony, and three days after his departure, his son, George, died at Evans of tuberculosis. General Cameron and H. T. West remained to carry out Mr. Meeker's plans and receive the settlers.

At that time approximately 442 members of the Colony had paid their full dues and in the months from April to June, the record shows the arrival of more than 140 families, ranging in size from one to 27, the latter family being that of James M. Labar of Enfield Center, N. Y. It is fair to say that of all who came during those first few months, some grew discouraged at once and left, while even those who stayed, found their courage tested to the extreme. It was more of a venture into pioneering than most of them were prepared to face.

Horace Greeley's only visit to the Colony was on October 12, 1870, and from Capt. Boyd's comments, it is evident that the great New York editor received some erroneous impressions of the situation at that time, as his articles published in the Tribune seem to have shown that he did not understand it fully or correctly.

The progress of the Colony was rapid after its establishment, and in June, 1871, according to Hall's History of Colorado, the town of Greeley had a population of 1,155. In 1878, Mr. Meeker, finding himself in financial difficulties, accepted an appointment as Indian agent in charge of the Utes on the White River agency, near the present site of Meeker, in western Colorado.

His death in the massacre in the following year is mentioned in another chapter.

A COLONIST'S EQUIPMENT.—The many little things that were considered necessary in the new life on the Colorado prairie were enumerated by Meeker in a circular sent to those who intended joining the colony. The list reads like an inventory of an old-time country store:

The following list of necessary articles will assist members in packing up: Clothing and bedding, first-class crockery or queensware, valuable bureaus, well packed with fabrics, and securely boxed and strapped. Good clocks and watches, all kinds of light articles, such as brushes, fancy boxes, small musical instruments, children's toys, choice books and magazines, shoes, maps (if good ones), dried fruits of all kinds, small pictures, photographs, lockets, etc., cutlery, casters and cruets, pens, paper (plenty of it), envelopes, etc.

Take an extra supply of bandages and flannels, needles, combs, patterns of all kinds, fine tools, window curtains, thread, yarns, jewsharps for the boys, etc. In moving to the far West, people often leave articles which seem insignificant at the time, but afterward they regret that they did not bring them. Timber suitable for axe and hammer handles should be taken; also cuttings. Many will provide themselves with tents. This is not strictly necessary, however, except where the families are large and unused to western life. The season will be mild, and we expect to have houses built in a short time after the colonists begin to arrive. Those who are able to purchase revolvers and repeating rifles of good patterns should do so and take them along.

AUCTION SALE OF LANDS.—Conditions in the colony a year after the first settlers arrived may be judged from an announcement of the auction sale of colony lands, held July 3, 1871. This sale included town lots, land and water rights, on which title was to pass from the colony to individuals. It was explained that many lots selected early had reverted to the colony for want of improvements, while other choice lots had been held in reserve

according to the original plan for the benefit of schools. The sale was to include also several small and valuable parcels of land near town and also some outlying farming lands, mostly fenced.

The town had agreed to give \$10,000 for building a graded school and the balance necessary was to be derived from this auction sale. The only conditions were that the lands would be subject to "the restricting clause forever prohibiting the manufacture and sale of intoxicating liquors as a beverage." That irrevocable provision made Greeley the first temperance town in the Rocky Mountain region. The Greeley Tribune of June 21, 1871, in discussing the sale of colony lands, said:

"Greeley has now a population of nearly two thousand people. It has three schools, a fine church completed and two others in progress; a large grist mill is to be finished this summer, and already the town is acknowledged an important center of business and trade in northern Colorado. Three lines of stages run to us from many different points at the foot of the mountains, and there is a train each way daily on the D. P. R. R."

FARMERS LIVED IN TOWN.—Most of the land at that time was owned by actual residents, who were engaged in farming it, though most of them lived in town. One of the reasons for the success of the colony is found in the fact just stated. There was no encouragement to land speculation. Farming was to be the chief industry, and it has remained such to the present day. The work of the organizers of the colony was practically finished after they had established and built a prosperous town, constructed two irrigating canals, aggregating over 45 miles in length and costing approximately \$45,000. The colony officers had given their time and services without pay and they felt they should be relieved from public duty, which was to be accomplished by disposing of the remainder of the colony real estate.

THE COLONY OFFICERS.—Officers of the Union Colony at that time were the following: N. C. Meeker, president; E. Hollister, vice-president and superintendent; Dr. Charles Emerson, treasurer; William H. Post, secretary; E. S. Nettleton, engineer.

Trustees: N. C. Meeker, E. Hollister, J. C. Shattuck, N. Holmes, David Boyd.

Executive Council: J. G. Cooper, D. B. Ranney, C. D. Farwell, J. H. Johnson, F. L. Childs, James Inman, A. Hotchkiss, N. B. Knowles, S. A. Woodbury, Joseph Murray, Ovid Plumb, Evan Rea.

Town Trustees: R. A. Cameron, E. S. Nettleton, N. D. Wright, Levy Hanna, H. T. West.

School Directors: J. L. Brush, L. W. Teller, W. H. Post.

HORACE GREELEY'S ARTICLE.—The first issue of the Greeley Tribune (November 16, 1870) contains an article by Horace Greeley under the title "Union Colony, Colonizing the Far West—The Organization, Progress and Prosperity of the Colony." Mr. Greeley began his article by saying that he was unable to answer all the questions of those who wanted to know more about the colony, therefore, "I propose to throw into this article such information as I obtained during my late hurried visit, in addition to what I already knew." So he put his facts into the form of answers to questions, of which several are quoted:

What is Union Colony?

Answer. Union Colony is an association or company of persons who work for a living with intent to select and secure advantageous location whereon to establish their future homes.

What are the leading industries of this Colony?

A. As yet, house-building, mainly in the village, with the arts subsidiary thereto, and digging irrigating canals, have mainly engrossed attention. When colonists first began to arrive, late in April, or early in May, last, there was not even shelter for their heads to be had for love or money. A postoffice, 10 by 15 feet, was the only structure to be seen. Since then, four or five hundred dwellings have been built, with some other structures, so many gardens made, and water let into each; a public park laid out and planted with trees, and large yields from small areas of spring wheat, buckwheat, turnips, etc., etc., realized. I did not hear of a single failure except those caused by the ravages of hungry cattle. I am confident that if every acre owned by the Colony could this winter be plowed, and next spring seeded to wheat, the yield would average 40 bushels per acre. The potatoes grown this year, though mainly planted in June or July, were at once abundant and excellent.

Will the Colony live and prosper?

A. That depends on the people. I do not see how it can well contrive to die, unless its members should take to drink, or gambling, or some kindred folly, and so squander their magnificent opportunities. I anticipate nothing like this.

Horace Greeley was not to be disappointed in his expectation that the colonists would remain, as they were, citizens of high moral purpose, not given to vices or follies that lead to spiritual and material destruction.

PAINTS A ROSY PICTURE.—Meeker contributed an article to The Chicago Tribune at that time on "Colorado" in which he painted a rosy picture of beginnings, as will be noted from the paragraph here quoted:

It was impossible to do much cultivation before the middle of June, when something like 100 acres were planted, and the result was in the highest degree satisfactory. So large and uncommonly fine were the potatoes, beets, turnips and other vegetables, that specimens grown by our people have been sent to New York City and placed on exhibition, challenging the most successful cultivators of the East. The yield of wheat in Colorado is far beyond that of the choicest wheat-growing regions of the States, while the quality of the flour is so superior that a comparison would hardly be proper.

BUFFALO MEAT POPULAR.—While the colonists suffered the hardships of pioneering, they did not go hungry. J. Max Clark in his story of the colony told so entertainingly in "Colonial Days,"* says:

*"Colonial Days," by J. Max Clark, Smith-Brooks Company, Denver, 1902.

During the winter months of several of those earlier years, the farmers and a large share of the townspeople, as well, subsisted almost entirely on wild game for the meat they consumed, instead of patronizing the butchers' stalls. Ex-Governor Eaton, who, in company with John Abbott, now living at Fort Collins, kept the only market in Greeley at the time, could recount, if they saw fit, to all who might wish to hear, how a single beef frequently sufficed for the demands of the market for a week at a stretch, while buffalo hams and shoulders were brought into the place by four-horse loads and retailed at from 2 to 4 cents a pound. Antelope, ducks and geese and jackrabbits served for variety, and if everybody was poor, there was at least enough of good, wholesome, cheap meat.

Clark goes on to relate how he was with a party of hunters down the Platte and up Cedar Creek in 1871, bringing in the hams and hides of forty-six buffalo as trophies of the hunt. During the winter of '72-3 deep snow brought the antelope up to the colony fence in great numbers. A general hunt by the male population of Greeley resulted in bagging over a hundred antelope in one afternoon.

FARM MACHINERY IN DEMAND.—Energy and enterprise were evident from the very beginning in the farming operations of the Union Colony. Farm machinery of the most modern type was demanded. Reapers and harvesters "are running lively these days," according to one account, "on both sides of the river. Combined machines are mostly employed, but we know of one Marsh harvester which is doing fine work. It is run by three men, one driving and two binding, and all riding. In all there must be as many as twenty machines cutting the grain of farmers of the Union Colony. We submit whether this is not a fine showing for a valley where, two years ago, scarcely a furrow was turned and where not a human habitation stood." So said The Tribune in the third crop season (1872).

THE GREELEY FENCE

THEY WERE CALLED SAINTS.—Much sport was made of the Greeley fence in the early days, but the colony farmers let the stockmen laugh, for their crops were safe from harm, though the barricade cost them a pretty penny. The stockmen called them saints, because they said the fence was built to separate the righteous inhabitants of Greeley from the unrighteous barbarians living out in the open spaces.

After the first crop season, in October, 1870, a meeting was held by the colony at which it was determined that a fence should be built to keep out the cattle. The following spring a barrier forty-five miles long of smooth wire and poles and costing approximately \$400 a mile, was erected around the colony lands. The Territorial Legislature during the session of 1872-3 gave permission by resolution to the Union Colony to keep the Greeley gates on public highways closed during the seven months of spring and summer. Later a district fence law was passed and the fence was then acquired by the districts. Eventually it was sold to individuals.

WARNED AGAINST TRESPASS.—That the fence not only served to shut out range stock but was useful in restraining cattle owned by the colonists is apparent from the following official notice appearing in the Greeley Tribune of June 21, 1871:

“The colony fence, built at a great outlay of money and labor, is now sufficiently completed to restrain stock, and owners of stock will please take notice of the same. To turn horses, cattle or other animals at large within the fence is now equivalent to driving them upon gardens and fields; and whoever turns his stock thus at large can be considered in no other light than that of wantonly trespassing upon his neighbor’s ground. The habit of turning cows loose in the morning, to run where they will, and of turning horses loose at night after work is done or either at any other time, is now without excuse, and can no longer be borne. Feed and water are plentiful outside of the fence, and there stock must be kept from this time and forever after.”

This notice indicates that the colonists were not averse to using the free range outside the fence, though they did not look with favor on grazing as a business, which was so foreign to their own ideas of farming.

COMMON SENSE FARMING.—Among the colonists who left their mark on the state’s agriculture was B. S. La Grange,* whose farming operations were described in a chatty letter in the Rocky Mountain Weekly News of July 11, 1877, under the heading: “Rambling Notes from Greeley.” The letter bore the signature “W. B. V.,” undoubtedly W. B. Vickers, compiler of an excellent history of Denver, published in 1880. La Grange was not often in agreement with “Father” Meeker on the subject of farming—probably because he was a farmer. Meeker was a “little lander”—an advocate of intensive farming on a few acres, while La Grange, realizing the fact that markets must be sought at a distance for products of the farm, contended for staples such as wheat and potatoes on the extensive plan. “W. B. V.’s” letter is humorously enlightening on this controversy:

MEEKER FAVORED INTENSIVE FARMING.—When the Union Colony divided its land Mr. B. S. La Grange and some others wanted 160-acre tracts of farming land. Mr. Meeker objected. A man couldn’t farm 160 acres, nor 80 acres; 40 acres was too much; 10 acres was enough. A thorough scientific farmer could evolve a fortune out of five acres. Science triumphed. Father Meeker took his five acres and went to work cheerfully. La Grange grumbled a good deal, but went to work on his 80. As soon as possible he bought an adjoining 80—and then another—a garden farm of 240 ample acres, of which more anon. Comparisons are odious, but it is no sin to say that La Grange was ahead. The other scientists wrestled a while with their truck patches, and presently branched out into fields, and finally into tracts as large as they had means to handle. They could raise squashes enough to supply all creation, but when they were ready for market, nobody wanted to buy squashes in such quantities. One Colorado squash lasts an ordinary family all winter. Result: The squash

*B. S. La Grange was a member of the first State Board of Agriculture.

farmers carried their biggest specimens to the editor of their favorite paper and fed the rest to their stock; then they got credit at the grocery and borrowed wheat from their neighbors until they had a chance to raise wheat themselves the next season. So they kept on learning things by experience until at last they got quite a stock of valuable information, and today there are more men in the Union colony making a living than there ever were before. * * *

There is a vast area under the principal canal of the Colony covered with crops which promise the best yield ever recorded in Colorado. The season has been superb. Never before was rain so plenty and grasshoppers so scarce. Then, the water supply is more than abundant—it is munificent. The great number two canal is running bank full all the time and is actually cutting a canon through the bluffs. It has too much fall. The water must be checked at intervals to prevent cutting, or it will soon run far below the surface. The longer people live under irrigation canals the more they find out. But even then they do not always improve their opportunities.

LA GRANGE'S TREES.—Among these (model farms), is the La Grange farm already mentioned. I looked over his magnificent place last Tuesday and was amply repaid. He lives in a neat cottage literally embowered in a dense grove of shade trees of which he has nearly 4,000 on his place. Those about the house are well grown and not only give a grateful shade in summertime, but serve as windbreaks in winter, and add 500 per cent to the beauty of the place. He has also nearly five miles of trees set out fifteen feet apart along his boundary lines, which are to be utilized for fence posts in a year or two, when his 240 acres will be solidly and substantially enclosed.

Mr. La Grange has over 200 acres under cultivation, including 150 acres of wheat, 35 acres of oats, 25 of corn and potatoes, and the rest embracing garden stuff and a wonderful small plot of giant rye, popularly supposed to grow ten or fifteen feet high under favorable conditions, but which has stopped, apparently discouraged, at about three feet, and is putting out enormous heads which for a time bid fair to add another cubit to its stature. Six miles of lateral ditches supply these fields with an abundance of water for irrigation, and also feed the pipes which supply the house and milk cellar, for Mrs. La Grange is a notable "butter woman" and her rich yellow rolls readily sell for about twice the price of ordinary butter—another evidence that whatever is worth doing at all is worth doing well. That is the La Grange motto, and in it is briefly comprehended the whole science of successful farming in Colorado and everywhere.—W. B. V.

COLONY SET THE PACE.—While Meeker had very definite ideas on co-operative colonization and had once been a member of an unsuccessful communistic group, that experience had made him more practical, hence little was attempted co-operatively that could not be carried out. The greatest achievement in that respect was in canal building for irrigation and more especially in the system worked out for ownership of the water, which went with the land. Farmer ownership of the distribution system worked so well in the colony that it was adopted in other sections of the state. Its success did much to offset the movement for corporate control of canals and reservoirs which threatened the state's irrigation resources at that time.

SAINT LOUIS WESTERN COLONY

Less than a year after the establishment of the Union Colony the St. Louis Western Colony was located at Evans, then the county seat of Weld County, five miles from Greeley. In February, 1872, 600 inhabitants were claimed for Evans. Sixty thousand acres of farming land along the Platte immediately adjoining the townsite were under control of the colony. A six-

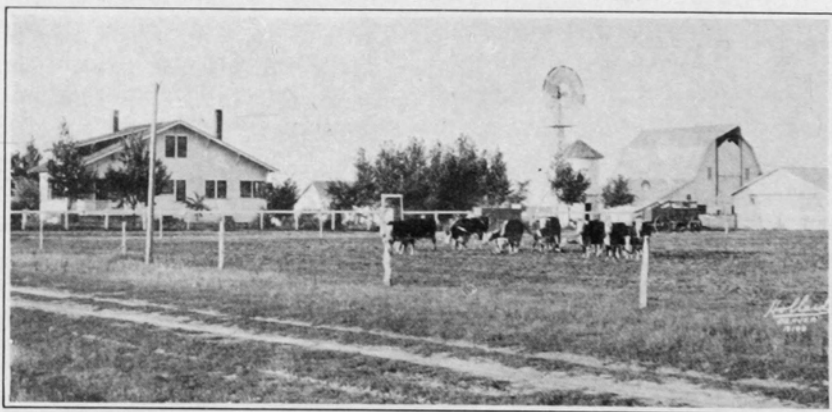
mile irrigating canal had been completed and a second canal, to be forty miles in length, was started.

A prospectus, advertising the colony, maintained that "the farming land south of Evans in the big bend of the Platte is considered the largest body of fertile land in the territory. This land can about all be brought into cultivation the coming season and large crops be produced of wheat, oats, barley, potatoes and all kinds of vegetables—for which there is a sure market at higher prices than can be realized in the States. The land that can be brought into cultivation in Colorado is limited to that lying adjacent to streams of living water, as it is never safe to attempt farming unless it can be watered by means of ditches constructed for that purpose."

EXPECTED ENGLISH SETTLERS.—Arrangements had been made by the St. Louis Western Colony with a society having headquarters in London for securing the "very speedy settling up a large portion of these lands, in small tracts, with the sober and industrious middle class of England."

A. C. Todd was president of the colony and J. C. Feebles secretary. This was a private project and not a co-operative colony.

While there was considerable rivalry between Greeley and Evans, it was not many years until Evans, though the older, was eclipsed by its aggressive rival. However, while the Evans colony movement was under way and other colonization schemes, all in a way imitators of the Greeley movement, were getting started, their progress was noted from time to time by the Tribune.



Fulscher and Kepler Hereford Breeding Farm in Phillips County.

TENNESSEE COLONY.—Greeley Tribune, May 31, 1871—"The colony at Evans, five miles distant, is receiving new members almost every day. An irrigation canal is in process of completion, and a good hotel is to be

built. The Tennessee Colony twenty-seven miles below us on the Platte, is also receiving new members; a canal is under way, and a considerable breadth of land is to be put into crops this year which in a manner is to be on general account. The Chicago Colony at Longmont, thirty-five miles distant, is reported in a prosperous condition, and as they have some good, industrious members from Illinois and elsewhere, planting is more or less extensive, particularly in regard to forest trees."

The Tennessee colony was located in March, 1871. Greeley was the nearest railroad town. The lands on the new colony were being homesteaded, and being in the first bottom "which is several miles wide, no irrigation canals will be required, while they will have an immense stock range on either side." The fallacy of that statement was soon discovered.

Fifty or sixty members had arrived the latter part of March to start the town of Greensboro, named after General Green of Denver, the leading projector.

The Greeley Tribune of September 4, 1872, called the new town Green City and stated that several colonists had been at Greeley to buy lumber, stoves and "store goods." The lumber was rafted down the river from Greeley to Green City.*

CHICAGO COLONY FOUNDS LONGMONT

The Chicago Colony, which was responsible for the settlement at Longmont and the surrounding farming section, was organized at Chicago November 22, 1870. The plan originally was similar to that of the Union Colony, but the co-operative features could not be carried out in detail because it was impossible to obtain a compact body of land suitable for an agricultural settlement. Among those advertised to speak at the organization meeting were N. C. Meeker and General R. A. Cameron of the Union Colony, who had been asked to come to Chicago and aid in the organization work. There was no connection, however, in a business way, between the two colonies. Meeker hoped to interest the Chicago group in Greeley and they were invited to join the Union Colonists, but decided on a separate location after hearing the report of their locating committee.

The first officers were Ex-Governor William Bross of Illinois, who served as president, George S. Bowen, treasurer, and N. C. Pratt, secretary. The locating committee was composed of Seth Terry, H. D. Emery and Wm. Holley. Emery was one of the editors of the *Prairie Farmer* at Chicago. This committee left Chicago for the West January 6, 1871, and they were accompanied on their tour of Colorado by Mr. Hall, a Chicago journalist,

*Green City was located near the present town of Orchard.

and Wm. N. Byers, publisher of the Rocky Mountain News, who at that time was agent for railroad lands in Colorado.

BOYNTON'S HISTORY.—According to a history of the Chicago Colony prepared in manuscript by the late R. W. Boynton, editor of the Longmont Ledger, the committee, on January 23, 1871, reached the village of Burlington (near the present town of Longmont), spending the night at the hotel of Mrs. M. A. Allen. Terry expressed himself there as being favorably impressed with the country. The committee went on north next day as far as the Big Thompson, but returned to Burlington for further investigation of farm lands along the St. Vrain. Their only objection was that there were already too many settlers in the valley, which would prevent carrying out the plan for co-operative purchase of a large body of land. However, it was decided to recommend the location, although a visit was made to Greeley, where they were urged to cast their lot with the Union Colonists.

The Chicago group accepted the recommendation of the committee, which had reported that about 70,000 acres of good farm land was available from the divide between the Little and the Big Thompson south to Clear Creek. An office was opened in Denver and the purchase of lands for a townsite was made with Terry, Byers and P. J. Kelley acting as trustees for the colony. The original purchase of railroad land comprised 2,300 acres at \$5 an acre. This purchase was made through Byers, who was asked also to file on government land for the townsite. A parcel of land was bought from W. H. Dickens, this being part of a farm still in existence and now operated by W. A. Dickens, a son of the pioneer, who turned over the first furrow in that part of the St. Vrain Valley.

The colonists paid in at the rate of \$155 each, which payment entitled the subscriber to select a town lot and a small tract of land, either five or ten acres, according to the distance from the center of the townsite. In March, 1871, E. J. Coffman was appointed trustee to succeed Byers, who withdrew after the deal for railroad lands had been consummated. Construction of the first building on the site of Longmont began March 4. This was called the Colony Building, and it was used as hotel and lodging place for the arriving immigrants. The building was called "The Rest" and its dimensions were 60x24 feet. At that time Erie was the nearest railroad station and it was not until April 16, 1873, that the first train arrived in Longmont. That town then remained the terminus of the Colorado Central several years, before the line was extended northward to Fort Collins and Cheyenne.

BROUGHT OLD COUNTRY FASHIONS.—The Boulder News of April 8, 1871, chronicled the arrival of the Chicago colonists as follows:

"The colonists are beginning to come in quite lively. We are told that two or three parties have arrived direct from England, bringing with them the old country fashions, knee breeches, big shoe buckles and all. One man brought four hundred chickens to start a hennery and another is expected shortly with a thousand. A gentleman from Greeley has come up with the intention of starting a bank in Longmont. Building is rather lively and prospects are good. About two hundred of the colonists have arrived."

"Rusticus," in writing of the colony in *The Boulder News* of May 20, 1871, announced the plan of putting up a building to be used as town hall and for school purposes, temporarily. He commented thus:

"The aim of our little town of Longmont is to rank among the first, if not the first, in educational merits in the territory. Our school committee are all able men, most of them having been teachers of long and tried experience. They have selected Mr. Carr of Waukegan, Illinois, one of the "Boys in Blue," who lost an arm in defense of our nation's honor, a gentleman well educated and a teacher of long experience."

Colonists arrived in numbers during the spring months of 1871, and on May 23 the executive council took full charge. This council was composed of B. S. Barnes, F. C. Garbutt, Joseph Mumford, E. J. Coffman, J. Lincoln and Rienzi Streeter. Officers were elected as follows: Seth Terry, president; B. S. Barnes, vice-president; F. C. Garbutt, secretary; John Townley, treasurer.

During the eight or nine years following, the colony experienced the usual ups and downs, and while there was at times considerable dissatisfaction and much bickering, colony affairs were finally wound up in harmonious fashion in 1880.

LONGMONT TYPICALLY RURAL.—The town of Longmont has always remained a rural center which, like Greeley, has developed many leaders who have stamped their personality on the state's agriculture. Most of the colonists acquired land and went to farming; others carried on business in the town, which has flourished industrially because of the development of its surrounding rich agricultural land. Unlike Greeley, this has been an individual development, but nevertheless it has been successful. Flour milling, sugar manufacture and canning of vegetables, including peas and pumpkins, are the agricultural industries built up through good farming. Here, too, the farmers' club idea has flourished from the early days, taking on a less political and more educational character than was the case at Greeley.

The Union Colonists seem always to have been more critical and disputatious in their rural gatherings than the Longmonters, who had a different

type of leadership and were less inclined to let those leaders monopolize the discussions or act as spokesmen for the community. Under the co-operative idea always there seems to be a more vigorous outcrop of autocracy in leadership. The man who cracks the whip under co-operation gets mass response, due to this thought of obedience to the commune, while the community that has no co-operative features is less easily swayed by men or ideas.

Longmont, however, has a well-defined rural atmosphere, and its merchants have backed agricultural projects and movements more generously than those of most other agricultural towns in Colorado. In that respect it is the most typical rural American town in the state and it has never tried to get away from that classification. Nearby have been produced some of the highest wheat yields on record in America; other products also show the fertility of the soil and the experience and ability of the farmers. The Commercial Association at Longmont lives because of agriculture, and its chief business is agricultural development with tourist interests only a secondary consideration. If another comparison may be permitted—Greeley's fame for high morality and clean living originally came from its laws and ordinances; Greeley was kept good by enactment; it talked about and was temperate in all things—and is today a model town. Longmont possesses every virtue and no more of the vices than does the Union Colony town, but seldom has the matter been publicly mentioned. The reason again, it seems, is difference in type of leadership—a Greeley led into the paths of righteousness, foreordained to goodness; Longmont simply reaping the natural reward of the uprightness, industry and thrift of its founders, the Chicago Colonists. One who is familiar with both communities but not resident in either can sense this almost intangible difference in the character of the two excellent towns.

THE GEORGIA COLONY.—Arrival of the Georgia Colony was chronicled in the Denver Tribune of April 17, 1871. Some fifteen families numbering in all about 125 persons, were encamped "on the hill opposite the depot," said the Tribune. They were given a free dinner by Mr. Ford (a restaurateur). These people were to settle on the Huerfano and the Cucharas in Huerfano County. The members of the colony were from northwestern Georgia and western North Carolina. They came to Denver by rail from Cleveland, Tennessee.

FORT COLLINS COLONY.—Of the Fort Collins Colony, which was a townsite promotion rather than an agricultural colony scheme, the Greeley Tribune of December 18, 1872, said:

We have received a circular from the Larimer County Land Improvement Company, which announces that it is the trustee of 240 acres of land belonging to an agri-

cultural college to be built at Fort Collins and also that it has secured one-half of the town lots of Fort Collins and suburban lands lying next to the town "for and in the interest of actual settlers only," or in other words for the establishment of a colony which is to be called the Fort Collins Agricultural Colony of Colorado. Fifteen principal men of Larimer and of Weld Counties are the officers and trustees. The location is good, the soil is unsurpassed, timber, stone and other minerals are near and abundant, and the valley in the vicinity contains some of the best farms in Colorado. Within a short time a railroad will be built from Greeley to Fort Collins, twenty-five miles, and also thence to Longmont, though it is highly probable that Laporte, six miles beyond will be the point of junction. It is inevitable that the whole valley of the Cache la Poudre is to be thickly settled, and that every acre is to be cultivated; nor can too much be said of the fertility of the soil and the healthfulness of the climate, nor the beauty and grandeur of the scenery. The circular above referred to, states that the plan of the colony is similar to our own, and of Colorado Springs; but the plan of each differs as follows: The Union Colony had the whole of the land of the location to divide among its members; that of Colorado Springs had two-thirds, the other third being retained by the projectors, while that of Fort Collins has one-half.

LAND SETTLEMENT SCHEMES.—In later years colonization movements were carried on mostly by land settlement companies, working in co-operation with the colonization departments of the railroads. Such movements were usually successful in establishing groups of farmers and in building new towns, but in a few years their identity as colonies was lost, even though some were mainly composed of settlers of foreign birth. These people were quick to adopt American ways of farming and the first generation born on Colorado soil was truly American.

THE GERMAN COLONY

UNDER MILITARY ESCORT.—In the year 1870, and only a short time prior to the arrival of the Union Colonists at Greeley, there came to Colorado a cavalcade of pilgrims under military escort, bound from Chicago to the Wet Mountain Valley to establish a settlement in the wilderness. Though apparently well financed and backed by the Federal Government with a promise of land concessions and measures of military protection that aroused the ridicule of the people of southern Colorado, this colony proved a failure, but not through any fault of the colonists, who were earnest, intelligent, hard-working Germans. Poor leadership and lack of knowledge of the agricultural conditions to be met, were the causes of failure as a colony movement, though many of the colonists remained in the Wet Mountain Valley, where they built up substantial farms and communities, in spite of a bad start.

Carl Wulsten, dubbed by newspapers "Karl the First," was the leader of this opera bouffe movement. Whatever might be said of "King Karl's" impracticability in seeking to establish an agricultural colony in the unbroken wilderness of a high mountain valley, this German promoter was possessed of enough political influence and gift of gab to interest the

President of the United States and the territorial governor of Colorado in the movement.

The colonists were recruited in Chicago, which had witnessed the arrival from Germany in the previous years of thousands of emigrants, who hoped eventually to go upon the land. Wulsten secured the introduction in Congress of a bill which, had it become a law, would have given the colony a block of forty thousand acres of land. Each family joining had paid \$250 into a common fund, administered by Wulsten and his associates, known by their corporate title as the National Land Company. These associates were Albert Phillips, secretary of the colony, and T. Merten, treasurer.

AIDED BY COLFAX.—After completing the colony organization at Chicago Wulsten went to Washington, and through the aid of Vice-president Schuyler Colfax, he obtained orders to the commanders of military posts along the route from the terminus of the Kansas Pacific Railway to the colony site in what was then Fremont County, for a military escort, as well as a train of ambulances for the women and children and army wagons for the freight of the colonists. Tents also were furnished by the government for use along the way and in the colony until cabins could be built.

After the bill providing for the donation of the forty thousand-acre block of land had been properly introduced, referred to the committee on public lands and favorably reported by that committee, Wulsten proceeded to close up the organization by collecting cash payments which netted \$40,000, "for preliminary expenses."

There were about 250 men, women and children in the company that left Chicago in March, 1870, over the Chicago & Alton for their new home which, according to Chicago papers, was "Colfax, Colorado Territory," the vice-president having thus been honored by having a prospective settlement named for him.

"The party consisted of healthy, robust looking men, women and children, the men being well equipped for their journey with rifles and accoutrements" according to the Chicago papers. The railroad company supplied a special train for the passengers and a freight train for their household effects and livestock.

At St. Louis the German Society met the train with a German band and there was the customary Teutonic hospitality and godspeed, as they passed through on their westward journey. The Kansas Pacific brought them in good time to Fort Wallace, Kansas, where government troops took charge.

ARRIVAL CAUSED A STR.—In the company were eighty able-bodied men, classed as farmers, merchants, laborers and mechanics, the balance of the

250 being women and children. Their arrival at Pueblo and encampment on the banks of the Fontaine caused considerable commotion. They were traveling over a highway that had not been menaced by Indians for several years, and their warlike appearance, under military escort, for which the colonists themselves were not responsible, but which was due to the theatrical inclinations of "King Karl," brought them ridicule.

The Colorado Chieftain had been watching the progress of the movement and comment thereon was pointed and sarcastic, this bringing a reply from Wulsten, at a public meeting in Pueblo, that indicated the ability of the promoter to hold his own in an argument and convince the people of his good intentions. The Chieftain had this to say, editorially:

Now, it will be borne in mind that the old citizens of Colorado; we who have lived here for ten and twelve years; before the days of railroads; when the population was sparse, and surrounded with hostile Indians, who were slaughtering on every road and in every settlement, found it extremely difficult to prevail upon the authorities to furnish arms for the protection of our homes, much less furnishing us military escorts and ambulances in making our journeys and settlements. Weeks and months of Indian wars used to pass before we could get the ear of the Government to believe that such things existed at all. We were in great luck, if after fighting savages a year, "two cases of arms" were sent out for the use of the whole Territory, to save our lives in getting a foot-hold and making the Territory what it is today.

But now, when a party of emigrants propose to ride on a railroad across the plains, into the settlements of the Territory, and travel thence to their destination through a thickly settled country, over a road filled with freight teams, and a daily line of coaches running over it, past two military posts; a region of country, in short, through which there is now no more danger in traveling than these emigrants would encounter between New York City and Boston, a man goes to Washington and proposes to come out here and make a settlement, and call it after the name of the Vice-President of the United States, he is rewarded with immediate smiles, the ear of Government is bent listening, and the great Secretary of War is made to come down, and he forthwith sends orders to military posts all along the line to furnish escorts of troops, arms and rations, to cover the march of these Teutons along through the peaceful corn fields of Pueblo and Fremont counties.

They leave Chicago well armed, say the papers, "with rifles and accoutrements." After they step from the railroad platform into the thriving settlements of Colorado, they receive from our considerate Governor "two cases" more. With this preliminary preparation for defence against the hostile attacks of jack rabbits and prairie dogs, the Teutonic knights of modern chivalry are enclosed within a hollow square of the armed troops of two military posts, and the word is given to advance upon the towns and settlements of Southern Colorado! We do hope they will not suffer from the want of arms.

The Chieftain also raised a question concerning the congressional land grant, remarking that these favored naturalized citizens certainly had reason to declare that this was "the best government the sun ever shone upon."

THE STOP IN PUEBLO.—That the colonists were not so lucky as the Chieftain thought, did not come to light for several months. In the meantime their arrival and departure had been properly chronicled, as follows:

The German Colony arrived at Pueblo on Monday evening, and encamped on the Fontaine, near town. In response to an invitation of citizens, and an expression of welcome to the colonists, Mr. Wulsten delivered an address in the courthouse at night,

explaining the history, scope and objects of the colony. * * * At the close of Mr. W's remarks, Rev. Mr. McMains made a short but stirring address, assuring the colonists of the good will of the citizens of Southern Colorado, and their desire to see the whole country thickly settled by immigrants. On the following morning, the train broke camp and passed through town, halting long enough to allow our citizens to inspect the outfit of the company. There were thirty-eight six-mule government wagons, and nearly as many teams and wagons, which were loaded with machinery, agricultural implements, household goods, provisions, etc. They have machinery for a grist mill, saw mill, flouring mill, sash and door factory, etc. There are ninety-two families, comprising three hundred and thirty-seven souls, six of whom have been added on the road out, by means of what Goldrick calls "arrivals," and what our stock growers term "natural increase." The members of the colony, both males and females, are generally large, robust and as fine looking persons as are seen among immigrants of this class. Many of them speak very good English, and are quite intelligent. Among the other "traps" of the baggage wagons, we noticed a small church bell, or at least a bell that might be used for church purposes, although we did not learn whether the party were church-going people or not. At all events, the bell seemed to us a good thing to have for church, schoolhouse or signal purposes, and the echoes it will awake in the Wet Mountain Valley will be as pleasant as novel. They go from here to Canon and thence into the valley they have chosen for a home, and will immediately go to work to erect cabins and put in crops. We wish them every success, and only hope that this is but the van of thousands of industrious and intelligent immigrants who may follow out to fill up and improve the broad and fertile acres of Southern Colorado, in advance of the railroads through our valleys.—The Colorado Chieftain, March 17, 1870.

READY TO FIGHT INDIANS.—In his lengthy address at the public meeting, held in the court house at Pueblo, Wulsten denied that political pull was exercised at Washington to secure a military escort, or land concession. All that was necessary, he said, was for him to convince the President of the practicability of the enterprise. The administration desired to encourage emigration, "enlarge the settlements of the territories to their greatest capacity, and force the Indians to the background." He said the party had been organized into militia companies and that ninety-two men, "armed, equipped and officered, willing to fight for their wives and children, would certainly be as effective as an equal number of United States soldiers, who are proverbially unlucky in finding Indians."

GERMANS SUFFER HARDSHIPS.—The sequel came in fall, when a correspondent of the Colorado Chieftain made a tour of the Wet Mountain Valley, to record the progress of agricultural development. Of the colony he wrote:

So far I have not said much in reference to the German Colony, from the fact that their affairs are so mixed up that I don't know what to say. From all I can gather from the contradictory nature of the reports in circulation concerning them, I should conclude they are rather a "bad row of stumps." To use the expression of a member of the colony, they "habe peen schwintle out of ebretings," and "habe peen humpug" ever since they "goom into te walley." The reader can form his own conclusion as to the source from which their troubles came. It is unfortunately true that they did not raise anything this season to live on this winter and during the next farming season, and their money and credit through bad management of their leaders, are pretty well "played out." The colony ask a very grave question, which but few men can answer correctly and that is, "what has become of the forty-two thousand dollars paid into the treasury before starting from Chicago, when all they have to show for it are five hundred goats (worth \$2,000), machinery for saw and

planing mills (worth \$6,000), perhaps a thousand dollars' worth of agricultural implements, and two hundred head of cattle, for the payment of which almost their entire property is mortgaged, besides an indebtedness of several thousand dollars which otherwise hangs over their heads. Several have become disgusted with the colony, forfeited all the interest they had in it, and gone to other parts of the valley and taken up ranches on their own account. Others have left the valley entirely, while still others have gone out to labor during the winter to lay in supplies for the coming summer. The remainder, with commendable energy, still stick to the improvements they have made, which are considerable, full of hope that they will be ultimately successful. They are busily engaged with their saw mill and by this time are sawing shingles, but they will not be likely to saw any lumber before spring. Owing to the great demand for shingles on the Arkansas, I think from their manufacture they will be able to live during the winter, and perhaps lay something by for the summer. If they can "freeze out" the adversity which has already befallen them by another year, those who remain will be successful.

STORY OF A SURVIVOR.—There are only a few survivors of the Wet Mountain Colony. One of these is Conrad Riester, who, with his son Charles runs the Primrose Ayrshire Farm at Steamboat Springs. From him it was learned that Wulsten died in poverty at Rosita, one of the towns founded by the colonists. Wulsten's honesty of purpose was not questioned by the colonists. He was extravagant and unbusinesslike.



A Larimer County Forestry Club, listening to address by John McLaren, U. S. Forest Service, at a tie camp in the Colorado National Forest.—Photo by Ackerman, U. S. D. A.

"If he would make \$100 he would spend \$200," is the way Mr. Riester expressed it. "He was a smart man; I don't believe ever a smarter man

came to Colorado than Wulsten. Congress did not grant the land that was asked for and the colonists were obliged to take up homesteads, just as is done now.

"At our meeting in Chicago we decided to send a locating committee to the state; Wulsten was on that committee, so was Mr. Merten, who died at Rico some years ago. Phillips, another member of the committee, was for years on a ranch in Pleasant Valley above Canon City, but has passed away. He was county clerk at one time of Fremont County. The committee did not know anything about land, consequently they selected some of the poorest in the county.

"The government gave us twenty-four covered wagons, four mules to each wagon, to take our women and children to the Wet Mountain Valley from Wallace, Kansas. Each man was equipped with a Spencer rifle, plenty of ammunition and also a tent. The government offered us provisions for ninety days, but we declined to accept food; that was the German spirit. Afterwards some of us did not have enough to eat.

"The first year grain was put in so late that it froze. I remember that a meeting was held one evening to find out how many were really farmers, and out of 82 members seven reported having had farming experience; the rest were mechanics. It was then like now—nobody wanted to farm; all wanted to talk about it and tell the other fellow how to do it. There was no money in the county then; you could not go out and make a dollar; everything was done by trading. After the men's clothes were worn out, the women folks cut up the tents and made clothing of them. Finally the colony went to pieces. Some settled in the valley and became well-to-do in the course of years; others went to better farming districts and made good."*

CONEJOS COUNTY MORMON COLONY

DIRECTED BY BRIGHAM YOUNG.—The story of the Conejos County Mormon Colony was given to Luther A. Norland† by the late Bishop S. C. Berthelson of Sanford, Colorado, some years ago. According to Bishop Berthelson, the matter of establishing the colony was directed by Brigham Young, who in a communication to the Quorum of the Twelve Apostles of the church in 1876, asserted that there was land at the headwaters of the Rio Grande in Colorado for his people to settle and develop. Death overtook the Mormon leader before this colonization plan could be carried out.

President John Taylor, his successor, arranged at an early date to carry out the plans of Brigham Young. At the conference in Manti, in July, 1878, the matter was brought up for consideration. The result was, five

*Re-arranged from letter of Conrad Riester of Steamboat Springs, written to the historian in 1926.

†These facts about the Mormon settlement are from notes furnished D. W. W., by Luther A. Norland.

families were selected to go and explore the country at the head of the Rio Grande and report as to its agricultural possibilities. San Pete County, known as the granary of Utah, furnished the leaders for this movement. They were selected for their experience in farming and irrigation operations at high altitudes, and they were Bishop Hans Jensen, John Allen and son, S. C. Berthelson, John Hogard and Walter Cox.

UTES WERE UNFRIENDLY.—Six teams and food for the journey constituted their sole equipment. They were accompanied by eight mounted scouts, who were more or less familiar with the country. The Ute Indians in the uninhabited territory to be crossed were unfriendly. The party followed the route taken by Colonel Gunnison on the return journey of the United States troops sent to Utah in 1857 under General Albert Sidney Johnston.

October 6, 1878, found the journey successfully ended and camp made near Los Cerritos on the Conejos River. The Mexican people seemed friendly and the emigrants remembered with gratitude the kindness shown them by such leaders as Jose Victor Garcia and others, including Major Lafayette Head. On their part the Mormons did everything they could to deserve these kindnesses, assisting the Mexicans in various ways. Upon investigating the methods followed in grain raising by the Mexican farmers, the Mormons found that they did not half plow their ground and that they invariably put in their grain on the moist bottom land, with the result that a rank growth was produced, which kept the grain growing and green until the September frosts generally nipped it. It had become a generally accepted opinion that at the altitude, 7,500 feet above sea level, only barley and potatoes could be matured.

Here the experience of the emigrants in farming at an altitude of 6,000 feet in Utah came into use. They knew that sandy loam and even gravelly land was better suited to maturing wheat and oats than the heavy bottom lands of the Conejos River. The abandoned ditches and fields where grain had been tried in those bottoms by the Mexicans, now grown up in blue-stem and other grasses, indicated frosted grain.

During the winter of 1878 and '79 the emigrants sought work, some of them freighting baled hay as far as Leadville. Others secured tie contracts to earn money to support their families. By the spring of 1879 they were called upon to prepare for the families who were coming in from the Southern States Mission and for whom town lots must be provided to build their homes and to begin farming in a small way. A lease was secured from the state on Section 24, where Manassa is now located, and by April they were busy plowing and seeding some forty acres of wheat and oats.

MORMONS WERE NOT WELCOME.—Not a little unfriendliness was shown them. When they began the construction of a ditch they found that one of the main channels of the Conejos River had been dammed up; the very one from which it would be necessary for them to take their water supply. They were not to be bluffed out of their rights, and when Bishop Hans Jensen called for volunteers to break the dam, every man in the ditch camp jumped into the river and got busy with pick and shovel, tearing out the obstruction. They expected trouble over taking the law into their own hands, but none developed. They got water to their crops in time and threshed out 400 bushels of well ripened grain in the fall of 1879.

Additions to the colony were beginning to come in considerable numbers from the Southern States Mission, and according to the policy pursued by the Mormon Church in its colonization plans, a number of experienced farmers from San Pete County, Utah, were "called" to join the colony, in order that their experience with irrigation and farming at high altitudes might be helpful to their brethren from the South, who had been accustomed to growing cotton at sea-level. Encouraged by their moderate success in 1879, a considerably larger acreage was cropped the next year, and so on from year to year.

In the fall of 1879 the late W. F. O. Behrmann came up from the Little Colorado River in Arizona with eight yoke of "Church" oxen, sent as an aid to help the Mormon settlers in Conejos County to put in their crops. Mr. Behrmann, in the spring of 1880, put in 20 acres of wheat and oats near Manassa, and, as the crop was unfenced, he had difficulty in keeping range stock from destroying it. In telling of his experiences of sleepless nights in guarding his grain, he said: "With what a relish did we eat the bread that the good wife made from that wheat; assuredly we earned it in the sweat of our face."

"As I look back upon it now," continued Mr. Behrmann, "I think those were strenuous days. Our leaders were chosen with rare foresight. In Bishop Jensen we had a man who had been a successful farmer in Denmark and had helped to establish in San Pete County a prosperous farming community in what appeared at first nothing but a desert. In Bishop Berthelson we had a man, at once resourceful and energetic, ready to tackle anything from a tie contract to a railroad grade, with which to earn money to help our community. Though not a man of means he was never too poor to help the needy in their affliction and poverty, giving freely of his substance on many occasions. Had our leaders been faint-hearted, we should never have succeeded in the face of such difficulties as we met on every hand."

The difficulties referred to by Mr. Behrmann included those due to prejudice that existed against the Mormons.

PEOPLE FEARED POLYGAMY.—Fear was expressed that an attempt would be made to introduce polygamy. Stories current years before were revived and old prejudices aroused against the religion of the followers of Brigham Young. The excitement was brief, for it was soon discovered that these settlers, most of whom had never lived in Utah, had peaceable intentions, and whatever might be their religious peculiarities, they were good farmers and law-abiding citizens. The fight against them was led by *The Denver Tribune*, at that time the leading organ of the Republican party in Colorado. One reason for political antagonism was the fact that the Mormons at that period were Democratically inclined, because of the strong stand taken by the national Republican administration against polygamy.

The story was current that the Mormons intended to establish a line of settlements 25 miles apart from the east border of Utah, through Colorado to the Kansas line. A leader of the colonization group was questioned under oath by Colonel Claighorn, receiver of the United States Land Office at Del Norte, on his religious beliefs and marital practices. Newspaper accounts of the hearing declared he had stated that he had but one wife and five concubines, and 26 children. Concubinage, so he informed Colonel Claighorn, was practiced by King Solomon, and Solomon's example was followed in Utah. Naturally, such statements appearing in the press as news items aroused anti-Mormon sentiment. The Longmont Ledger raised this inquiry: "Must the Utes go, is no longer as much of a question as shall we allow the Mormons to settle?"

COLONISTS WERE HOSPITABLE.—Only a few weeks later, however, a correspondent of *The Denver Tribune* visited the new settlement in the San Luis Valley and got acquainted with the Mormons. He reported that they were not only inoffensive, but decidedly hospitable. He found Bishop Berthelson in field attire at the plow and not in ecclesiastical vestments. The Bishop gave the correspondent a hearty welcome. The newspaper man stayed to attend what he called a "fair" and there he fell captive to the charms of the Mormon maids and lost all his preconceived notions of the unmoral tendencies of these new citizens. There was a dance and the correspondent thus describes the event: "The Mormon girls looked bewitching, and in reply to one's innocent inquiry as to our ability to dance and sundry other feminine inquisitivenesses, we were tempted to exclaim, 'Almost thou persuadest me to be a Mormon'. In fact, had not the laws of Colorado been somewhat stringent as regards the number of wives a man should own at once, we should have embraced that faith—and all of those

pretty little divinities. We left this enticing little place and all its charming Mormonesses with many expressions of regret.”*

Religious prejudices have long been forgotten and these communities are hardly distinguishable now from others that have been settled by individual families, as far as the everyday affairs of the people are concerned. They do, however, maintain church solidarity here as in Utah, the Mormon Church taking an active part in the determination of economic questions and local community problems, such as health, charities and other social matters. There is a cheese factory at Manassa, built and maintained as a result of the Mormon habit of co-operation. Mormon and non-Mormon dwell together harmoniously. The towns around which the Mormon farms are centered include Manassa, Sanford, La Jara, Richfield and Romeo. The Excelsior and Carmel communities, too, are largely Mormon.

A NEGRO COLONY.—Unique among farm colonies in Colorado is the Dearfield Colony in Weld County, composed of negroes. Oliver T. Jackson is the founder of the colony. Jackson was born in Ohio, of parents who had been slaves. He came to Colorado over twenty years ago and became a leader among the people of his own race, taking a prominent part in politics. He served as governor's messenger through the Shafroth and Ammons administrations.

His ambition was to do something for his own people to aid them toward economic independence. He followed the example of Booker T. Washington and decided to organize a colonization movement, and find suitable land which could be homesteaded, or bought reasonably. He succeeded in locating a large body of such land in southeastern Weld County and in the course of several years he induced some seventy-five or eighty families to locate there. Two villages have been established, Dearfield and Chapelton, the first-named being about two miles from the Union Pacific station of Masters.

These settlers have come from various occupations, some having been tenant farmers in the cotton districts of the South, others in employment as Pullman porters, or as family servants, or in other wage-earning work which gave them little opportunity for independence. On the farm they are at least self-supporting from the products of the soil and some are now quite well-to-do. They are encouraged to build up small dairy herds, and each family has a flock of chickens and turkeys. Milk, eggs and poultry are a ready source of cash income for them, besides supplying their tables. The land is not irrigated, but these negro farmers have done as well on it as any other community similarly situated. The colony has proved successful and permanent.

*Correspondence from Alamosa to Denver Tribune, July 29, 1880.

COLONIZATION OF FARM LABORERS

There has been some accretion to the substantial farming population of the state through foreign labor, principally of the German-Russians. The first arrivals of these people did not come directly from Europe, but were brought to Colorado from the vicinity of Lincoln, Nebraska, where they had been colonized. They were originally of German stock, their ancestors having emigrated from Germany to Russia.

When the beet industry got started in northern Colorado in 1901 the labor question was one of the first problems to be solved. The Great Western Sugar Company was in position to solve it and the company sent agents to Nebraska to recruit labor for the beet fields. These first-comers proved excellent laborers. They established themselves in their own little settlements near sugar factories, working in the fields during the growing season and at harvest and then coming to town in winter to work in the sugar factories.

They are a thrifty, hard-working people, with no intention of remaining in the class of farm labor, but laying by out of their earnings sufficient to start as tenant farmers, a few years after first taking beet labor contracts. In the first years of the industry German-Russians were almost the sole source of beet field labor. The original comers were instrumental in inducing friends and relatives to emigrate from Europe and their numbers increased considerably until the World War intervened.

While the number of German-Russian beet laborers is now much diminished, there were still 50,000 acres of beets worked by them in 1918, but only about 25,000 acres in 1925, Mexicans having superseded them.

MANY NOW OWN FARMS.—The Russians have remained in Colorado, many having graduated out of the tenant into the farm-owning class and some into the landlord class; that is, owning more than one farm and themselves employing beet labor on a large scale. It is estimated by an authority on the beet labor question, Mr. C. V. Maddux, Labor Commissioner for the Great Western Sugar Company, that about 4,000 German-Russians who came to the state as beet laborers, are now farm owners.

In the early days their graduation from laborer to farmer was even more rapid than in recent years, for the reason that, since 1918, there have been no new immigrants, and those remaining as laborers now are usually people lacking managerial ability, or an opportunity to get a start for themselves.

The German-Russians, as stated, are being supplanted by people of Spanish origin, some being of the true Spanish type, others the Mexican, in whom native blood is dominant rather than the Spanish. There is an

absence of definite records of their advent as beet field laborers, though Spanish labor has been common in southern Colorado on the farms and ranches ever since the earliest settlement. In northern Colorado, the Mexicans, as they are generally known, were first employed at railroad and quarry labor, but here and there they were seen on beet farms. Having proved themselves efficient, it was but natural that the industry should look to them for a supply of labor when the German-Russian supply failed.

SPANISH-AMERICAN LABOR.—The first Spanish-Americans came into the northern beet districts about 1905 in small numbers and mostly from southern Colorado and New Mexico. Up to 1915 this movement was relatively small. In that year, however, when the demand for labor to supplant the Russians was urgent, Mexicans were able to supply it. They came then on their own initiative, but as the need for larger numbers developed the plan of shipping in at company expense was used, as it had been for the



Mexican laborers topping beets at harvest.

German-Russians in recent years. Shipments of both classes thus brought in have come from the Missouri River on the east and southward as far as the Texas-Mexican border. Under this plan it has been customary to furnish transportation free from place of engagement to place of employment. No labor has ever been recruited outside of the boundaries of the United States, though that would have been legal during certain brief periods immediately following the war, under a waiver granted by the government because of a labor shortage.

The Mexicans have proved as adaptable and as efficient for the hand work in beet labor as the Russian-Germans. In the labor contract at present in use (1926) for northern Colorado, the basic price is \$24 per acre, with a bonus of 50 cents. In the early years the contract was \$20, an acre without a bonus and at one time it was \$18. The labor performed includes bunching and thinning, hoeing, weeding and pulling and topping the beets. It is such labor as the American farmer will not do, hence labor of foreign extraction is essential in the industry.

JAPS, GREEKS AND INDIANS.—In the Arkansas Valley the first beet labor was local Mexican and a few German-Russians. A few years later Japanese were brought in and also some New Mexican Indians. About 1908 Greeks were employed on some farms and for several years this mixture of races and nationalities continued to make up the bulk of the labor. By 1914 the thrifty German-Russians and the equally thrifty Japs were farming for themselves and thereafter the plan of northern Colorado was followed of recruiting Mexican labor, which is the type employed at this time.

In the San Luis Valley Mexican labor has long been recognized as the most efficient for the potato fields and for other farm and ranch purposes and in the sheep-raising industry Mexican herders are in the majority, as they are capable shepherds. No other nationals are drawn on in any considerable number for farm labor in Colorado at this time.

TRANSIENT AMERICAN LABOR.—Wheat harvest, hay harvest, work in the truck gardens of the Arkansas and Platte Valleys and fruit picking in the commercial orchard districts of the Western Slope rely on the usual transient seasonal movement of American labor, plus that available from nearby sources. All farm labor in Colorado is unorganized from the labor side, but, in the main, well compensated from the employing side, with established scales in wheat harvesting and threshing and the written contract form on a seasonal basis in the sugar beet industry. Even during the war period when Northwestern states were overrun with agitators of the I. W. W.* there was little evidence of disturbance in agricultural labor in this state.

CHILD LABOR QUESTION.—The question of child labor in the beet fields of Colorado has attracted national attention, through the efforts of welfare organizations to stop it. Under the contract system of working sugar beets during the growing and harvesting seasons, family labor is employed and the contract laborers, of foreign birth, principally German-Russians, use their own children as helpers in thinning and topping. In some instances

*Industrial Workers of the World, an anarchistic order, advocating sabotage.

very young children have been so employed, and in considerable numbers. The beet laborers of this nationality usually have large families and they do as their ancestors did in Europe and as they themselves experienced in childhood—work the youngsters in the fields as soon as they are able to comprehend and do the tasks assigned them. They work in family groups, with the mother supervising the children and doing her own part in making the family living.

Several surveys have been undertaken by different agencies to obtain data on numbers, hours and type of employment, as well as effect of this on school attendance, these agencies including the Federal Children's Bureau, independent welfare organizations and the State Agricultural College. There has been some tendency to overemphasize the seriousness of the problem. The labor is in the open field; it is not hired labor but family labor, and the results, as far as the family is concerned, are financially beneficial. Beet contract labor is a step in the process of taking European peasants, who have known no independence for generations, out of the bondage of perpetual labor, toward farm ownership and American citizenship.

Labor of very young children in the fields is growing less, as the various local agencies of church, school and community are making themselves felt. The change in the economic condition of the labor families is of itself effectively raising standards, and the condition is yielding to these influences more readily, probably, than it would to drastic social legislation. That, at least, is the view of Colorado farm leaders, who have opposed federal control of child labor.

CHAPTER XI

Crop Chronology and Events of Import to Agriculture

ALFALFA INTRODUCED IN 1863

FIRST GROWN IN DENVER.—Alfalfa was first sown in Colorado in 1863, in the city of Denver. The first sowing on a farm was in the Clear Creek Valley, about 1867. Active spread of the crop was begun by the Union Colonists at Greeley in 1872. The seed sown in Denver was brought into the state by Major Jacob Downing, who procured it in Old Mexico while on a military mission during the Civil War in 1862. He was in command of four companies of Colorado Volunteers, stationed on American territory at Mesilla, New Mexico. He procured the seed across the border from El Paso in the Mexican state of Chihuahua.

On his return to Denver Major Downing planted the seed in the doorway of his law office, Twelfth street at Holladay, since renamed Market street. The alfalfa thrived, and it was the influence of this little patch of green that persuaded Major Downing, in later years, to grow the crop extensively on his Green Mountain ranch near Golden.

While the fact about this early planting is mentioned in Bulletin No. 8 (July, 1889) of the Colorado Experiment Station, the present historian has tried to clear up all doubt by tracing the information to responsible sources. Lucius M. Wilcox of Denver, who for thirty-five years was editor of *Field and Farm*, repeatedly discussed the subject with Major Downing in the early eighties. Careful record was made in *Field and Farm* at that time of the origin of alfalfa growing, as credit for introduction of this, intrinsically the most valuable of all Colorado crops, was even then a matter of controversy.

Downing claimed no credit for spreading knowledge of the crop during the first decade after its introduction. He was a lawyer by profession, a fifty-niner in Denver, taking an active part in organization of the first citizens' government and officiating as the first judge of the Municipal Court. At the outbreak of the Civil War, Downing aided in raising the First Colorado Volunteers, and with that regiment he took an active part in the campaign in New Mexico, during which period he had occasion to cross the border into Old Mexico.

ON THE RIO GRANDE TWO HUNDRED YEARS.—Alfalfa had been grown along the Rio Grande at least two hundred years. The crop was introduced by Spanish colonists on this continent over three centuries ago.

Discussion over its Colorado history was aroused in June, 1886, when the American Agriculturist (New York) published an article from Colorado in which the statement was made that the plant was first seeded in this state "eight years ago." In correcting this misstatement Field and Farm (June 12, 1886) said: "To our certain knowledge Major Jacob Downing had alfalfa sowed in his dooryard as early as 1863, and the next year L. K. Perrin sowed five pounds of California seed in his fields. This seed was furnished by Mr. Perrin's brother, who had made a great success of it in the Sacramento Valley. As far back as 1872—fourteen years ago—the colonists of Greeley were sowing alfalfa and some of the original meadows still produce fine stands of it."

This statement, it seems, was not sufficient to clear up the matter; and again, in the issue of June 30, 1888, details are given in the effort to fix the facts historically. That article is herewith reproduced:

CLEARING UP DOUBT.—Of late, considerable discussion has been going on in some of our rural exchanges regarding the history of alfalfa in Colorado. So far, the stories published, read very nicely and all that, but none of them are correct as to who first brought in and introduced alfalfa. To place this matter right, we will state that Major Jacob Downing of Denver is the father of lucerne growing in this state. In 1862, he went to Old Mexico, on military business, and on returning, brought with him a small parcel of alfalfa seed. This was planted in the yard back of the Major's office on Twelfth Street, near Holladay, and there grew and flourished for years.

Long before 1870—in 1867, we think it was—* Mr. L. K. Perrin received some alfalfa seed from California and started a good stand on his farm near Cherry Creek. This stand is growing yet. In the fall of 1871, Major J. C. Feebles sent to California and received by freight, the charges amounting to \$95.00, a consignment of alfalfa seed which he distributed among his agricultural friends around Denver. The stands from this seed are all growing and doing finely today.

The first alfalfa planted on the Greeley colony was with seed purchased in Sacramento, California, by H. T. West, who gave out something like sixty pounds to his neighbors, J. L. Dunham, Richmond Fisk, N. B. Knowles, S. K. Thompson, and N. C. Meeker, who planted it all and succeeded in getting the great forage crop fairly started on the way to its present magnificent proportions. Mr. West is entitled to the credit of introducing alfalfa on the Greeley colony, but the honor of having first planted it in Colorado goes to a Denver man, as we have herewith briefly described.

WILCOX CONFIRMS IT.—After a lapse of thirty-eight years the above article was reread to Mr. Wilcox, who has been blind many years. He readily recalled in 1926 the circumstances surrounding the publication of that article and having visited the Green Mountain ranch, where the five-hundred-acre field was being grown in 1886 and the crop pastured by hogs. It was then the largest field of alfalfa in Colorado. Both Wilcox and his

*Apparently there was doubt as to the exact year of Perrin's introduction, the previous article by Field and Farm, indicating 1864. There may be an error also in stating location of Perrin's farm "near Cherry Creek." Possibly he had two farms, but the home farm was in North Denver, in the Clear Creek district.

associate on Field and Farm, L. B. Cutler, wrote about Downing's alfalfa, the large acreage attracting general attention in those years.

Two years before, under date of April 25, 1884, the Colorado Live Stock Record said: "Major Downing on his Green Mountain farm eight miles from Denver will this year have more acres of alfalfa than any other man in Colorado. The major was the man who first introduced the plant in Colorado and will probably be the first to make a fortune off it. If he has a good season's growth of the feed this summer he will fatten 1,000 head of oxen the coming winter on hay, besides taking care of his thoroughbred horses and the colts he is raising."

DOWNING DISCUSSED IT.—The subject was given mention in Field and Farm again under date of December 8, 1894, by Major Downing himself. He discussed the history of the plant and continuing said: "It was then, upon the discovery of America, brought here by the Spanish priests and planted here on their missions, so that it is now found in all Spanish America. I introduced alfalfa into Colorado in 1863 and have between 500 and 700 acres. * * * I have seen, near the City of Mexico, fields of alfalfa 300 years old that have been constantly cropped and never re-seeded."

Ten years later Major Downing again contributed an article to the same publication, going into minute detail as to his introduction of the crop. The article, published February 4, 1905, follows:

HOW ALFALFA CAME TO COLORADO.—In reply to your request, I will briefly give the history of the introduction of alfalfa into Colorado. In 1861, I joined the First Regiment of Colorado Volunteers and on the 22nd day of February, 1862, we undertook a forced march to New Mexico to assist General Canby who had been defeated and needed reinforcements. After a number of engagements we succeeded in driving the enemy back to Texas. From Fort Craig I marched with four companies under Colonel Howe, down to Mesilla Valley and there learned that in Chihuahua, near the Rio Grande, a ranchero was raising alfalfa. I procured about two ounces of seed. In the spring of 1863, I planted this in my yard in West Denver. I had a very reliable colored boy who irrigated it with a watering pot and it grew splendidly, convincing me that it would be a success in Colorado.

After I had become satisfied, I went to J. W. Sweeney and Co., of San Francisco, but I could only procure one hundred pounds of seed, costing twenty-five cents a pound, with fifty cents a pound for freight. This I sowed on my ranch near Green Mountain, in Jefferson County. I soon had more seed sown and after a time was able, through Henry Lee, the pioneer seedsman of Colorado, to obtain a larger quantity of seed, until I had four hundred acres of alfalfa. My horses thrived while eating it greedily. Still the people would not adopt it. They said it would ruin the land. Some said I was a book farmer, while they were practical farmers. I had to run the gauntlet of ridicule and abuse. A man who was conducting what he called an agricultural paper denounced it as a fraud while he knew nothing about it. All this was discouraging but I continued to persevere till one day the late Captain Cutler, editor of Field and Farm, asked me when I was going to the ranch. I told him I was going that afternoon to return in the evening. He said he wanted to see the alfalfa. He went and being a broad minded man said he thought this would save Colorado agriculture.

"But," he said, "why do you want me to boom it? You have the monopoly of it." I told him: "I have four thousand acres of land near Box Elder, some land on Sand Creek and Clear Creek and my ranch. If I can raise the price of land from five

and ten dollars to fifty dollars an acre or more, I can make more money on the land than I can on a monopoly in a hundred years." "All right," he said, "I will boom it." In two years from that time nearly five thousand acres were planted in alfalfa. * * *

DIDN'T LIKE THE CROP.—The seed brought in by J. C. Feebles proved an important contribution to the spread of the crop in the Platte Valley and its results were apparent a few years later when alfalfa became a topic of discussion at farmers' meetings. Opinions varied as to the value of the crop, some contending that it had little virtue, while others saw its importance as a soil builder as well as for pasture and hay. At a meeting of the Denver Farmers' Club, in February, 1873, J. Y. Dillon said he had planted some alfalfa but would not do so again. He said his great trouble was to get rid of it, as it seemed almost impossible to kill it. He had no doubt it would stand drouth better than any other hay crop, as it was deep-rooted and required little moisture after getting started. Other farmers, too, were doubtful, some declaring that it grew too large and coarse for stock as hay, and that unless cut when quite young and tender it might be regarded as almost worthless for feeding purposes.

Such opinions as these, published from time to time, brought more definite suggestions from experienced farmers regarding the growing of the crop and the necessity for frequent cutting. Gradually farmers became accustomed to a plant that was altogether new to them in its peculiar habits of growth and in the astonishing tonnage of hay it yielded under proper watering and tending. The average farmer knew nothing of its antiquity and many had yet to discover its rare nutritive qualities. The discovery of the fixation of atmospheric nitrogen by legumes had not then been made.*

WORKMEN FOLLOW A ROOT.—An incident related by Lucius M. Wilcox to the writer in 1926 attests Major Downing's faith in alfalfa. Not only did he sow it in his office yard, but he also seeded the ground around his cottage at Eighteenth and Lawrence streets, Denver, in the latter sixties. In later years an excavation was being made across the street from the old Downing cottage, when the workmen encountered a root, over which an argument arose as to its origin. A bet was made and to decide it they followed the root, which, instead of leading to a cottonwood tree, as asserted by one of the men, ended in the crown of an alfalfa plant in front of the Downing cottage. The root measured thirty-two feet in length. It was put on exhibition in a real estate office, where it attracted much attention.

GOVERNOR HUNT TRIED ALFALFA.—Another bit of proof that alfalfa in Colorado started in the Platte Valley comes in a letter written to N. C.

*The subject of nitrogen gathering by legumes was cleared up with the publication in 1886 of the researches of Hellriegel and Wilfarth and the work of Boussingault and others. See "The Book of the Rothamsted Experiments," by A. D. Hall; John Murray, Publisher, London, 1905.

Meeker by Governor A. C. Hunt and dated in November, 1870. This letter was published in the Greeley Tribune of December 7, 1870 (Vol. I, No. 4). Meeker, then editor of the Tribune, had written to Governor Hunt, who had pioneered as a farmer in what is now west Denver, asking about clovers.*

Hunt's reply says: "My first successful experiment was with a small piece of land measuring about one-eighth of an acre, sown one-half with common red and the other with lucerne or blue Mexican. This piece supplied almost the entire summer feed for two cows, during three summers, being cut three and four times in one season. In August, 1869, I sowed one-half acre of common red, slightly mixed with white. This was well seeded, came up and nearly covered the ground before winter set in."

The reference to lucerne or blue Mexican, of course, means alfalfa. The inference from the letter is that it was grown on Hunt's Denver farm prior to 1869—probably as early as 1866.

UNION COLONISTS SKEPTICAL

It took time to convince the Union Colonists of the value of alfalfa. In 1872, under date of July 17, the Tribune said: "Alfalfa clover is not much esteemed; it looks like a weed. Possibly it may amount to something; if it does, we shall say so. Alsike clover is a jewel. It seems as good as red clover, and is lovely for bees."

But two years later alfalfa had impressed itself on many doubting farmers to whom the rapidly growing legume seemed almost too good to be true. Meeker had confidence in the judgment of L. K. Perrin, the Clear Creek pioneer farmer, who had so readily co-operated in the organization of farmers' clubs and had taken Meeker's suggestions along that line. Perrin's experiments with alfalfa were discussed in *The Colorado Farmer* during April, 1874, and Meeker reprinted the article in *The Greeley Tribune*, so that the colonists might have the benefit of it. Perrin was called "one of the best and safest experimenters in the territory," and it was stated that he had an acre of alfalfa then in its fourth year. He informed *The Colorado Farmer* that the plants had made a growth of five inches already that spring and that it was good picking for stock thus early. He had sowed it too thin, he said—about eight pounds to the acre—but that in the previous season he had cut it three times, getting each time about one ton. His intention in future was to sow about twenty-five pounds and perhaps get four cuttings a season. Evidently Perrin had experimented with small patches two or three seasons before sowing an acre, as his first seed was obtained from California in time for sowing in 1867.

*The Hunt homestead is now Lincoln Park, Denver.

TENNEY TRIED IT IN '72.—About the same time that the Union Colonists were starting with alfalfa, seed was sown at Fort Collins by R. Q. Tenney, who got his supply in 1872 through J. C. Feebles of The Colorado



Alfalfa field on C. C. Stitt's irrigated farm near Fort Morgan

Farmer. This, too, was the year in which the farmers at Longmont gave attention to alfalfa and discovered its value.

The first alfalfa grown in the Arkansas Valley of which there is any record was on the farm of George Gilbert of Pueblo, who sowed it in 1868. While this statement is unconfirmed, it came in a letter from G. W. Swink, a pioneer at Rocky Ford, to D. W. Working, under date of March 23, 1901. Swink wrote: "Mr. George Gilbert of Pueblo tells me he planted some (alfalfa) in 1868, but there wasn't any planted in this neighborhood (Rocky Ford) till the spring of 1877; that I planted and it remained until 1900; then we plowed it up, though it was a good stand yet."

M. H. Henry of Niwot is authority for the statement that Charles Baldwin, who came to Colorado in 1868 from California, brought alfalfa seed and planted it on his ranch on land now covered by Standley Lake in Boulder County. Henry says he saw alfalfa growing there in 1871.

MANY CLAIM THE CREDIT.—No crop has developed so many claimants for the honor of introduction as alfalfa. Often those to whom the credit was given did not set up the claim personally, but found themselves victims of the zeal of their friends. In most instances these errors were due to the

fact that those given credit were the first to sow alfalfa in a particular locality and from them the community received its knowledge and thus the crop was spread in that locality. This was natural in a region like Colorado, where farming districts, particularly in the early days, were not contiguous, and communication between localities in separated regions, often with mountain ranges intervening, was difficult, hence infrequent. One newspaper article makes John Brisben Walker, gentleman-farmer and publisher of magazines, the "father" of alfalfa growing in Colorado.

According to this yarn, Walker, while glancing through the "A's" in the encyclopedia, saw the word "alfalfa," and becoming interested from reading the historic account of the valuable legume, "thought it would be a good thing to try in the West." So he procured some seed and planted it on the Walker ranch in the suburbs of Denver and "soon alfalfa was selling at fancy prices in Denver."

Walker had a large field of alfalfa in 1881, and it may be true that he planted the crop without knowledge of the fact that others along the Platte had been growing it for years.

Another story comes from the San Luis Valley, where a cowboy who had driven cattle in Brazil told the ranch owner of the wonderful South American lucerne. A packet of seed was sent for, and thus was alfalfa established in the San Luis Valley. Similar stories were told of the Arkansas Valley and of the Poudre Valley. In the Union Colony of Greeley several versions of the origin of alfalfa in Colorado are still current. However, this can be said of the Union Colonists: whatever they took up that proved good they talked about and their propaganda in the early days through *The Greeley Tribune* and *The Colorado Farmer* certainly aided in spreading information about alfalfa and its value to agriculture. The early files of these publications, as well as the later ones of *Field and Farm*, leave a clear chronology of the introduction and progress of the crop.

"Every farmer who has not a patch of alfalfa clover, should look at his neighbor's, and the sight of its rich, green stems, ten inches high and full leaves at this early date, will convince him of its value. In two weeks it may be cut for hogs and even for horses."—*The Greeley Tribune*, May, 1877.

FIRST SCIENTIFIC DISCUSSION.—Reference has already been made to Bulletin No. 8 of the State Experiment Station (July, 1889), which constituted the first scientific discussion of the plant issued in Colorado. The conclusion recorded in that bulletin was: "We believe alfalfa to be the best forage plant for Colorado, and the whole arid region." Reasons were given for the conclusion, including the following: It is easy to grow; has good staying qualities; yields exceed other hays; is as digestible as clover hay;

rich in "strong food" when properly cured; feeding qualities and palatability excellent; good flesh and milk producer. It was stated that alfalfa flourishes at all altitudes below 7,000 feet.

The next bulletin on the subject, No. 35, was issued September, 1896. This was by Dr. Wm. P. Headden. It comprised one hundred pages and was undoubtedly the most exhaustive study of the plant made by any experiment station up to that time.

The range of altitude for alfalfa had gone upward, Dr. Headden having seen it at 8,637 feet on the eastern slope, at 7,900 feet in the San Luis Valley (a fourteen-year-old stand) and it had also been successfully grown above Telluride, altitude 8,500 feet.

FAMOUS BULLETIN 35.—All phases of growth, composition and use of the plant were discussed in Bulletin 35, this discussion being based on analyses made and recorded in the bulletin. After mentioning that the history of the plant goes back to 381 B. C., its antiquity being proof of its great value, the author took up in turn its culture, varietal differences, chemical composition, the composition and the food value of the different parts of the plant, comparison with clover hay, red clover and pea-vine ensilage, elements of plant food taken from the soil, analyses of seeds, amounts recommended for sowing, question of what is a good stand, vitality of seed, depth attained by the roots, age of stands, nodules, ratio of roots to tops, stubble and its manurial value, manurial value of roots, leaves and stems as a top dressing, analyses of soils in which alfalfa has been grown, effect of seepage on roots, etc., etc.

The work was done with the thoroughness that characterizes all of Dr. Headden's research into the problems that have come under his scientific scrutiny in thirty-three years of activity on the experiment station.

The value of the crop had been universally recognized in all irrigated farming districts of the state by that time and its history thenceforward was a record of progress in extension of acreage and uses in feeding as well as a fertilizing crop. It represents at present about 60 per cent of the state's tame hay acreage and has a money value approximating \$15,000,000 a year. Figures, however, do not tell the whole story of alfalfa. If it were taken out of the scheme of agriculture in the irrigated districts of Colorado the bottom would drop out of farming.

POTATOES WERE A GOD-SEND

EMIGRANTS BROUGHT THEM.—Potatoes proved a veritable god-send to the settlers a year after the gold rush began. Wagon trains, as a rule, were well supplied with potatoes, and when any were left at the end of the long journey across the plains a few were saved for seed, especially by

people who had come from the farms and small towns of the States. In those years scarcely any family was without a garden "back east," in all but the large cities, consequently most people knew the value of whatever seed stock they had left when at last they reached the settlement at the mouth of Cherry Creek, or the other spots that were being built up as centers of population. There were many families, therefore, who had potatoes, and some were planted in gardens as early as the spring of 1859 and many more the following season.

As has been related in the chapter on irrigation, the first farms included potatoes as well as wheat and corn in their list of crops. The fact that the wild potato was indigenous to Colorado, at least to the southwest region of the territory, was unknown to the arriving emigrants. They did not know that certain Colorado soils and sunshine, plus water, would produce extraordinary yields of potatoes, and their astonishment was great when they dug their first potatoes. They were surprised at the size of the tubers and the great number in the hills, as well as at the strong, bushy growth of the vines in the sandy bottoms along the Platte and Cherry and Clear Creeks. These settlers at Denver did not know that potatoes had been grown on the occasional isolated farm or ranch at trading posts and trappers' rendezvous, so to them it was a revelation when they saw tubers weighing as much as two pounds and bigger than two fists, grown from their own seed, which, back in the States, had come from stock that produced potatoes only half that size.

PARKINSON FIRST GROWER.—While it is known that many people planted potatoes in gardens and a few on their farm claims in 1859, it is said that William Parkinson was the first grower in the Platte bottoms, in the season of 1858. According to an account that was published in 1888, Parkinson planted potatoes just below the town of Denver. "To that time it was not known that potatoes could be grown successfully at an altitude of 5,000 feet above the level of the sea. Mr. Parkinson, to try the experiment, shipped by express the eyes of some Neshannock potatoes from Virginia, put them in the earth in the river bottom in May, and in October harvested 150 bushels from a single acre and of much finer quality than was the original stock."*

The Neshannock seems to have been a popular variety about that time, being frequently mentioned in the newspapers. It was a potato of that variety that received the first press notice when H. H. McAfee took it to the office of *The Rocky Mountain News*, the middle of August, 1860, for display. This item read as follows: "H. H. McAfee yesterday placed upon our table a potato grown in his garden near this city that measures 4½

**Field and Farm*, August 4, 1888.

inches in length and $2\frac{3}{4}$ inches in its cross diameter. It is of the Neshannock variety and was grown in Clear Creek Valley without irrigation."

Potatoes were selling at only 20 cents a pound on the frontier markets in the early summer of 1860, before the gardens were ready for digging, so there was apparently no great dearth of "spuds." Flour was, however, very scarce and high, being quoted at \$20 to \$25 a hundred in Denver. Emigrants were arriving at the rate of nearly a thousand a day, so the food supply was a problem. This prompted much gardening activity. While single potatoes of unusual size were objects of curiosity in 1860, by the following year it took more than one "spud" to stop the crowd in front of a store window.

FOUR-POUND POTATOES.—In 1862 (The Commonwealth, October 9): "J. M. Brown, eight miles up the Platte, brought a big load of potatoes to town, leaving two at Hawkins' store on Blake street which weighed four pounds a piece." And two weeks later C. H. McLaughlin capped the climax with a five-pounder that stopped the crowd and turned many from gold dust hunters to "spud" growers. The Denver Commonwealth of October 23, 1862, is responsible for the story of the five-pound potato, and in the same issue it is related that Robert Gordon "three miles down the Platte," raised a hill of Peachblows that totaled twelve and one-half pounds, one potato weighing four pounds. These accounts and the sight of the potatoes which were brought to the stores by the gardeners stimulated production, so that in 1864 The Rocky Mountain News* made record as follows:

Potatoes are thus far the great staple in the line of vegetables. Probably in no country except in California in its early days and in the neighborhood of large cities, can such fields of potatoes be found as in Colorado. In some instances, a single farmer raises his 50 or 100 acres of potatoes. In ordinary seasons the yield is quite large—an average, say, of 200 bushels to the acre; many fields turn out much more and we have seen dug from measured ground over 600 bushels to the acre. The varieties mainly cultivated are the Kidney and the Neshannock with an occasional Peachblow. The Pinkeye has proved a failure. Many specimens grow to an immense size—4, 5 and even 6 pounds to the potato being a not uncommon weight. The crop is usually plowed in, is easily cultivated and requires comparatively little irrigation. The secret of the extensive production of potatoes lies in the fact that the mining settlements where vegetables cannot be raised, create a large demand and they are the easiest crop transported and kept for winter use.

That sums up the case for potatoes along the Platte. And what was true there came to be common very soon on the upper reaches of Cherry Creek, on the Kiowa and on Monument and the Fontaine, in what was called "the Divide" country, which in later years became one of the largest potato producing sections.

In 1868, at the third annual territorial fair in Denver, there was an exhibit of a bushel of potatoes containing just fifty-three "spuds." At that

*Rocky Mountain News, April 13, 1864.

time the retail price was 2 to 3 cents a pound in Denver, as potatoes were plentiful. In that year the Pueblo section was getting a good start in agriculture, The Chieftain reporting a call from John J. Sease of the St. Charles,* who brought in a potato weighing over two and one-half pounds and told the editor that he had raised 150 bushels on two-fifths of an acre.

COLORADO'S FIRST POTATO "KING."—Colorado early had its "potato king," this uncrowned monarch being Rufus H. Clark, nicknamed "Potato" Clark, because of his success as a grower. Clark's farm was on the ground now included in Overland Park, Denver, then several miles up the Platte from the city, but now overtaken by the growth of the metropolis. Clark did not contribute in any way to improvement of potatoes, nor is there any record to indicate that he was other than a commercial farmer. However, he made a financial success of potato growing, and he supplied Denver and the mining camps with tons of good food, which is enough of an accomplishment.

He was somewhat of a public character, taking an active part in affairs and doing his share as a citizen when any crisis presented itself in the pioneer community.

At the time of the Chicago fire in the fall of 1871, Clark set the pace in contributions for fire sufferers by driving to Denver with a load of potatoes. It happened to be digging time, in October, and when Clark heard of the conflagration that destroyed the greater part of Chicago he decided to do his share by contributing a part of his crop. He drove up to Salomon Brothers store with them and at someone's suggestion decided to sell the potatoes at auction. The Salomons contributed sacks and the "spuds" were put into them and the sale started, with Clark as the auctioneer. There were ten sacks to sell and after an hour's spirited bidding \$143 in cash had been realized. The head of the Salomon firm had bought one sack, but he turned it back to Clark for resale, and after more bidding it was finally disposed of for \$270, the highest price paid for a sack of potatoes up to that time—and perhaps never equalled since. Sporting blood was strong among the pioneers, and the morning's fun, with "Potato" Clark as auctioneer, gave the crowd a taste of speculation, so it was decided to continue the auction after dinner and raise more money for the fire sufferers.

Afternoon came and Clark was again on the box and around him were stacked the offerings of the pioneers, which included a silver pitcher, two boxes of cigars, five sacks of Colorado flour, a hat, two pairs of boots, a case of Missouri Catawba wine, two pictures, three chromos,† one barrel

*On the territorial maps, this stream was designated by its Spanish name, San Carlos.

†The distinction between picture and chromo was made by the newspaper reporting this event!

of apples, one writing desk and a box of oysters. Everything was sold and at good figures, the hat heading the list at \$46. There was nothing more in sight to sell, so Clark picked up the sign upon which the auction sale had been announced and "knocked it down" to Mayor Harper for \$7. The total afternoon sales netted \$885 in cash. By that time word had gone to the country and the farmers came in for the evening, bringing their offerings, which included a buck and four ewes and 500 pounds of seed wheat. Other articles sold at the evening auction, with "Potato" Clark still in good voice and spirits, included a buffalo robe at \$40, five \$1 bills, each put in the mouth of a trout, and a can of oysters, the latter bringing \$12. In two hours \$560 in cash came in for every conceivable article. It was the fun of giving and raising the other fellow's figure that held the crowd. The fact that the cause was good added to the zest of the auction. A draft went to Chicago that night from Mayor Harper of Denver for \$7,220, which included besides the auction money the general contributions. "Potato" Clark's good-natured flow of speech on the auction block opened the heart and purse of Denver.

Colorado people were well aware of the quality of home-grown potatoes and they had become a staple farm and garden product. Platte Valley farmers had competition in supplying the Denver market from the Arkansas Divide, as well as in the Boulder, St. Vrain and Big Thompson Valleys. Potatoes were hauled by wagon for fifty miles or more, as time was a slight consideration with the pioneer farmer, who usually exchanged his produce for groceries and dry goods.

GREELEY GETS A START.—Not until the Union Colony got a good start did potatoes figure as a crop that was exported beyond the borders of the state. There, too, in the first years, the market for surplus potatoes was Denver, Central City, Black Hawk and other east slope mining towns.

Just who grew the first potatoes commercially at Greeley is a matter on which one may have choice of several accounts, two of which are quite definite, that relating to John A. Gordon and the other to H. C. Watson. John A. Gordon is a pioneer well known to the surviving Union Colonists. He left Colorado to engage in ranching in Wyoming. Later he took charge of a government experiment station near Cheyenne, and in 1926 was living in retirement in California. As late as August in the year of the publication of this volume, The Greeley Tribune published a communication from Charles Camp at Long Beach, California, going into details as to the Gordon claim for being the first to grow potatoes for sale at Greeley. According to Mr. Camp's letter, Gordon's patch was grown from seed which Andrew Gilchrist brought with him from the East in the Spring of 1870. The patch was plowed by John Gordon and A. M. Driver, using a team

belonging to J. H. Orr, Gilchrist furnishing the seed. The ground was in the river bottom northeast of town, near the present concrete bridge over the Cache-la-Poudre. Camp's letter states that these potatoes were not irrigated. A good crop was produced and the growers used some on their own tables and sold the rest.

In the following year there was more extensive planting of potatoes and the yields were astonishingly large, as they had been in certain spots around the earlier settlements up the Platte. The Union Colony farmers were quick to realize the value of potatoes as a cash crop. In the fall of 1871 The Greeley Tribune began to publish potato marketing items. Under date of October 11 it was stated the Eaton Brothers had raised 800 bushels on five acres, a part of the land yielding at the rate of 400 bushels to the acre. Hogarty Bros. had contracted to deliver 25,000 pounds at Greeley at \$1 per bushel f. o. b. cars for shipment to the garrison at Fort Russell, Wyoming.

WATSON DEVELOPED MARKET.—Another account of the beginning of potato growing in the Greeley district is that related by Senator H. C. Watson, who came with the first Union Colonists in May, 1870.* Noting the pressing need for food, Watson hired a man to plow up some lots which, though on high ground, were still under the ditch, construction of which was under way. Watson had bought some Early Rose potatoes at Evans, which was then the terminus of the Denver-Pacific Railroad, paying three and a half cents a pound for his seed. He left his potato patch to others to look after while he went up the Cache-la-Poudre on a log-cutting expedition. The crop was poor, but it was shown that potatoes would grow and Watson got enough out of them to pay for seed and labor. Both Gordon and Watson grew potatoes for market that first year; probably others did also. Watson did a great deal later on in developing a commercial market for potatoes.

About 1875, when he was employed in a mercantile establishment at Greeley, Watson made frequent trips to Denver to sell potatoes. On one of these trips he wrote an article for the Rocky Mountain News, which brought the quality of Greeley potatoes to the attention of consumers and laid the foundation for the reputation later established for them.

In 1881 Watson went into business for himself as a dealer in produce. Five years later he was instrumental in organizing the Greeley Mercantile Company of which he became vice-president, and on the death of O. P. Gale he succeeded the latter as president in 1887. In that year the firm sent a man to Texas to develop a market for potatoes, the surplus in the territory along the Platte north of Denver having reached 1,500 cars.

*From "The Potato," by E. H. Grubb and W. S. Guilford, Doubleday Page Co., Garden City, N. Y., 1912.

"We found that we had about reached our limit," Senator Watson's statement continued, "as water from the streams would not hold out for late irrigation; that is, in August. This made it necessary to build reservoirs to store flood waters and the winter floods of the streams."

"We were not raising much over 100 bushels to the acre, as the soil lacked humus and nitrogen. A farmer from Iowa by the name of Bliss* concluded that he would try turning under alfalfa, as they did clover in the East. Now our farmers were of the opinion that you could not get it to rot, as it came right up again, but he managed by putting chains on the plows to turn the plant under. The result was astonishing, as it just about doubled the crop, not only of potatoes but of everything else."

Lord Ogilvy, for many years agricultural editor of the Denver Post, had been engaged in ranching and farming in the Greeley district at the time when the potato growers were learning things about the crop. Quoted in "The Potato" (Grubb and Guilford) he said: "The soil so rich in mineral elements was deficient in humus, and it was not until alfalfa had been grown some years that any tonnage (of potatoes) was produced except here and there. The breaking up of alfalfa at first gave an excess of humus, in that it forced vine and early growth; the tubers set on and matured during excessive heat of summer. An occasional run or two of river water at the right time gave heavy tonnage and indicated what was to be."

Experience with potatoes in the Greeley district was similar to that in other sections where the crop flourished for a time and then declined, as yields fell off without apparent cause. In the first years of the Union Colony this variableness in yields from season to season was recognized and questions were asked as to the cause. It was typical of the Greeley farmers to find out why; they were never satisfied to take things as they came, and this characteristic is one reason for the great success that has attended farming in that locality. Not that other districts were unsuccessful, but the fact is that there was, in earlier years, less poor farming by individuals in the Greeley district than elsewhere in the state, principally because of the organized way in which Union Colony farmers started in their conquest of the then barren region. As early as 1874, The Greeley Tribune was discussing the need for scientific study of the potato crop. There was no Agricultural College nor Experiment Station at that time, though a college was talked of.

WANTED A POTATO COLLEGE.—Under date of April 1, 1874, The Tribune said:

"It would be profitable to have a college devoted to teaching the best method for growing potatoes, having potato professors and potato students; for no living man nor

*The Iowa farmer, Mr. Bliss, was the father of E. R. Bliss, member of the State Board of Agriculture.

set of men can give directions how, with any kind of certainty, to grow even half a crop of potatoes on a given piece of land." The editorial goes on to point out the various difficulties encountered including "potato bugs and blight and diverse, perverse conditions," cutting the crop down so that "there are acres on acres remaining even to this day undug." Then continuing, "there is no other crop which the farmer grows, but something can be known about it; and good farming and common sense and attention to business, are rewarded. Here is the case of our Rhode Island friends, the Smith's, whereof Madison is the leader. The year before last they had five acres in potatoes on the best ground in the world, plowed beautifully * * * and we think they had only enough for family use. Last year they had the rashness to plant six acres over the river, on a piece of the Great American, and they succeeded so as to blunder into a crop of 800 bushels. Then there is that other family known as the Clark's, which has a small continent in potatoes and they dug the matter of 200 bushels. * * * Therefore, we do need a potato college, which shall teach us how to raise potatoes."

EARLY COMMERCIAL GROWERS.—Among the early commercial growers in the district were Henry De Votie, who frequently realized \$5,000 to \$7,000 from a quarter section of land on which potatoes were the principal crop. De Votie became a banker after farming for some years. David Boyd, historian of the colony and a member of the State Legislature, was a potato grower. Benjamin H. Eaton, former governor, made money from potatoes, as did Charles F. Mason, S. A. Bradfield, B. C. Reinks, N. D. Bartholomew, A. D. Clark and J. Max Clark. The last named did much through his pen to popularize potato growing and spread information on growing and marketing methods. He was one of the first "to discover the mine of wealth that lay beneath our feet in the cultivation of potatoes," according to a statement made on the souvenir program issued for Greeley's first potato bake.

BUSINESS MEN GREW SPUDS.—At one time a majority of the business men of Greeley were potato growers. Later the potato-growing center shifted a few miles northward to Eaton, which is now considered the best adapted locality in the Greeley district. But in 1895, at the time of the first potato bake, the town of Greeley was the center of potato growing. Conditions then are reflected in the statement issued by the Potato Day Committee, from which the following is quoted:

Potatoes yield from 100 to 300 bushels to the acre for the usual range, or from 50 to 150 sacks. 100 sacks or 200 bushels to the acre is a good yield, and many good farmers average that. 150 sacks, or 300 bushels to the acre for limited areas is not uncommon * * * Alfalfa yields from 3 to 6 tons per acre per season; probably averages 4 and is usually cut three times. Alfalfa is the great renovator of the soil in this vicinity. * * * While all the above named crops, with the exception of corn, are grown in enormous quantities by our people, yet, as is well known, potatoes are our specialty. Our shipments for the past five years have probably averaged 5,000 cars a year. The shipments of last season aggregated 6,000 cars. It is generally believed that the crop of this year will not exceed 4,000 cars, or one million sacks, or in the neighborhood of two million bushels.* When the potato crop of the western and middle states is short, Greeley realizes a rich harvest; when the crop is generally a large one, our profits are

*At that time (1895), the minimum carload rate on potatoes applied on a minimum of 24,000 pounds. Now (1926), the summer load calls for a minimum weight of 30,000 pounds, while the winter load calls for 36,000 pounds. (Western Trunk Line Classification.)

correspondingly less. The average price for the last ten years is about 70 cents per hundred, or 45 cents per bushel. We have repeatedly realized from \$1 to \$1.50 per hundred, or from 60 to 90 cents per bushel. There being an abundant crop throughout the country this year, the price is unusually low; but we do not despair.

BULLETIN GIVES THE FIGURES.—Bulletin 175 of Colorado Agricultural College, "The Potato Industry of Colorado," pictures the industry from the time when the first high point was reached at Greeley, to 1910. The following is quoted therefrom:

In 1895, Colorado put in 37,000 acres of potatoes and produced three and one-half million bushels and ranked as the twentieth state in the Union in total potato production. Next year she was twenty-second. In 1900 she was twenty-third. In 1902, Colorado rose suddenly to sixteenth place in the Union. In 1903, she was tenth, and since that time she has held about that position. In 1906, her crop fell to the sixteenth, and in 1909 it rose to the ninth state. This year the August freeze at Greeley has lowered her position again to the twelfth place. The acreage in 1910 was 64,000.

In money value per year, her crop in fifteen years has grown from a little over a million dollars to an average, since 1903, of more than four million dollars, with the highest total in 1909 of \$5,928,000. The production in bushels has risen from three and one-half millions to an average of between seven and eight, with the high point in 1909 of 10,400,000.

HOW PRODUCTION DECLINED.—How production had reached the vanishing point in some districts that, in earlier days were flush, is indicated by an estimate for 1894 when the total output for the state was estimated at 20,000 cars, an increase of 25 per cent over any previous season, Greeley to ship 7,000 cars, Longmont 3,000, the Divide 5,000, San Luis Valley 3,000, and all other sections 2,000 cars. While this may have been an over-estimate (there were no accurate crop statistics gathered at that time), the proportions are indicative of the relative importance of potato districts for that period. Since then the Divide and Longmont do not figure in commercial production to any extent, while Carbondale, Eagle, Montrose and the Colorado River districts of Grand Junction and Fruita are important.

SEASONAL PRICE FLUCTUATIONS.—It is noteworthy also that seasonal price fluctuations were common then as now, due to the varying acreage of this staple all over the United States. In 1893, with a prospect of 3,700 cars to ship from Greeley, prices from November, 1892, to January, 1893, were 90 cents to \$1 per hundredweight; in March quotations had gone to \$1.20 and \$1.25, and Greeley still had 700 cars on hand. During the previous crop season prices ranged 30 to 40 cents per hundredweight. It was a case, in 1893-4, of a short crop nationally and a full crop in Colorado; a bit of luck that often comes to the irrigated regions of the West.

GROWERS WERE PUZZLED.—While the decline in productive capacity of the soil for potatoes in the vicinity of Denver may have been due mainly to neglect of the ordinary methods of crop rotation and ignorance of the value of alfalfa as a fertilizing crop, in some other sections which were

notably ideal for potatoes, other causes developed that, for a long time, were puzzling to growers. The problem was made the subject of careful study by Prof. C. L. Fitch, a potato specialist, who was on the staff of the State Experiment Station at Fort Collins for some years. In 1915 Bulletin 216 by Fitch was published by the State Experiment Station. It was entitled: "Studies of Health in Potatoes." The deterioration of the crop in various districts was discussed, and causes for it given, together with suggestions that were calculated to do much toward maintaining yields in soil types suited to potatoes.

Fitch mentioned the district south of Denver along the Platte, where the residence of "Potato" Clark was pointed out to him, and he was told by the old-time gardeners of the fine yields once secured. It was agreed among the gardeners thereabouts that the potato crop was a practical failure after 1876, the soil having been productive fifteen or sixteen years, and then, seemingly, having undergone a change which, while not affecting other crops, nevertheless made it unprofitable to grow potatoes.

Professor Fitch found that the same was true, in a measure, of other old potato-growing districts, along the Platte and all of its tributaries, where the virgin soil once had been highly favorable to this staple food crop, but where potatoes did not thrive now, though sugar beet and grain yields were very high on the same lands. At Greeley he found the season of 1915 fairly good again, but from 1911 to 1914 inclusive the crop had been far below the usual good average of the district. Fitch's conclusions were that soil heat, poor aeration and excessive watering and infection, due to these adverse conditions of growth, were among the responsible factors. From that time forward growers got a new and more definite conception of what constituted ideal potato-growing conditions, and at present the growing districts are well defined and the errors of the past may be avoided and even some of the areas once so prolific may be again used for commercial potato growing.

WILLIAM STUART'S BOOK.—William Stuart in his book, "The Potato,"* describes the western system of rotation as follows:

POTATOES AFTER ALFALFA.—In the Western potato producing centers, such as the Greeley and Carbondale districts of Colorado, a fairly defined crop rotation system is followed. For example, in the Greeley section, potatoes are usually planted on an alfalfa sod land. When potato production was at its zenith in this locality, potatoes frequently followed potatoes for two or three years in succession. At present, sugar beets may alternate with potatoes, after which one or two grain crops follow before seeding it back to alfalfa, in which crop it may remain for three to four years. * * *

At the Greeley Experiment Station, operated conjointly by the United States Department of Agriculture, the Weld County Commissioners and the Colorado State Experiment Station, a definite four-year crop rotation has been established, in which

*"The Potato—Its Culture, Uses, History and Classification," by William Stuart, Horticulturist, United States Department of Agriculture; J. B. Lippincott Company, Philadelphia, 1923.

potatoes are grown on alfalfa sod, followed the next season by oats seeded with alfalfa, the oats serving as a nurse crop, and indirectly returning a fair yield of grain; alfalfa is grown the following two seasons.

OBSERVED THE SWEET RANCH.—Stuart and other botanists who have specialized in potatoes, have for years observed the methods followed on the Sweet Ranch at Carbondale, Colorado, where ideal conditions for potato production exist and where these natural advantages are improved upon by scientific cultural methods.

“The Crystal River Land Company, generally referred to as the Sweet Ranch, has long enjoyed an enviable reputation in the production of large per acre yields,” says Stuart (p. 145: *The Potato*). Many of the illustrations in the book are from photographs of fields, storage cellars and tubers taken on the Sweet Ranch, these including portraits of Lou D. Sweet and Frank E. Sweet, who for years were joint owners of the ranch at Carbondale, where potato history has been made. One of the illustrations shows a 65-acre field of Russet Burbanks (Netted Gem) potatoes which yielded at the rate of 500 bushels per acre. Lou D. Sweet was at one time president of the Potato Association of America and he has also served as head of the Colorado Potato Growers' Association. The Sweet Ranch specializes in the production of seed potatoes as well as fine quality of market potatoes, which are shipped to Denver hotels and exclusive clubs. The Burbank potato has been brought to such perfection on the Sweet Ranch that Luther Burbank, who developed this variety, in the latter years of his life acknowledged his debt of gratitude to the Sweet Ranch for preserving the strain in its purity and trueness to type.

Carbondale was the home also of Eugene Grubb, former member of the State Board of Agriculture, who was at one time widely known as a grower of potatoes for special trade, supplying railroad diner service.

POTATO EXPERIMENT STATION.—The mention in Stuart's book of the United States Potato Experiment Farm at Greeley recalls the fact that, in the early years of the Union Colony, Editor Meeker advocated establishment of a “potato college,” because of the uncertainties encountered by the pioneers in production. The Potato Experiment Station has proved more than a college in its usefulness to those growers who have taken advantage of the lessons taught there from season to season.

ESTABLISHED IN 1915.—The Colorado Potato Experiment Station* was established at Greeley, Colorado, in 1915, under an act of the 20th General Assembly and has been maintained under a co-operative agreement between the Board of County Commissioners of Weld County, the Experiment Sta-

*From notes supplied by W. C. Edmundson.

tion of the State Agricultural College and the Bureau of Plant Industry of the U. S. Department of Agriculture.

A 40-acre tract of land was leased at that time for a ten-year period for the Potato Experiment Station, and investigational work was conducted on this leased farm from 1915 until 1924. In 1924 the General Assembly authorized the co-operative purchase of land with the county commissioners of Weld County for the continuation of the Potato Experiment Station. An 80-acre tract of land located four miles northeast of Greeley was selected and purchased. This land, purchased jointly by the State of Colorado and Weld County, is leased to the Bureau of Plant Industry of the U. S. Department of Agriculture and operated by the offices of Cotton, Truck and Forage Crop Diseases and the office of Horticultural Investigations.

Dr. C. F. Clark was superintendent of the station from 1915 until 1918, when he was superseded by W. C. Edmundson, associate horticulturist, who has been superintendent since that time.

The potato cultural investigations have been carried on by Dr. Clark and Mr. Edmundson, of the Office of Horticultural Investigations, while the potato disease work has been carried on since 1915 by Dr. H. C. MacMillan.

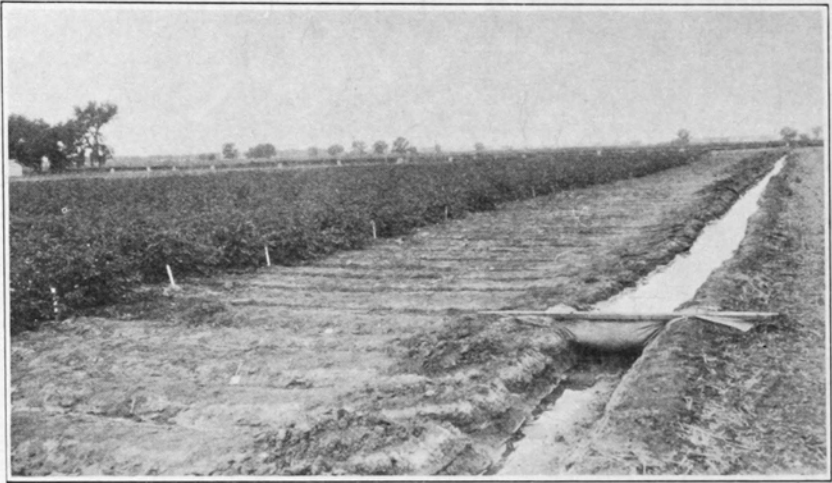
The potato cultural investigations have been conducted along the following lines:

Irrigation studies	Time of planting
Whole vs. cut seed	Distance of planting
Greened vs. ungreened seed	Varietal tests
Immature vs. mature seed	Strain tests
Effect of soil, set and vitality of seed	Testing of seedlings
Effect of irrigation on seed	

The seedlings or new varieties used in the Colorado tests have been originated at the experiment station at Presque Isle, Maine, a station maintained by the Office of Horticultural Investigations under Dr. William Stuart. A report of the cultural work by the stations was published in January, 1921, by Dr. C. F. Clark as Bulletin No. 261, of the Agricultural Experiment Station of Colorado. Whole vs. cut seed results were published September, 1924, in Department Bulletin No. 1248 of the U. S. Department of Agriculture.

IRRIGATION STUDIES.—The results of irrigation studies were published by Mr. W. C. Edmundson in a July, 1925, issue of *Through the Leaves*, a publication of the Great Western Sugar Company; also in the proceedings of the twelfth annual meeting of the Potato Association of America. The irrigation studies will also be published in a U. S. Department Bulletin. The results from mature and immature studies and the greened vs.

ungreened seed are now being printed and will be issued as a U. S. Department Bulletin.



*Irrigating potatoes on the Colorado Potato Experiment Station near Greeley.
(Photo by W. C. Edmundson.)*

The outstanding cultural work of the Colorado Potato Experiment Station is probably the result of the irrigation studies. It has been the general practice of the irrigation farmers to withhold the first application of water until the plants begin to turn dark in color, or the vines show a wilting from lack of moisture. The irrigation studies over a period of twelve years have clearly demonstrated that this practice should not be followed. Plots that have received early irrigation, producing a vigorous vine growth throughout the season, have given much larger yields of good quality tubers than when the common practice of irrigation has been followed.

INVESTIGATIONS AT THE POTATO DISEASE LABORATORY*

The establishment of the Greeley Potato Station in 1915 was primarily due to the famous potato failure of 1911. In the study of Colorado potato diseases it is to be regretted that there remains no adequate scientific record of the happenings of that disastrous year. Beginning with 1915, and for several years thereafter, the potato crop was fairly free from damaging diseases, no epiphytotic of any significance occurred, and the troubles of former years did not appear in devastating form. However, from the eleven years of study the more or less completed picture of Colorado potato pathology can be drawn.

*From statement of Dr. H. G. MacMillan, Pathologist.

The results of these studies are being prepared for publication under different titles. The most important diseases are those caused by *Fusarium* species, *Rhizoctonia* and virus. One of the important phases of potato disease was pointed out in the *Journal of Agricultural Research*, Vol. 16, 1919, under the title "Fusarium-blight of Potatoes Under Irrigation."

There have been numerous contributions to scientific journals and papers from this laboratory, all dealing with various plant diseases, especially potatoes. Among other studies is a short paper entitled "Sunscald of Beans," which appeared in the *Journal of Agricultural Research*, Vol. 13, 1918. This study is being taken as the starting point for some additional research at this laboratory.

PRIZE ACRE STARTS SAN LUIS VALLEY

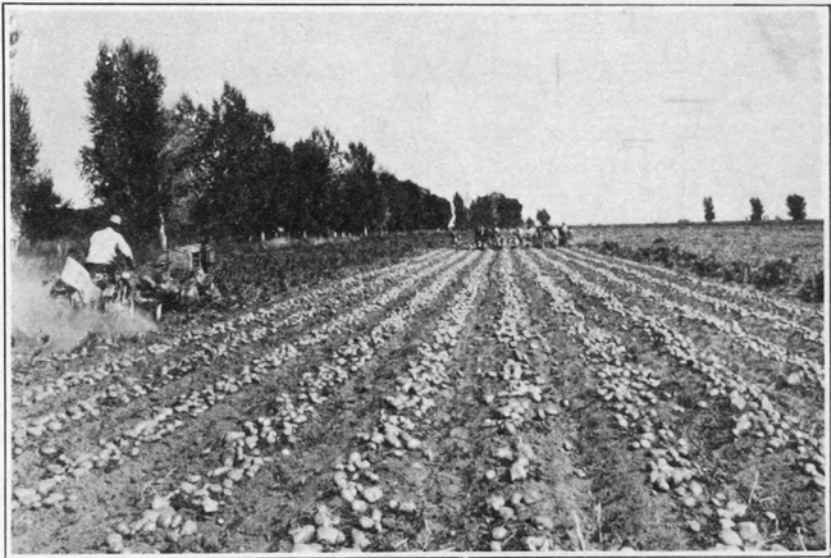
SPUDS FOR THE PROSPECTORS.—During the rush to the San Juan in the seventies, farmers along the streams followed by the prospectors over Cochetopa Pass and up the Rio Grande, supplied whatever food they could produce. The first record of potato growing in the San Luis Valley dates back to those years. In fact, there, as elsewhere, the first settlers on farms grew potatoes. In 1875 De Witt C. Travis on San Isabel Creek in Saguache County, grew 70,000 pounds of potatoes, among others being the Travis Rocky Mountain Seedling, a variety which he propagated. He claimed for this a yield of 500 bushels to the acre.

Next came the Leadville boom and a demand from that region for potatoes and other food and feed. Farmers in the Del Norte and Saguache communities growing a few acres each, hauled potatoes to the mining camps of the Leadville district in the eighties and were well paid for their product.

STATE'S HIGHEST YIELD.—The first shipper of potatoes in quantities was R. C. Nesbit of Del Norte, who, about 1882, started growing potatoes commercially. Among others who got in the business about the same time was Peter Barkley, who came from Cape Breton Island, Canada. He introduced a potato which his neighbors called Barkley's Prolific. This was the progenitor of the now famous Brown Beauty, the leading variety grown in the San Luis Valley. Barkley brought six of these tubers to Del Norte after a visit to his boyhood home in Canada in 1886, which he gave to R. A. Chisholm. It was from this stock that Chisholm grew a prize acre in 1889. This measured acre yielded 847½ bushels, a record never equaled in Colorado. It was the wide publicity given this high yield in a national contest, promoted by the *American Agriculturist*, that attracted attention to the potato-growing possibilities of the San Luis Valley. Chisholm won a thousand-dollar prize on this yield.

BROWN BEAUTY IS NAMED.—It was not until 1906 that the Barkley's Prolific was re-named Brown Beauty. It was then being grown by Edward Newton of Monte Vista, a market gardener, under dry land conditions, on Raton Creek. Because of its smoothness and the brown color of the skin, Newton called his potatoes Brown Beauties, and that name was adopted generally by the growers for what had been the Barkley Prolific.

Several years ago an attempt was made by W. H. Olin, supervisor of agriculture of the Denver & Rio Grande Western, to trace the history of Barkley's Prolific. He sent a sample to Professor William Stuart, potato specialist for the Department of Agriculture at Washington, who could not



Harvesting Brown Beauty Potatoes in the San Luis Valley.

identify it with any established type. Stuart in turn sent samples, grown on the department farm, to the Ontario Agricultural College at Guelph and also to the Dominion Experimental Farm at Ottawa. The potato was a stranger to the Canadian experts.

At a meeting of the Potato Association of America at Toronto in 1921, Olin made a further attempt to have the Barkley Prolific identified by experts from all over the United States and Canada, also without result. As a last resort, samples were sent to the Royal Horticultural Society at London, England, to be grown there under observation of Dr. Macoun and the report was as follows. "We grew the potatoes you sent and failed to

identify them with any with which we are familiar. They have foliage of the type we in England know as American, and I have little doubt they belong to an American seedling."

Having thus tried to trace the ancestry of Barkley's Prolific from which the Brown Beauty was produced, the decision was to consider the latter a San Luis Valley product, always to be known as the Brown Beauty, which is grown nowhere else and which makes up the bulk of the crop in the valley.

BROWN BEAUTY WINS TROPHY.—Fred Diller of Monte Vista won sweepstakes at the Colorado State Pure Seed Show, Colorado Springs, November, 1922, with Brown Beauty potatoes. His father, O. F. Diller, got permanent possession of the D. & R. G. W. Spud Trophy with the same variety at the San Luis Valley Potato Show at Center in 1922, having taken the cup two out of three times in a contest in which all standard varieties were entered.

The Farmers Insurance Company at Hartford, Connecticut, who were owners of the Del Norte irrigation canal, bought all of the seed from R. A. Chisholm's thousand-dollar prize acre for their farm near Monte Vista. Seed from their first crop was widely disseminated over the valley. While the original stock of this highly prolific and ideal market type was brought into the valley by Barkley, it was Chisholm's success in the prize contest and the subsequent spread of the information about that big yield, which started the valley on the way to success as the largest potato-producing district in the state.

In 1925, 7,282 carloads of potatoes were shipped out of the San Luis Valley. Shipments in recent years have been running 5,000 to 6,000 cars.

THE DIVIDE DISTRICT.—The only considerable district producing potatoes commercially without irrigation is known as the Divide district, embracing portions of Douglas, El Paso and Elbert counties, where the rainfall is approximately 20 inches per annum and the elevation such that cool growing weather prevails. Here conditions are ideal for seed production, and that business has reached considerable proportions. Here, too, there was a period of decline, during which very few potatoes were produced: In fact, the acreage in late years has not been as large as it was thirty years ago. These changes, however, have been more than compensated for by new potato-growing territory in the state. In late years better methods of culture and an understanding of the conditions necessary for commercial production, together with more attention to good seed, have tended to hold acreage and production steady.

Acreage and value have risen steadily, though the fluctuations continue from year to year, with the price and production curve of the crop nation-

ally. The average annual yield for the five-year period 1917 to 1921 was 11,225,000 bushels. Taking a per capita requirement of 7.3 bushels, Colorado produced enough potatoes to feed three million people, or more than three times her own population. During this period it was necessary to ship out of the state more than two-thirds of the crop.*

The state's principal potato-producing sections are known by district names including the Greeley district, the San Luis Valley, the Arkansas Divide, Eagle-Garfield district, the Uncompahgre Valley and the Mesa County district, centering at Fruita and Loma, noted for early potatoes.

HAS ADDED MUCH WEALTH.—The potato has added tremendously to the state's agricultural wealth from year to year, and as Colorado's reputation for quality has long been established, its markets are well developed and there is every reason for believing that potatoes will continue for years to come to be an important surplus crop. Co-operative marketing has reached a higher stage of development with this crop than with any other in Colorado, as is related in another chapter of this volume.

HOW CORN GROWING STARTED

CORN IS INDIGENOUS.—While corn of modern type is an introduced crop in Colorado, the plant is indigenous to the region, its origin going back into antiquity so remote that the subject becomes a question for archæology rather than agriculture. The ancient Cliff Dwellers grew corn in southwest Colorado, as their habitations amply show, when searched for evidences of an earlier agriculture. Ears of corn, grains separated from the cob, the cobs, husks, objects woven from the husks, all in a good state of preservation, tell the story of corn on the Mesa Verde in Montezuma County.

In the Chimney Rock country where excavations have been made of pre-historic ruins, corn has been found that probably dates back to the time of the post-basketmakers two or three thousand years ago.

FOUND IN THE RUINS.—These evidences are found also in the ruins of ancient pueblos that are being uncovered in adjoining states in the arid regions of the Southwest. The corn of the Pueblo Indians has survived and it is grown today in Arizona by tribes that are direct descendants of the ancient southwestern farmers. That corn, however, is not commercially important, though of absorbing interest historically.

How little we really know of corn growing in ancient America is emphasized by such fragmentary indications as this from the Rocky Mountain News of August 14, 1861:

*Bulletin, "Colorado's Agriculture," by R. McCann and T. H. Summers, Extension Service Colorado Agricultural College, 1924.

“Mr. C. S. Wright has placed in our hands a portion of an ear of Indian corn, thoroughly petrified. The grains of corn and the formation of the cob are as plain as in the natural ear. It was found in the valley of South Boulder Creek near the foot of the mountains.”

If that geological find was in reality a petrified ear of corn, speculation as to its origin might go back for ages instead of centuries.

MEXICAN CORN.—In our own age, however, there were strains larger and better than the corn of the Pueblos and Cliff Dwellers grown in the earliest years of Mexican penetration up the Rio Grande and in the Arkansas Basin. These are the strains that include corn of variegated colors—the blue and the red kernels, flinty and hard, as well as the white, bred to withstand aridity and thrive under primitive methods of cultivation and irrigation. These better strains of Mexican corn are not important commercially, though grown in many localities like the lower San Luis Valley, where the frost free period is short, adding to the natural inhibitions that must be overcome by man at farming under semi-arid conditions in high altitudes.

There is also to consider the fact apparent from the early records of settlement and exploration that the plains Indians did some farming and that corn was one of their crops. This was true along the west bank of the Missouri River in the territories of Kansas and Nebraska, though there is no authentic record that the tribes that roamed over the plains at the time of the Pike's Peak rush grew corn in what is now Colorado.

The corn which was grown by the tribes in the Missouri Valley was of eastern origin, coming with the Indians who had been driven westward by the white man. Whether this was the same in character and quality as the corn which the Pilgrim fathers found in the Indian settlements on the shores of the new world is undetermined. The corn brought to Colorado across the plains by the emigrants, beginning with 1858, was of improved strains such as were grown in the central states at the time.

Farming in Colorado started in 1858 with two distinct kinds of corn, the Mexican in the southern region and the American varieties in the Pike's Peak country. In fact, corn had been grown in southern Colorado since the early forties at the trading posts and since 1852 in the Mexican settlements of the San Luis Valley. Corn was one of the staple products brought by wagon train, mostly for seed, because its bulk prevented carrying it in large quantities.

PIONEERS BROUGHT SEED.—Corn was planted the first year of farming along the Platte and in Clear Creek and Cherry Creek bottoms. Wheat and potatoes have been brought in the same way and probably for the same primary purpose—seed. While these first plantings under irrigation gave

good results, the settlers were aware that corn had been grown by the Indians of the West and they learned, too, in time, of the Mexican corn in the south. Undoubtedly it was Mexican corn that Parkman* saw in "the Pueblo" at the mouth of the Fontaine in 1847; and that was the kind John Hatcher planted in his unlucky venture in farming on the Purgatoire in 1846.†

Corn was much in demand along the Santa Fe Trail as feed for oxen and mules, and the Mexican War, which witnessed the movement of troops up the Arkansas, gave the pioneer trader and ranchman a chance to try his hand in growing forage and grain. It was that movement following the decline of the Santa Fe trade, but the beginning of a new era of American settlement, that stimulated corn growing in southern Colorado, so that when the rush to the Pike's Peak region set in the few isolated settlers were prepared to supply the demand for this, the most popular of all American grain and forage crops.

In the fall of 1859 when the first crops had been harvested in the Platte Valley, tall stalks of corn were among the exhibits brought to Denver by those who had grown garden crops or developed small farms under the new conditions. In the following year reports came to the newspaper at Denver, from numerous sources, that corn promised as good a yield as back in the States. The farmers on the Huerfano also sent up exhibits that fall to show what was being done in corn raising in southern Colorado. From Kroenig's came an ear of corn to Dunn's store at Denver measuring 15 inches long. This ear was left at the Rocky Mountain News office, and the comment under date of October 11, 1860, was: "It is still on exhibition and is good proof of the fertility of the soil of the upper Arkansas region."

SIX HUNDRED ACRES IN ONE FIELD.—In 1861 the Huerfano ranches were producing corn extensively. In that year J. B. Doyle had what was probably the largest field of corn grown in the Rocky Mountain region up to that time. Its extent was 600 acres and the comment was that it looked "as luxurious as you could see in Iowa or Illinois."‡

That was in July. In November the Rocky Mountain News announced that J. B. Doyle was in Denver and that he had finished harvesting his immense crop of corn. A day or two later came a wagon train of corn, 28 loads of it, from Doyle's ranch to Denver to supply the demand for feed. What it sold for is not recorded, but undoubtedly Doyle was well repaid

*"The Oregon Trail," by Francis Parkman. "When we reached it, we found that Richard had sent a Mexican to bring us an abundant supply of green corn and vegetables and invite us to help ourselves to whatever we wished from the fields around the Pueblo."

†Chapter on Irrigation, this volume.

‡Rocky Mountain News, July 22, 1861.

for his enterprise, as there was no feed on the market at the time other than hay.

In May, 1861, W. M. Pierson brought word to Denver from the Huerfano settlements that a large acreage of corn had been planted and he estimated that 60,000 bushels would be harvested in the fall. Corn meal from the Huerfano had helped feed the emigrants at Denver and in the mining camps in 1860. Twenty tons of cornmeal came in one wagon-train load from Kroenig's grist mill on the Huerfano to Dunn's store.

SWAPPED CROP EXPERIENCES.—Farmers were beginning to exchange crop experiences, and those who could put their thoughts on paper found the press open to them for discussion of agricultural problems. There was a communication in *The Denver Weekly Commonwealth* of October 9, 1862, from A. H. Miles, in which he related his experiences with corn, stating that his crop in 1861 had averaged 40 bushels to the acre. "In 1861 I broke seven acres of heavy sod ground, planted it with York State corn and raised 40 bushels to the acre," he wrote. "Last spring (1862) about the middle of March, I harrowed down the corn stubble and sowed three acres of wheat and four acres of barley. The barley was a splendid crop; some of it stood five feet high and was a very heavy crop. My wheat was extra, both in quality and quantity. Some of my neighbors judged it would yield 45 and others 35 bushels to the acre. My own opinion is it will yield 40 bushels per acre at least. There were two varieties in the crop—the Canada Club and the Siberia." Miles' place was known as Greendale Farm.

It was on the Miles farm in 1868 where a record of 316 bushels of corn on one acre was claimed. This obviously mistaken record was backed by an affidavit published in the newspapers, five of Miles' neighbors having testified that they assisted in measuring the corn from one acre out of the forty-acre field on the Miles farm. That something was wrong with their calculations is doubly certain from the fact that they stressed the point that the field had received no irrigation. It was on Cherry Creek, about two miles from the heart of Denver—ground which is now within the city limits. The fact is worth recording that Miles got a high yield, though what that yield actually was is not known.

Heavy yields of corn under irrigation surprised the pioneer farmers, who were not accustomed to watering their crops, nor had they any knowledge of how often water should be applied. The fact that their ditches depended on direct flow probably prevented much over-irrigation. They would have used more water had their ditch systems been successfully carried to all parts of their fields, or had the water been available as wanted.

FIRST BREEDING EXPERIMENT.—The first effort at corn improvement under the new conditions was made by W. D. Arnett of Bear Creek, a progressive farmer who was much in the limelight. Arnett attempted to develop a new strain by crossing the native Mexican flint corn with King Philip, a yellow dent variety brought in from the States. The cross was described in 1864 as retaining many of the original characters of the yellow dent, though the period of two, or at most three, seasons was too short for definite results. Nothing further was heard from Arnett's corn. King Philip was mentioned occasionally, as that was a popular variety at the time in Illinois, Indiana and Ohio.

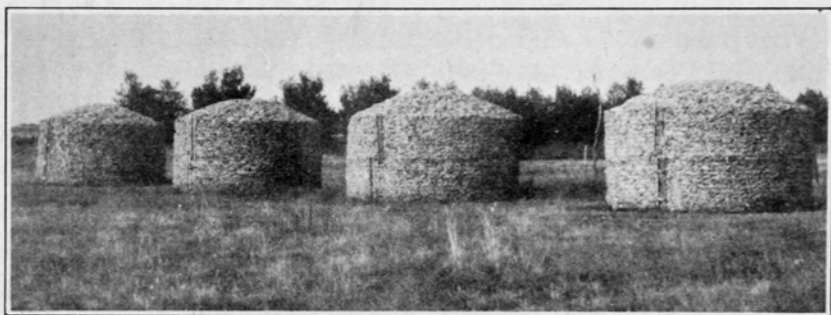
Emigrant trains and mining development provided a steadily increasing demand for corn and there was also a constant call for the crop as human food. Army posts were in the market for feed of all kinds to sustain cavalry horses and the oxen and mules used as motive power for supply trains. It is surprising, therefore, to read in 1867 of an overproduction of corn in the Fontaine Valley.

PRODUCING TOO MUCH CORN.—P. D. Miller, a ranchman and merchant from the Fontaine, was in Denver in May of that year. He brought to the office of *The Rocky Mountain News* "several sample ears of yellow dent corn from the farm of Mr. Putney," and, adds *The News*: "It is estimated that there are still over the Divide in the hands of the farmers 50,000 bushels of corn of last year's crop. Corn is worth only three cents per pound by the sack. Those able are holding rather than sell at that price."

HOGS DRIVEN ACROSS PLAINS.—This was during a period of stagnation in the mines when that market, for the time being, was closed to corn growers. The livestock on farms consisted principally of milk cows. Beef cattle roamed the unbroken prairie and lived on grass, and of hogs there were few. Small droves of hogs had come with some of the emigrant trains, and in 1861 there arrived in Denver from the Missouri River a drove of 252, probably the largest drove ever brought that distance. In the southern settlements there were hogs which had come up with the colonists from New Mexico. The corn crop, however, had little relation in those days to the supply of pork.

The drove that came across the plains in the summer of 1861 was herded on the prairie on the outskirts of Denver, as will be noted from the statement in *The Rocky Mountain News* of July 31, 1861: "A train of two or three hundred hogs take up their line of march each morning from their camp near Park's house for the best suburban pasture and return every evening in the plenitude of their pig perfection, under the guidance of

efficiently experienced hog drivers and with a seeming appreciation of their importance and dignity, dependent on the scarcity of the swine species in this uncivilized country."



Stored from the 1923 corn crop on the dry land farm of A. A. Blach, near Yuma.

Which is rather bombastic language in speaking of the lowly porker, but justified by the fact that pork was a luxury in the Pike's Peak country.

CORN IN THE SEVENTIES.—Corn received a trial in all districts where farming got a start under irrigation. In a few years, however, early efforts to acclimatize seed from the eastern states came to a standstill and for a long period the crop remained comparatively unimportant. It was frequently mentioned at Farmers' Club meetings in the Union Colony, at Boulder and in the Chicago Colony at Longmont. Meeker urged the Union Colonists to grow corn, declaring that the soil was well suited to the crop, that it was easily kept free of weeds and "when we come to raise all the corn we consume, and at the same time all the pork, becon and lard we need, a large amount of money will be retained that now goes abroad."*

Boulder County boasted of corn in 1873 "which stands ten feet high and is as fine looking as the average of that raised in the corn-growing states." That is from the Longmont Interocean of October 1, 1873. The editor stated that in a trip over the St. Vrain Valley the previous week he had seen corn that would probably average thirty-five bushels to the acre. The Chicago Colony had started farming in 1871 and the colonists, being mainly from Illinois, naturally felt they could not farm without corn.

While there was considerable boasting about tall stalks and big ears, there was recognition among careful farmers of climatic limitations that made tall corn undesirable. "The variety mostly cultivated," said the Evans Journal of October 8, 1873, "is the same small-eared yellow corn which ripens generally before frost; but the Mexican and Australian is also cultivated, and is preferred by some of our farmers."

*Greeley Tribune, July 29, 1874.

HISTORY OF SWADLEY CORN

BEARS A COLORADO NAME.—Swadley is perhaps the first and only variety of corn bearing a Colorado name and developed by a Colorado grower. The pedigree of Swadley goes back to the Alleghany Mountains in Pennsylvania, from which region George C. Swadley, a Clear Creek Valley farmer, brought the seed in 1875. Swadley brought several varieties of yellow dent corn from a mountain region sixty-five miles from a railroad. He tested these varieties on his Jefferson County farm, and after several years' trial centered his efforts on a twelve-rowed dent which ripened earlier than the others and apparently was well suited to Colorado conditions at 5,000 feet above sea level.

Swadley had come from the Shenandoah Valley in Virginia. He was at one time a member of the Board of County Commissioners of Jefferson County, and his wide acquaintance with farmers aided in popularizing Swadley corn. Henry Lee, a Denver pioneer seedsman, handled the seed and advertised it widely, so that during the middle eighties and later Swadley corn was grown from Douglas County north to Wyoming, in the irrigated sections. It was grown also on the dry lands and proved quite adaptable to light moisture. It is still listed in the seed catalogues and finds a ready sale in this and neighboring states.

Swadley's farm was at Arvada. He was known as a good farmer, whose work in corn improvement was not undertaken with any thought of profit to himself. He made no effort to capitalize Swadley corn nor to establish it securely by having it classified at the fairs. In fact, it is not known that he showed this corn at any fair. The varietal name became fixed through use in seed catalogues, and the demand for Swadley corn grew from knowledge of its quality, first passed from farm to farm by word of mouth.

PRIDE OF THE NORTH APPEARS.—In a paper read before the Jefferson County Farmers' Institute in April, 1888,* J. S. Stanger mentioned several varieties of corn popular among Colorado farmers at that period. He said:

"I have said nothing about the kind of corn to plant. I am satisfied that any corn that matures in northern Iowa or Illinois will do well here. Hackberry, Calico, King Philip and any of the early dents. I have tried several varieties and my preference is the seed I here present for your inspection. It is a beautiful yellow dent, Pride of the North, brought to Colorado from Dakota three years ago. The cob is small, the grain long and not so hard as the Grafton or Swadley corn. Both the latter varieties are good, and deserve the name of Colorado corn, from the fact that they have been raised in our state for 15 years or more." The speaker went on to say that he got an average of 35 bushels per acre from Pride of the North. He considered the fodder worth as much or more than one good cutting of first-class alfalfa or red clover, worth on the farm anywhere in Colorado, \$5 a ton. Corn is worth in the state, 55 cents a bushel. A crop of 30 bushels brings \$16.50, leaving a fair margin for interest, taxes, etc." He

*The Colorado Farmer, April 26, 1888. Stanger was one of the founders of that paper and had been its editor some years before.

continued: "It is worse than folly and falsity to say we cannot raise corn in Colorado at a profit, for the price it is worth here, either to sell or to feed." He quoted government statistics for 1885, showing average corn production and price throughout the United States. Average yield in middle-western states, 32.7 bushels; in extreme western states, 23.5 bushels, Colorado being the highest of these with 34. The highest price quoted was Idaho, 82 cents; 80 cents in Montana; average of New England states, 70 cents; western states, Nebraska lowest, 19 cents; Colorado, 68 cents.

Of the Grafton variety mentioned by Stanger there seems to be no record. At any rate, it never became as popular as the Swadley corn.

FIRST TESTS AT COLLEGE.—The first report on corn tests made at the Agricultural College was published in December, 1887, in Bulletin No. 2, entitled "Grains, Grasses and Vegetables." This bulletin made mention of the fact that thirty-five varieties had been grown on the College farm and of these there were two that showed desirable early maturing qualities, suitable to Colorado climatic conditions. These were Pride of the North and Yellow Flint. Of the former it was stated that when the tests were started it took 141 days to mature and that in 1887 time had been cut down by careful selection to 98 days. Pride of the North for many years was one of the safest varieties for the irrigated sections of northern Colorado. These tests began about 1880, so it is evident that Pride of the North had been grown in Colorado for more than three years, as indicated by Mr. Stanger in his paper before the Jefferson County Farmers' Institute.

Record crops were heard of here and there. In *Field and Farm*, June 17, 1893, the statement was made that "the best crop of corn raised in Colorado, so far measured and recorded, goes to the credit of J. C. Kain of Rocky Ford, who last season grew 81 bushels and 50 pounds on an acre of ground. The corn was raised on land that had been in alfalfa, which had been plowed under for the crop. The variety was a common yellow dent."

For a long period there was serious question as to how much stress should be put on corn growing in Colorado. Many farmers who had obtained seed in the East gave up in despair after a few years' trial, as it was a common thing for their crop to be caught by the first freeze of autumn. Here and there a farmer stuck to his favorite crop, selecting some adaptable variety that did well in his locality. There were many such local varieties that persisted and made grain nearly every season at altitudes of 6,500 to 7,000 feet. On the plains the development of dry-land farming revived the corn question. The irrigation farmer had a good crop list, and he could substitute barley for corn in the ration with good results, but for the dry-land farm there seemed to be no feed grain other than corn.

A strong effort was made from about 1905 to 1915 to popularize the grain sorghums, and these finally found a place in the crop scheme in

southeastern Colorado, but over the main part of the dry-land section corn has become firmly established.

PARSONS DEVELOPS VARIETY.—Much work in this direction has been done by farmers, among whom was E. R. Parsons, who developed what was known as the Parsons High Altitude corn. The foundation used was White Australian, with crosses of several white dents, the first being similar to and probably identical with Iowa Silvermine. He also crossed with Evergreen, a sweet corn. The first cross produced a good yielding corn, with drouth and cold-resistant qualities, but further work was done to increase size of ears. Careful and vigorous selection resulted in establishing a type which, in a short season and with scant rainfall, without artificial watering, produced at least one good ear to the stalk.

“In propagating the Parsons corn,” said the breeder,* “the largest ears from the driest part of the field were used, because size without drouth resistance could not be obtained in a dry-farmed corn. Preference was always given to well-dented ears, because White Australian, being the dominant strain, there was always a tendency, although diminishing with the years, to revert to flint. No attention was paid to fine points, for this corn was originated to fill a want—for a time—to feed cows, pigs and chickens on my ranch, where it proved to be the best yielder until it was superseded by a better, and the writer knew then, and knows now, that a finer corn is coming, but it could not come in a hurry. The essence of adaptation is time. Forty years ago the dent corns of the East had got no further than central Kansas and Nebraska. They will soon be knocking at the gates of the Rocky Mountains.”

HOW MINNESOTA 13 STARTED

A COUNTY AGENT'S ACHIEVEMENT.—What Mr. Parsons had forecast came true in the adaptation of Minnesota No. 13 corn to Colorado conditions on both irrigated and non-irrigated lands. That work was started by H. H. Simpson, a county agent, through the Boys' Corn Clubs of Boulder County, aided later by adult growers, who saw the value of the work which the club boys were doing. In 1915, about a year after Simpson became county agent, he decided on a corn-improvement project, as the crop was desirable, principally for silage. Minnesota No. 13 corn had been developed by the Minnesota Experiment Station as an adaptable variety for the short season of that state. It is a yellow dent of desirable quality, and its habit of growth seemed suited to Colorado conditions at 5,000 feet altitude.

*Western Farm Life, August 1, 1917.

SEED FROM ADAMS COUNTY.—The first seed procured by Simpson for Boulder County trials was from George Turner, an Adams County farmer, who had grown it on dry land several seasons. Seed was obtained also from the Minnesota station. With these two sources of good seed the project of standardization and adaptation of the variety was started. Boys' Corn Clubs were being organized and seed of Minnesota No. 13 was given them to grow in acre lots. Complete record was kept from the start, so that the pedigree of Boulder County Minnesota No. 13 may be traced back through the seasons, the records showing yield, germination, whether grown with or without irrigation and other facts essential in seed registration.

In 1917 adult farmers became interested and seed was procured for them from Minnesota and loaned, to be returned on a bushel for bushel basis. An annual corn show was started for the purpose of exhibiting Minnesota No. 13, watching results of adaptation of the variety and comparing it with other varieties grown in the county. Many farmers stuck to the old varieties, but the fact that work was being done with Minnesota No. 13 caused them to apply the same methods of seed selection and testing, hence resulted in improvement of corn which had been grown in the county for many years.

After three or four years of these tests and the annual comparisons at the show, Minnesota No. 13 was definitely established by the Boulder County Farm Bureau as the standard corn for that locality. This applied to irrigated and non-irrigated lands.

FIRST CORN SHOW HELD.—The first corn show was held at Longmont December 12, 1918. An ear of Minnesota No. 13 was declared by the judge to be the grand champion of the show. This ear was produced by Shelby Holton of Lyons, a fourteen-year-old Corn Club boy. It was later shown at the National Western Stock Show, attracting the attention of farmers and ranchmen from all parts of the Rocky Mountain region. At the corn show in Longmont the ear was put up for auction, selling for \$7.74, or at the rate of one cent per kernel. Shelby Holton left that show with over \$26 in cash, having sold six half-bushel crates of seed at the rate of \$6 per bushel, in addition to the sale of the grand champion ear.

In this way knowledge of Minnesota No. 13 was spread. The factor that was most effective was the sale of tested seed. Germination always ran unusually high, an indication to farmers that the corn was well matured. Under the comparatively short growing season of high altitudes early maturity of a dent corn is a highly desirable quality.

While the first efforts in the adaptation of Minnesota No. 13 were due to agitation during the World War period for more silos, for storing feed that would aid in increasing the production of milk and meat, it was soon

evident that this variety also excelled for grain production. There was no difference, in fact, in the selection work for either purpose, as the ideal corn for silage is a fairly well-dented ear, and early maturity was therefore as desirable for silage corn as for corn grown for grain. However, the silo-building campaign was carried on in Boulder County simultaneously with standardization and adaptation of Minnesota No. 13. There were 39 silos in Boulder County when the work started in 1914 and about 350 in 1919, by which time the acreage of corn had increased, so that these silos could be filled. While this increase was not all of the new variety, more than one-third of the 8,000 acres of corn in Boulder in 1919 was Minnesota No. 13. About 15,000 pounds of tested, registered seed were sold that year by adult farmers and Corn Club boys. The yields averaged about 40 bushels per acre, often going as high as 60 bushels under irrigation and about 25 bushels without irrigation.

Work with Minnesota No. 13 has gone forward steadily in all corn-growing counties that have extension service, and the variety is now a favorite in Weld, Larimer, Adams, Logan and other northern Colorado counties, and has a good start also on the Western Slope, while large quantities of seed are shipped to other western states. Most of the orders received from other states by Colorado seed houses are for Minnesota No. 13.

As already indicated, this corn was developed by the Minnesota Experiment Station, the original seed having been procured by the station in 1893 from a St. Paul seed house. It was listed only as No. 13, hence that designation was given it in the tests on the Minnesota Station farm. It was northern-grown seed, but there seems to be no record of just where the original stock was produced. Improvement was started by Professor C. P. Bull, and beginning with 1897 seed was distributed among the farmers of Minnesota. It met the demands of a rather rigorous climate in the North and readily adapted itself from the start to conditions in Colorado at altitudes of a mile to a mile and a half above sea level.

It was distinguished from the older high-altitude corns by its good yielding qualities as well as size and quality of ear.

CLUB BOY MAKES A RECORD.—It was Minnesota No. 13 with which Raymond Condon, a Weld County Club boy, won the state championship in 1924 for high yield, with a record of 109.78 bushels. While this contest was conducted by the Weld County Farmers' Protective Association, it was open to club boys and adult growers all over the state. Condon had already won the county championship and had made a business of producing registered seed on his father's farm near Johnstown. He paid part of his expenses as a student at Colorado Agricultural College with money received from the sale of registered Minnesota No. 13 seed.

In 1926 a new state record was made by David Eisele, a Boulder County farmer, with a yield of 112½ bushels of Minnesota No. 13, in a contest conducted jointly by the Boulder County Farm Bureau and the Longmont Chamber of Commerce, under supervision of George R. Smith, county extension agent.

The type has become fixed in Colorado, and while the varietal name suggests another state, Minnesota No. 13 is now truly a Colorado corn. It is especially adaptable to the northern section of the state, the Arkansas Valley having a longer growing season, therefore favoring varieties that produce a larger ear. However, year by year and bushel for bushel, there is no other corn grown in Colorado answering all purposes so satisfactorily as this variety.

On the branch experiment station at Rocky Ford, where twenty-nine varieties of corn were being tested in 1919, Minnesota No. 13 was showing its quick maturing qualities. Farmers on tour of the county early in the fall that year had a chance to compare the various kinds under test, and the comment made at the time was: "It will be noted that Minnesota No. 13, here as elsewhere, has shown its quick maturing quality. This is also true of Swadley, White Australian, Dakota Ninety Day and Wisconsin No. 7, which were in tassel early in July. These corns were all ready to cut for silage the last week in August. Of course, they could not compare with some of the taller varieties in tonnage, but they have the habit of quick growth needed to escape frost damage."*

The impetus given corn improvement through the silo campaigns during the war period had its effect in standardization and led finally to the organization of all farm seed-improvement work which is now handled under the direction of the Colorado Seed Growers' Association.

PRESENT STATUS OF CROP.—In 1909 the corn acreage in the state was 326,559 acres; in 1915 it had risen to 470,000 acres. The total production in the latter year was 11,280,000 bushels. The ten-year average, as given in 1916 by the U. S. Department of Agriculture for Colorado, was 21.2 bushels per acre, which included both irrigated and non-irrigated lands.

In 1925 the acreage of corn was 1,494,000 and the yield 22,410,000 bushels. In that year the non-irrigated lands produced 18,561,213 bushels of corn on 1,356,594 acres, an average of 13.68 bushels per acre. The irrigated lands produced 3,848,787 bushels of corn on 137,406 acres, an average of 28.01 bushels per acre. The variation in total production and yield per acre is due to seasonal variability of moisture conditions on the non-irrigated lands, where the bulk of the corn is grown. The acreage on irrigated lands has been increasing in recent years, due to standardization of

*Western Farm Life, October 1, 1919.

varieties and selection of seed, which make corn as dependable as any other field crop grown under irrigation. On non-irrigated lands the yield is variable, following the seasonal changes in rainfall now as in the beginning of dry-land corn growing twenty-five years ago.

FIRST WHEAT OF SPANISH ORIGIN

WHEAT GROWN BEFORE '58.—In previous chapters the fact has been brought out that wheat growing antedated the arrival of the gold seekers, for this grain was one of the principal crops grown by the earliest Spanish-American settlers. Unlike corn, which is native to America and had been grown by the ancient inhabitants of the arid Southwest, wheat dates its introduction to the Spanish colonists who followed the explorers into Mexico and the South American countries and northward up the Rio Grande into what is now Colorado.

Wheat of Spanish origin made bread for the emigrants at Denver and Auraria as early as the winter of 1859 and during 1860, and that was true until wheat brought in as seed over the plains had been grown, ripened and milled. Flour from the mills of Taos and San Luis, already mentioned in one of the opening chapters of this volume, was made from Sonora wheat, "el trigo Sonoreno." This variety is still grown extensively in New and Old Mexico. In the old days it was a favorite with the Mexicans, because it was easy to crush and grind in the metates, or hand mills, consisting of a stone bowl and a grinding stone. The women ground the wheat. They do it today in the Mexican villages of the Southwest, as anyone who has entered their dwellings and eaten tortillas made from this grist can testify.

Amado Chaves of Cowles, New Mexico, writes in answer to a question about the wheat:*

EL TRIGO SONORENO.—All I know is that from the earliest days of the Spanish settlements, the Spaniards raised wheat. At first only one variety was grown and that is raised to this day all over New Mexico. It is called "el trigo Sonoreno," the Sonora wheat. It is a soft variety and as the women had to grind it in metates it was a favorite wheat. Afterwards, little water mills were put up along the streams and that relieved the women from much work. From the name we must conclude that that wheat came from Sonora. There was a very fine wheat raised called "trigo flor," but I am not sure if it was the same as the Sonoreno. I used to raise very fine wheat in San Mateo. At one time many years ago, Don Nazario Gonzales, who lived at La Cienega, a few miles from Santa Fe, killed a wild goose and inside found seven grains of wheat different from any he had ever seen. It was very large, very hard and rather dark. He planted it and it gave a very large yield, twice as much as the Sonoreno. He gave me some of the seed and I planted it in San Mateo and it yielded three times as much as the Sonoreno. In time, that wheat was planted in many of our counties. It did not become very much liked, because it was very hard and our little molinos could not handle it. Where in the world that wheat came from we never could find out.

It was quickly recognized in the new settlements that flour from Taos would not suffice for the wants of the communities; that the trip across the

*Letter to Chester A. Lee, Extension Service, Colorado Agricultural College.

plains was too costly to look eastward for a steady supply and that if the miners and camp followers were to be kept from hunger wheat must be grown nearby.

TWO HEADS OF WHEAT.—The first wheat grown in Colorado, from seed that in all probability was brought by immigrants, consisted of exactly 148 grains. This handful was the yield of two heads that matured on one plant, accidentally seeded with corn in the gardens of Messrs. Parkison in Denver. Corn was planted in June, 1859. Later in the summer the gardeners noticed the wheat plant, which was then beginning to head out. They did not disturb it until it had matured, in the latter part of October, and then the heads were pulled and the kernels counted.

As was customary with any discovery, either of the mines or the gardens and farms which were being started, the discoverers called on Editor Byers of *The Rocky Mountain News* to tell him all about it. So we have, under date of October 27, 1859, the following detailed account of the first wheat grown in the Pike's Peak region from seed that came with an emigrant train:

Mr. McClure has shown us one hundred and forty-eight grains of wheat, the yield of two heads, grown in the gardens of the Messrs. Parkison, in Denver City. The grains are very large, fully one-third larger than the best we ever saw in the eastern states, and fully equal in size and weight to the famous wheat of California and Oregon. We have not a doubt that millions of acres of our plains and mountain valleys will produce wheat that for quantity and quality, the world cannot excel.

That the pioneers appreciated the significance of the incident is apparent from the fact that, thirteen years later, Judge Belford, later Congressman and known as "the Red-Headed Rooster of the Rockies," mentioned this discovery in an address. This address was delivered at the Industrial and Agricultural Fair in Denver, during October, 1872, and the paragraph to follow is quoted therefrom:

On the twenty-eighth day of October, 1859, a discovery was made destined, under the providence of God, to change the complexion and character of this section. In a garden, in this city, were found growing two stalks of wheat, nature's first auspicious rebuke to man's ignorance and infidelity. That they elicited curiosity and remark cannot be questioned, for there lay in them all the possibilities of our future. From their roots, agriculture drew her inspiration and hopefully marched forward to establish the existence of the coming millenium, by realizing the prophetic prediction that the desert shall blossom as the rose. From this feeble beginning, our growth in all things needful to constitute a great state, has been increasing and substantial.

TRIED IN 1860.—In 1860 several farmers sowed wheat. On August 22 of that year *The Rocky Mountain News* mentioned the fact that a sample of wheat had been brought in from the farm of A. C. Hunt and Company, "ten miles below the city," by M. C. McAfee. This wheat was from Mexican seed, only a small patch having been sown experimentally. The estimated yield, according to McAfee, was 40 bushels per acre and the estimated weight 63 pounds to the bushel, *The News* commenting: "It would undoubtedly give over 50 pounds of flour to the bushel of wheat."

S. W. Brown, whose farm was eight miles above Denver near Platte bridge (Brown's bridge), sowed both wheat and oats that season and brought samples to town in August to show to the editor, whose comment was: "He raised but a small patch of either simply for an experiment. His wheat, he thinks, will yield 35 bushels to the acre and the oats near, or quite, a hundred." (Rocky Mountain News, August 8, 1860.)

URGING WINTER WHEAT.—While these tests of spring wheat were being discussed someone was trying out winter wheat. The following June The Rocky Mountain News announced (June 15, 1861) that there would be a large demand for winter wheat for sowing "the latter part of August." Early fall sowing seems to have been taken for granted.

"A few fields of wheat that are now growing promise fine crops, but every pound has been engaged in advance at 15 cents per pound, and there is a demand for from one thousand to five thousand bushels more. Some of our traders and freighters will make a handsome speculation by bringing in a supply from the states. It should be here to sow in the latter part of August," said the Rocky Mountain News (June 15, 1861).

This advice was taken, and, early in August an advertisement appeared signed by M. E. Post, who said he had both wheat and rye from "the States" for sale as seed. The News urged its farmer readers to buy seed. "Raise your own bread," was the pointed advice given—and taken.

Barley was also being grown that season, for H. O. Norton, residing a few miles south of Boulder, came to Denver with a sheaf of barley which he had harvested the middle of July. Norton announced his intention of sowing barley again, his first effort having been quite successful.

Thus began the growing of small grains. Each season witnessed increases in acreage as the country developed. Improvement in strains and standardization of varieties did not begin until after the Agricultural College was established. During the first twenty-five years the only problem was to satisfy the demand for bread. This job was well done by the pioneer farmers and millers.

A BIT OF KANSAS HISTORY.—Eastern Colorado, as winter wheat territory, is an extension of the hard wheat belt of Kansas, the same varieties being grown and under almost the same conditions. Turkey Red and Kanred are the principal varieties. Turkey Red is said to have been brought to central Kansas by Russian Mennonites, who were colonized along the line of the Santa Fe during the middle seventies. Kanred is a strain developed by the Kansas State Experiment Station and introduced in eastern Colorado in the last decade.

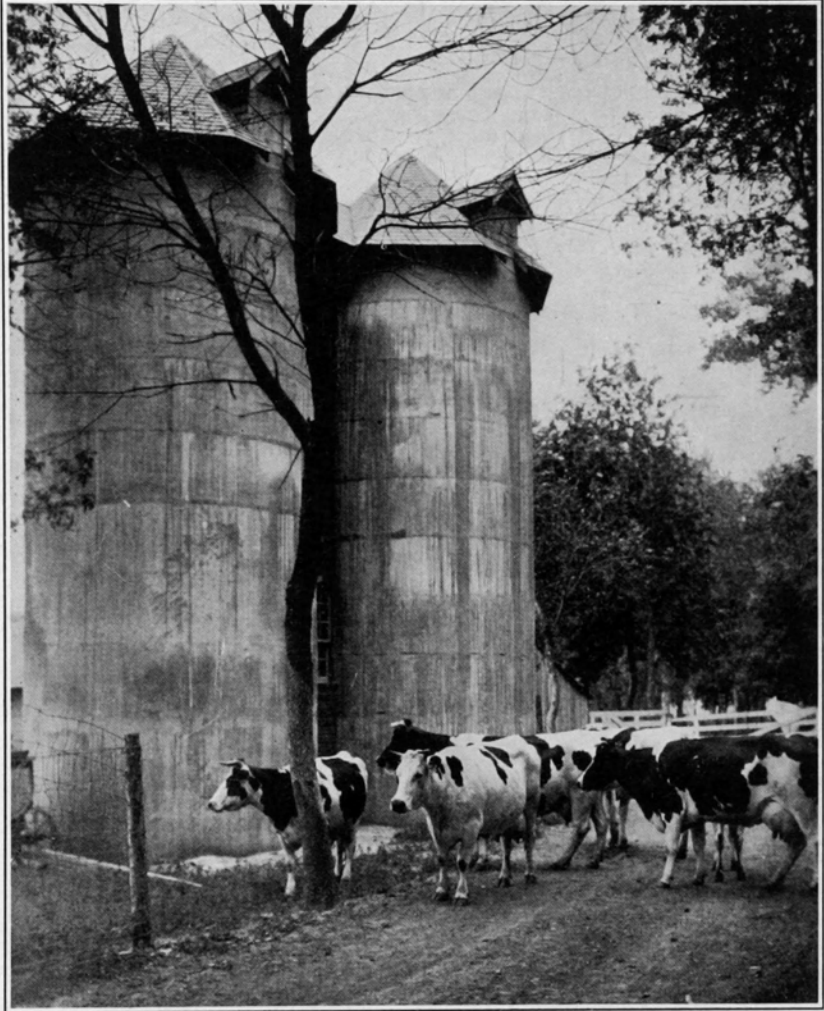
Prior to the coming of the Mennonites some winter wheat was grown in the Arkansas River region of Kansas, the introduction of seed from Iowa

being due to the grasshopper visitation of 1874. D. N. Heizer, who, in 1925, was a resident of Colorado Springs, was instrumental in bringing this seed to Kansas in 1874, at which time he was land agent for the Santa Fe at Great Bend. His own statement of this introduction follows:

The first of July (1874), we, the primitive settlers of Great Bend, had a good prospect for a crop—wheat, rye, sod corn and other crops. Before the middle of July, clouds of grasshoppers came down and devoured every living green thing for two hundred miles up and down the Arkansas Valley. Something had to be done to keep these early settlers in the country. It was their first crop and the grasshoppers had cleaned it up. I used my influence to get them together and suggested that we try to get some winter wheat for our plowed land. After everybody had expressed a willingness to sow a certain amount, I went to the Land Commissioner of the Santa Fe, A. E. Touzalin, at Topeka, and laid the situation before him. He at once agreed to furnish the seed at cost, freight free, and to take one year notes at six per cent in payment. I went back to my old home in eastern Iowa and bought seed, shipped it to Great Bend, and helped distribute it. That was the first winter wheat introduced in the valley of the Arkansas in quantity. I distributed about 15,000 bushels and it produced a wonderful crop.

STAPLE CROP FROM BEGINNING.—As will be evident from the foregoing, wheat has been a staple crop from the beginning of farming in Colorado. For twenty years its status did not change materially, no attempts being made at improvement, or toward introduction of new varieties until the Agricultural College was established. What was done, beginning with 1883, on the College farm and from 1888 on the State Experiment Station, is reviewed in the chapter devoted to experimental work. During the previous years the only attempts at maintaining yields seem to have been in the practice of farmers in exchanging seed. Growing wheat after wheat on the same land was the rule, only the exceptional farmer practicing crop rotation. There was a widely prevalent belief that irrigation alone enhanced fertility, the theory being that the water carried mineral elements in solution that were beneficial to crops. In time it was learned that other things besides water were essential in maintaining yields of wheat, as of all crops.

While Colorado's rank among the wheat producing states is not high in quantity, the average yield on irrigated land is very high. For the 1925 crop it was 27.27 bushels per acre. The general average is, however, pulled down by the acreage grown without irrigation, which represents the bulk of the winter wheat. The spring wheat average in the United States is 15.9 bushels per acre; that of Colorado is 16 bushels. The winter wheat average of the United States is 16.2 bushels; that of Colorado is 14 bushels. The state ranks eighth in quantity production of spring wheat and thirteenth in quantity production of winter wheat, based on the 1925 crop. In that year Colorado harvested 3,780,000 bushels of spring wheat and 10,752,000 bushels of winter wheat. The total farm value of that crop was \$19,726,000.



Silos and dairy herd at Colorado Agricultural College.

DEVELOPMENT OF DAIRY FARMING

BUTTER AND CHEESE IN '59.—As early as October, 1859, an enterprising farmer, J. J. Minter, whose place was known as the Hermitage, brought butter and cheese to Denver. The Rocky Mountain News of October 15 described Minter's butter as being "equal to the best Orange County. It is manufactured at his extensive stock ranch and dairy ten miles below the city."

The next mention of dairy products produced in Colorado appeared in the Rocky Mountain News of July 18, 1860, as follows: "J. B. Doyle and Company have a large supply of Huerfano-made cheese. In this connection we desire to tender our thanks to Mr. Kroenig and Mr. McLaughlin and Mr. Dunn for a generous supply of the first lot of cheese made at the foot of the Rocky Mountains. In our opinion it is fully equal, if not superior to, the famous Western Reserve."

Milk and butter were on sale almost immediately after settlers began to arrive. The first butter coming from a distance reached Denver in March, 1860, from D. P. Walling of South Boulder Creek, where Walling had started a dairy. He was using power from the creek to do the churning.

J. Ehle brought cheese to Denver from his claim on Clear Creek, five miles northwest of the settlement, in 1861, Editor Byers acknowledging the visit in the Rocky Mountain News under date of June 6. The editor spoke of it as "an immense cheese from his dairy on Clear Creek." The article went on to state that Ehle was an experienced dairy farmer and that he intended to make large quantities of cheese for the Denver market. There was much demand for the article from prospectors outfitting for the mines.

W. R. Thomas,* describing his ranch visits in northern Colorado in 1868, said: "The dairy business is not much engaged in, although all the farmers keep more or less cows. Mr. Ryan has made this summer 7,500 pounds of cheese from 35 cows." (That referred to J. J. Ryan, a well-known pioneer of the Big Thompson.)

POUDRE VALLEY HERDS IN '68.—Discussing dairy farming on the Cache la Poudre, Thomas wrote as follows:

The dairy business is engaged in to some extent and butter is no small part of the production of the valley. Mr. T. C. Moore milked fifteen cows and made about 100 pounds of butter to the cow during the season. J. S. Lemon milked 29 cows and made not less than 2,000 pounds. T. G. Arrington milked ten cows and made an average of 100 pounds to the cow. Robert Boyd milked 50 cows and made the same average. He considered his cows worth to him not less than \$50 each season. Messrs. McFie & McKelvey milked 20 cows and made 1,500 pounds of butter. J. H. Pinkerton milked 15 cows and made about 125 pounds to the cow. D. D. Davis milked ten cows, which

*Rocky Mountain News, November 20 and 23; Editorial letters written from La Porte by William R. Thomas.

yielded him \$40 per cow during the season. S. Duncan milked 12 cows and made 1,000 pounds of butter. H. Stratton purchased 22 cows last spring and they have more than paid for themselves this season.

Cheyenne was just opening to the Cache la Poudre farmers as a good market for butter, in anticipation of the building of the Pacific Railroad through Wyoming. In May and June of 1868 Thomas had ridden through almost every valley where farming was under way, but it was only from northern Colorado that he made special mention of dairying, other districts being described with reference to their crop acreage.

COW TESTING RECORD OF 1869.—Cow testing in the modern way was unknown by the pioneer dairy farmers, but production records were kept long before the Babcock tester was invented. What is probably the first record of this kind, kept in Colorado, comes from the Saguache district in the San Luis Valley in 1869. The Rocky Mountain News had asked its correspondents in all agricultural sections to send in reports on crops and agricultural prospects generally. From "F. C. M." at Saguache, which was already a flourishing town and the center of much agricultural activity, due to the mining development just starting in the mountains to the southwest, came the account of dairy herd production which follows:

I give below a statement of milk and butter produced in 1869, by Wales Bros. and Morse on Rito Alto Creek, east side of the San Luis Valley:

1869	Milk, Qts.	Butter, Lbs.	Av. Qts. Milk to Lbs. Butter
June	2,453	225	10.9
July	2,717	266	10.2
August	3,817	377	10.1
September	2,690	274½	9.8
October	1,449	144½	10.0
	13,126	1287	10.2

Average number of cows milked was 16, and each one raised a calf, which took half the milk. The milk used for butter was an average of the lot—no strippings. These cows were purchased in the Arkansas Valley below Pueblo, the latter part of April, 1869, and driven into the San Luis Park the May following. We think the change of pasturage and climate had an effect rather unfavorable than otherwise, from which they recovered before close of the season and we estimate that the product was larger per cow in 1870, but we were unable to keep a minute account by reason of too much other work.—F. C. M.

WET MOUNTAIN VALLEY CHEESE FACTORY.—A cheese factory of considerable capacity was established at Rosita in the Wet Mountain Valley in 1872 by R. E. Neave, who was at the head of a company of English capitalists. At that time the Wulsten German Colony was trying to get a foothold in that region and the opportunities for dairy development appeared to be good. The colony failed, as did this cheese factory, which was said to be the first of its kind in the territory. The buildings included a dairy house and curing room, and a corral and sheds containing stalls for over a hundred cows. The curing room, which had a double wall, had

a storage capacity of 40,000 pounds of cheese and it was equipped with steam pipes for raising the temperature during extreme periods of the winter.

The dairy room was supplied with two metal vats, each having a capacity of 350 gallons. There were six cheese presses and a big churn. A description was given of the factory in the Greeley Tribune of July 24, 1872, from which the following is quoted: "The factory, which has been in operation for two or three weeks, is going on very satisfactorily, 250 pounds of cheese—which, unlike eastern cheese, is made entirely of whole milk—being manufactured daily. Mr. Neave has a large number of cows of his own and takes the milk from several of his neighbors."

What finally happened to the cheese factory was related by Conrad Riester of Steamboat Springs, in a letter to this historian. Riester had come with the German colonists, and after a short time in the Wet Mountain Valley, had secured employment at Denver as a cook. While back at his home in Rosita for a visit he was offered work at the cheese factory and there became familiar with operations. He states that Neave bought up all the good Shorthorn cattle he could get and that a Swiss cheese-maker was employed. For a time the business prospered, but the cheese finally became unmarketable because the milk became contaminated with wild garlic, which was plentiful in the pastures of the Wet Mountain Valley at the time.

AN EARLY VALMONT FACTORY.—Another early day cheese factory was that at Valmont in Boulder County, of which C. W. Hayden, who had come from Jefferson County, Wisconsin, was proprietor. During the middle of summer, 1877, the factory was taking in about 1,900 pounds of milk a day and its patrons, according to a list published in The Boulder News of July 4, '77, included Judge Housel, Robert Moore, G. W. Chambers, Carnehan, Ludlow, Chapman, Coin and Beal. The capacity was given as 3,600 pounds a day, "which would make about 360 pounds of cheese at 20 cents a pound, worth \$72. Hayden takes his pay in cheese at 3 cents a pound for making it," said The Boulder News.

LAGRANGE FED SQUASHES.—B. S. LaGrange, who was a member of the first State Board of Agriculture, had a dairy herd of 40 to 50 cows at Greeley in 1875. He had been running them on the range, but decided in the spring of that year to keep his cows in stables and yards the year around. He bought the Charles Buckingham farm of 80 acres for \$900, adding it to his own place and using the new land to grow soiling crops, such as winter rye to be cut early in the spring, oats, corn fodder and beets, of which he intended to use the tops, and also squashes and pumpkins. The Greeley Tribune of February 3, 1875, in discussing the new plan for

running the LaGrange dairy herd, said: "Mr. LaGrange thinks more of squashes than any other crop, since for a given amount of land and labor expended they yield more tons to the acre than anything else. Red clover should be a good crop, and some think alfalfa unexcelled. Of course, experiments are required in this new and peculiar country, and Mr. LaGrange will make them, upon which we shall know more. The prospect of success in his hands is certainly good."

Another early day dairy farmer at Greeley was S. J. Plumb, county commissioner in 1874, who had just bought a two-year-old bull, Olin, from Mr. Canfield for \$250. His purpose was to build up a dairy herd with Shorthorns, the Tribune stating: "It seems not profitable to have cows that naturally excel as milkers, because Colorado grass is too dry and has a tendency to develop fat and muscle; and therefore it is most profitable to combine dairying with stock growing." (Greeley Tribune, December 2, 1874.)

STOCKMEN LEASED OUT COWS.—A unique plan of leasing out cows was followed by some of the cattlemen who ran range stock in proximity to farms along the Platte in the vicinity of Greeley, during the late seventies. Farmers would select a few good milk cows that could be spared from the range herd, and pay \$10 a season for the use of them, the farmer giving feed and care and getting the milk as his return.

A HIGH ALTITUDE DAIRY.—Opening of the San Juan country with Lake City, Ouray, Silverton and other notable camps, induced producers of food to make an attempt at supplying perishable necessities. Among the complete records available of a high altitude dairy farm is that covering the operations of Robert T. McGrew and James Downey at Antelope Park in the Cochetopa hills (altitude 9,000 feet). This dairy was started at Silverton in 1875 with twelve cows, which were milked four months that season, the milk selling in Silverton at 50 cents a gallon. During the winter that followed the cows were taken to the Brown Brothers Ranch, on the lower Saguache, and in the spring of 1876 driven up to Antelope Park. According to the Saguache Chronicle, it was "the highest butter dairy in the country." Milk was made on grass alone. The herd had been increased to 62 head, and finding better range in Antelope Park than at Silverton, the cows seemed to have produced well in their new location.

Butter-making was the chief business, though milk was sold at 25 cents a pan to passing wagon trains and was considered a luxury by freighters and tourists. Butter-making started May 15, and the price from then to July 1 was 75 cents a pound at the ranch, dropping to 60 cents from July to September 1, and advancing again to 75, where it remained until the last of the season's product had been disposed of, late in November. The

cows were milked twice a day and butter was made up in five-pound rolls and sold in the mining camps.

PRODUCING FOR CONDENSERIES.—Dairy farming has continued to develop as a separate branch around the centers of population to supply the towns and cities with milk, and the record of that business has not differed essentially from the general experience of the dairy farmer in other regions. The dairy herd as a part of the farm establishment, is, however, another line of development, the product from which has gone to the condenseries and the creameries. This development has been of especial benefit to the dry land region, where the dairy cow has converted cultivated forage crops and grass into milk at comparatively low cost, the producer selling the cream at the station and getting cash for it. This business is carried on largely with grade cows of dairy strain, mostly of the Shorthorn type, though Holstein herds have, in late years, become more numerous on the dry land farms.

In the irrigated sections there are many dairy herds, particularly in the condensery districts, high production being the rule under the better feeding conditions possible where alfalfa is the foundation of the ration. Holsteins predominate, but there are also many herds of the Jersey breed with some Guerneys and a few Ayrshires.

THE JOHNSTOWN DISTRICT.—Dairy districts have been built up, such as that around Johnstown, where a condensery started the development nearly twenty years ago, which has resulted in establishing high production herds of various breeds. The Johnstown dairy show, a neighborhood exhibition, has attracted attention among breed followers all over the western half of the United States, and Johnstown Cow Testing Association records are quoted wherever educational work is being done in dairy development. Two outstanding accomplishments are pointed to in the Johnstown dairy district, as a result of the dairy development—the fertility of the soil due to the manure put back on high-priced irrigated land, and the high level of bank deposits in the Johnstown bank, which was largely responsible for getting farmers busy with the milk pail.

Other sections of the state where the agricultural program seemed already well filled, have noticed, through the experience at Johnstown, that even three-hundred-dollar land may be made richer in profits by the addition of a dairy herd to the production machinery on the farm.

Dairy farming would be well worth more lengthy treatment, though the discussion would verge upon the industrial rather than the agricultural side of the industry. Many fine herds of registered dairy stock are maintained in the state and it is scarcely necessary now for the farmer to go beyond the state's borders for foundation stock.

WORK OF THE DAIRY COMMISSIONER

The 19th General Assembly passed a dairy code repealing all prior legislation and making the head of the Animal Husbandry Department of the State Agricultural College ex-officio State Dairy Commissioner. Professor George E. Morton was head of the department at the time the act went into effect, August 8, 1913, and has been Dairy Commissioner since that time.

The chief lines of work during the first biennium were licensing of cream and milk testers, prevention of unwarrantable creamery promotion, prevention of sale of tubercular dairy cattle, and enforcement of oleomargarine legislation.

In 1915 and again in 1917 the General Assembly strengthened the work of the commissioner by increasing appropriations, and the workers now consist of the commissioner, one deputy, one fieldman, one chemist, and four inspectors. Creamery promotion by exploiting companies was ended promptly, and there has been no attempt made at it since 1915. No attempts at shipping in and selling tubercular cattle have been made since 1913. No imitation condensed milk has been sold in the state since 1918, some sale being permitted during war time. Oleomargarine violations have become practically a thing of the past.

Testing of milk and cream for purchase has been brought to a high standard of accuracy and honesty, although because of new men constantly entering this line of work, it requires regular supervision.

The commissioner drew up the present code of dairy laws of the state, and in 1923 was given the power of issuing regulations. This power has been used as sparingly as possible, and covering broad policies rather than details. In 1923 also the commissioner was empowered to license all dairy plants and cream and milk receiving stations.

In 1918 the creamerymen of the state were called together and a creamerymen's organization started. This organization gathered strength rapidly and has remained as the chief technical clearing house of the dairy manufacturing industry of Colorado. The first cow testing association in Colorado was started among dairy farmers surrounding Denver about 1910. E. K. Risser, working for the Dairy Division of the U. S. Department of Agriculture in co-operation with the Animal Husbandry Department of the State Agricultural College, founded this organization, and since 1913 the development of cow testing work has been handled by the Dairy Commissioner. There are now five such associations in Colorado, namely: Johnstown Cow Testing Association, Boulder County Cow Testing Association, Brighton-Denver Cow Testing Association, Mesa County Cow Testing Association and Pueblo County Cow Testing Association.

Quality of product has been bettered through butter scoring contests, cream grading and milk scoring. Denver, Colorado Springs, Pueblo, Otero County, Greeley and Boulder are scoring milk regularly under the auspices of their health departments, the Dairy Commissioner's office and the western office of the U. S. Dairy Division.

Dairy development work has been carried on in a conservative way in different sections of the state. Only one intensive development campaign has been undertaken. This was in the San Luis Valley, where conditions seemed to demand a considerable expansion of dairying. The Development Department of the Denver Chamber of Commerce, the Denver & Rio Grande Western Agricultural Department, the American Holstein-Friesian Association and the State Dairy Commissioner organized the San Luis Valley Dairy Association in 1922 on a basis of five years' work. Financial support comes from owners of dairy herds, bankers and others interested. The result has been a remarkable development of the industry in the valley.

Two policies originating in this department have resulted in marked improvement in cream buying conditions. In 1923 what is known as the Colorado modern type cream station was brought into existence. It was ruled that where two or more cream buying agencies existed in a town, thus giving a competitive market, no new station would be licensed unless it met certain requirements, chief of which were a room entirely separate from other business with a street entrance, a concrete floor, floor drain, a minimum floor space of 192 square feet and window space at least one-sixth of the floor space. So marked an advance has been made by these stations that now any first station starting in a town situated on a railroad must be modern type, and any station changing ownership or location must be brought to modern type. In this way a gradual improvement is being made, without too great a financial burden upon the industry in any one year.

The other policy of note is entire separation of live poultry business from cream stations. Poultry must be handled in a separate building, at least fifty feet from the cream station.

These advances, and others not so noteworthy, have been secured with the consent and co-operation of the creamerymen themselves. The definite policy of the commissioner has been to secure improvement through education and co-operation rather than compulsion, so there have been very few prosecutions, and those only in cases where other methods failed.

FORESTRY AND ITS RELATION TO AGRICULTURE

TIMBER AN AGRICULTURAL CROP.—The forest resources of the nation are under supervision of the United States Department of Agriculture, and

timber is everywhere recognized as an agricultural crop. In Colorado and other western states forests are of double significance to agriculture. These states have a semi-arid climate, making irrigation necessary for maximum crop production. Forests protect the watersheds, holding back the melting snow, reducing evaporation and maintaining streams at an even flow. Aside from protective value of the standing timber, trees may be grown as a crop to supply posts and fuel on the farm, for shelter-belts and wind-breaks, to protect the soil and prevent blowing, as well to enhance living conditions on the plains by making surroundings of the home more attractive and agreeable. From the manuscript of W. J. Morrill, State Forester, prepared for the History of Colorado, issued under auspices of the State Historical and Natural History Society, facts of historical interest have been gleaned, the selections that follow being made on the basis of their relation to agriculture:

RECOGNIZED BY THE CONSTITUTION.—Colorado has the distinction of being the first state to incorporate in its constitution provisions recognizing the need for forestry and authorizing the enactment of laws for the preservation of forests. The state owes this to the fact that Frederick J. Ebert, a pioneer citizen of Denver, professionally trained as a forester in Germany, was a member of the constitutional convention. At his suggestion, the convention appointed a committee on forest culture, of which Mr. Ebert became chairman. He urged establishment of a state forestry bureau and made other recommendations far in advance of public opinion of the time. While but two of his recommendations became a part of the organic law of the state, these provisions nevertheless committed Colorado to the cause of forest preservation from the beginning of statehood.

The sections recommended by Ebert and made a part of the constitution are six and seven of Article XVIII, reading as follows:

PRESERVATION OF FORESTS.—The General Assembly shall enact laws in order to prevent the destruction of, and to keep in good preservation, the forests upon the lands of the state, or upon lands of the public domain, the control of which shall be conferred by Congress upon the state.

LAND EXEMPT FROM INCREASE TAX.—The General Assembly may provide that the increase in the value of private lands caused by the planting of hedges, orchards and forests thereon shall not, for a limited time to be fixed by law, be taken into account in assessing such lands for taxation.

*It is interesting to note that in 1876 the Federal Government was not believed capable of administering and protecting federal forests in Colorado or elsewhere. It was hoped by many in this state at that time that the Federal Government would be persuaded to turn over to the state the control of the federal forested lands. A memorial accordingly was prepared and sent to our delegate in Congress, the Honorable Thomas M. Patterson,

*Manuscript, Chapter XIII, Forestry, State History, by W. J. Morrill.

asking for state control of the forests on the public domain, but to no avail.

FIRST LAWS IN 1881.—Although the above-mentioned forestry provisions in the constitution gave authority, no forestry laws were passed until 1881, when a tax rebate was granted, to the effect that lands planted with trees should not be appraised at a higher amount because of these trees during the period of ten years and that a premium of \$2 per hundred trees planted shall be paid to the owner.

As no provisions or procedure were created for the payment of the premiums, the law was rarely if ever employed, although many trees were planted. It was just as well that this omission occurred, since it has been the history in all states that rebates never resulted in much tree planting. Mr. Ebert's views were somewhat too advanced for Colorado of 1876, or for any part of the United States at that time, as forest destruction by fire and cutting continued apace with little thought by the people as a whole, although a few were aroused to action, notably Col. Edward T. Ensign of Colorado Springs. He wrote in 1884 a series of articles entitled "Forestry in Colorado," appearing in the Colorado Springs Gazette. These articles inspired support by other newspapers and many citizens, leading to the organization of the Colorado Forestry Association at a convention in the State House in Denver in November of that year. This was the first public organized forestry movement in the state. Again Congress was urged to give to Colorado the control of the public domain forests. If Congress would not do this, Congress was requested to provide proper protection itself. The legislature was requested to pass some forestry laws, carefully considered by the Forestry Association, and to create the office of Forest Commissioner, which was done in 1885. The law passed was far in advance of nearly every state in the Union. * * *

The manuscript goes on to relate that no appropriation was provided, either for salary or for expenses, but that Colonel Ensign, appointed as Forest Commissioner by Governor Eaton in 1885, patriotically assumed the office and performed the duties faithfully without pay for two years. (Referring again to the manuscript.) Colorado endeavored to obtain control of the public timbered lands in order to protect them, at or before the admission of the state into the Union in 1876. Eight years later the Forestry Association, actuated by the same motives, recommended the same action, and two years later, having despaired of state control, asked Congress to take measures to save the federal forests. In no small measure was the State Forestry Association responsible for the forest reserve policy which went into effect in 1891. The establishment of National Forests, as they are now designated, was bitterly criticized at first as being un-

American, Socialistic and certainly revolutionary in our history of the handling of public lands. * * *

WHITE RIVER RESERVE.—The White River Plateau Reserve of over one million acres, northwestern Colorado, was the second reserve to be established, following one month later than the Yellowstone National Park Reserve, adjoining the Yellowstone National Park in Wyoming. Other smaller reserves, chiefly in best timbered tracts at the lower elevations, were set aside until in 1903 they numbered six, aggregating only three million acres out of more than thirteen million acres available. The State Forestry Association led in circulating petitions for the reservation of the whole forestry area. The State Legislature, Denver City Council, Denver Chamber of Commerce, Denver Real Estate Exchange, Denver weekly and monthly press, water company, gas company, twenty-six other corporations and business firms of Denver, many of the leading citizens with General William Palmer at their head, long lists from seventeen cities and towns, State Teachers' Association, all of the colleges, the State Grange, ten local Granges, various chambers of commerce, and the State Boards of Agriculture and Horticulture and other organizations, furnished petitions for the extension of the forest reserve policy in Colorado. The policy was not foisted upon the state from the outside. A few years later, however, we shall see an organized effort, temporarily expended, to undo the whole business. * * *

Much of the opposition to the forest reserve was really due to a feeling on the part of users of the resources of these forests that they did not know what oppressive measures might be taken. It was all new and untried. * * *

* * * So far as Colorado is concerned, organized opposition to the U. S. Forest Service came to a head in a public lands convention at Denver in June, 1907. Delegates from most, if not all, of the eleven western states attended, Colorado and Wyoming being more fully represented than the other states. * * * The debates were acrimonious. The credentials of many of the delegates were challenged and the resolutions adopted were largely negative because of patent frauds in representation. The convention was said to be packed with opponents of the U. S. Forest Service. In some way a forest supervisor became a member of the committee which handed tickets to the delegates, and the forest supervisor and his friends became duly accredited delegates. This he did to confuse and disorganize the convention, and the trick succeeded. There was plenty of devious work on both sides. However, little came from the convention, unless it served as a safety valve to vent ill will to the national forests and thus relieve the pressure, for shortly the opposition died down.

STONE'S GREAT SERVICE.—The manuscript mentions the great service done by William G. M. Stone, for twelve years president of the Colorado State Forestry Association, to the cause of forestry. (Referring again to the manuscript.) An incident of the attack on the United States Forest Service in 1907 was the testing of the authority of the government in prosecuting owners of livestock in trespass upon the national forests. The forest regulations forbid grazing without a permit upon the national forests. Fred Light, a stockman on the Western Slope, backed by the State Cattle Growers' Association, in a "friendly" suit with the government, attempted to prove that the rules and regulations of the United States Forest Service, as promulgated by the Secretary of Agriculture, did not have the force of law. His stock were purposely permitted to cross over the unfenced boundary of a national forest, on which he had secured no permit and had paid no grazing fees. * * * In all of these contentions the government won in the Federal District Court and the case was not appealed to the U. S. Supreme Court. This strengthened the hands of the administration of the national forests and contributed to the acceptance of the federal forestry policies.

Forest tree planting in the great plains region began with the settlement of the non-irrigated lands for crop production, which became important less than a score of years ago. * * * In 1909 the Colorado Agricultural Ex-



Dry land tree planting demonstration at Akron Field Station.

periment Station, co-operating with the United States Forest Service, planted on the sub-station farm at Akron, Colorado, nine species of broad-leaved trees, and in 1911, seven species of conifers in a shelter-belt, extending

around the north and east sides of the 160-acre tract, which was granted to the Agricultural College by the government for this special purpose, as well as for dry-land experimental farming. Since 1911 the State Forester has used this experimental tract for the study of the behavior of these species in that region typical of eastern Colorado, and other species have been introduced in later years.

In order to encourage the planting of suitable hardy species, the State Forester, since 1917, has distributed at cost forest tree seedlings in quantities up to 100,000 a year to farmers in all parts of eastern Colorado. It is believed from inquiries conducted that 59 per cent of the seedlings of all species survive for at least three years on the non-irrigated lands and 72 per cent on the irrigated lands. * * *

ONE-SIXTH OF STATE FORESTED.—Statistical information from the manuscript is to the effect that one-sixth of the state, the mountainous portion, is still largely forested. Eleven million acres originally were covered with timber suitable for lumber, ties, fuel and posts. This area has not been reduced by more than 1,300,000 acres of cut-over, repeatedly burned-over land, not restocking with trees or cleared for agricultural purposes.

The forests of Colorado contain upwards of 30 billion board feet, of which the seventeen national forests, wholly or partly in the state, contain 22.5 billion, or 75 per cent of the total. In few states, if any, is such a large percentage of the total forested area under forestry management. The state-owned timbered lands comprise about 110,000 acres, mostly school sections, found in most of the mountainous regions. The national forests in Colorado comprise 13,249,150 acres, which includes alienated lands, parks, high meadows, barren land and areas about timber line. Nearly one-half of the ten million acres of timbered land has never been cut into. "Consequently, we buy from outside the state over six times as much lumber as we cut in the state, and are actually growing at present more wood annually in the state than we are cutting. Few states today are storing up wood faster than they are cutting it."*

BEES BROUGHT BY IMMIGRANTS

MCBROOM HAD FIRST COLONY.—The first colony of bees brought across the plains by ox team, of which there is any record, belonged to Isaac McBroom, who settled on Bear Creek between Petersburg and Fort Logan in 1862. A comb of honey made from Colorado bloom was brought to the office of The Rocky Mountain News by McBroom in the fall, so that record

*MSS. "Forestry," by W. J. Morrill in State History.

might be made of the fact that beekeeping could be followed in the new country. The incident was noted in the issue of October 23, 1862, under the caption "Pike's Peak Honey."

According to a brief historical sketch by H. Knight, at one time secretary of the State Bee Keepers' Association, McBroom's bees did not survive the winter of '62-3. Knight's sketch, entitled "Colorado Apiculture," states that another colony of bees was brought across the plains by A. C. Hunt in 1866 and that these bees also failed to over-winter.

David J. Lykins, who came to Colorado in 1859, was the pioneer bee-keeper of Boulder County. He started with two colonies of bees, brought overland by a relative several years after Lykins had settled on the Little Thompson. The exact year is not known. In Jefferson County the pioneer bee man was F. J. McQuiston of Ralston Crossing, who brought a colony in a log gum from Coon Creek, Iowa, in the fall of 1863. He sold honey to the miners at Central City at \$1 a pound.

COMMERCIAL BEGINNING IN 1870.—The commercial beginning of the industry dates back to 1870, when a carload of bees was brought in over the Kansas Pacific and sold at \$25 a stand. This started several bee-keepers in business. Among the early commercial honey producers was a Dr. King, who got a stand of bees from Indiana in 1870 and began operations that year on Clear Creek between Denver and Golden. He moved to Boulder in 1877, where he conducted the Italian Apiaries for several years. Another commercial bee-keeper in that period was R. A. Southworth of Littleton, who began in 1875. Among the early commercial producers in Larimer County were Will Amos and N. C. Alford of Fort Collins, who shipped the first carload out of that county to Denver. Alford produced eight tons of that lot.

The following is quoted from Knight's sketch, which was published as a souvenir for the Denver meeting of the National Bee Keepers' Association in September, 1902:

"Before the introduction of alfalfa into Colorado wild flowers furnished a scanty supply of nectar, and the bees were often short of stores for winter, and spring would bloom forth with but few bees to kiss her flowers, they having died of starvation. With alfalfa came the red, white, alsike and sweet clovers, until now thousands upon thousands of acres of alfalfa, thousands of acres of red clover and miles of ditches and streams are lined with sweet clover, and many pastures and fields of white and alsike clovers are to be found. Of the indigenous plants, clemone (Rocky Mountain bee plant) is best, and it has increased rapidly since the advent of civilization, so that today the honey flow is considerably prolonged in regions where it abounds."

STATE ASSOCIATION FORMED.—Knight states that the state association was organized in Denver in 1880 by J. L. Peabody, E. Milleston and Olive Wright. It was incorporated as the Colorado State Bee Keepers' Association in 1888. The Uncompahgre Valley Bee Keepers' Association was organized at Montrose in 1890, with J. T. Hartop president. In 1891 the Northern Colorado Bee Keepers' Association was organized at Longmont, with R. L. Coffin president and D. L. Tracy secretary. The Weld County Association was formed the same year, with D. S. Beal president and H. E. English secretary.

The honey crop for the season of 1892 was estimated at 1,760,000 pounds, which was below normal for that period. The price averaged about 11 cents a pound to the producers. Foul brood was making inroads on the bee colonies of the state at that time and prospects were rather gloomy. In 1877 prices had been up to 18 cents and the industry prospered for eight or nine years after that, but reached its lowest point for the period in 1892. Ten years later the prospects were brighter and there were then about 75,000 colonies in the state.

Delta County made an early start in honey production after the lands were open for settlement. W. D. Brown of Delta shipped in twenty colonies in 1883. Bee-keeping grew on the Western Slope along with the development of orchards.

PRESENT STATUS OF INDUSTRY.—A statement covering the present status of the industry comes from R. G. Richmond, Deputy State Entomologist, in charge of investigations and inspection for the industry, as follows:

"Honey is produced in the state from the lowest elevations of the Platte and Arkansas Valleys up to and including 7,500 to 8,000 feet. The high and dry climate and types of sources provide a honey of flavor and body unexcelled anywhere in the United States. The color varies somewhat, but as a rule is of a white to light amber. The number of colonies in Colorado varies considerably from time to time, but from latest data available may be estimated at 100,000. One-half of this number are in the irrigated sections of western Colorado. Delta County has over 7,000 colonies and Mesa over 6,000, being the most densely populated with bees of the West Slope counties. These counties shipped out of the state in 1923 forty carloads of honey, of which approximately 75 per cent was comb honey. More than an equivalent amount was shipped from eastern Colorado, consigned to points out of the state. Present production is estimated at over five million pounds a year."

AN ANCIENT CROP REVIVED

It often happens that a discovery is made and announced as something new which, after the first enthusiasm wears off, is found to be but a re-discovery of something well proved and time honored. This is true in farming as in all other branches of human activity. The use of sunflowers as a forage crop is a case in point. It seemed a new idea to George La Grange, a Jersey cattle breeder and dairyman at Grand Junction, Colorado, when Fred W. Merrill, representative of a cream separator company, in the spring of 1916 suggested to La Grange that he try sunflowers as a silage crop. A small patch was planted by La Grange, but a neighbor put in a larger acreage and made a silage test. The result was all that Merrill had promised—a much larger tonnage per acre than could be obtained from corn and a palatable and nutritious silage that stimulated milk flow.



Giant or Russian sunflowers, grown for ensilage.

Merrill brought the information about the crop from a reclamation project in Montana, where tests had been made. County agents in Delta and Montrose Counties got farmers interested and demonstration fields were planted. The crop yielded tremendously under the highly favorable soil, sun and water conditions in those two counties, but difficulty in cutting the rank growth and the watery silage that resulted were discouraging features. However, in higher altitudes, as in Saguache County and other San Luis Valley localities, where corn does not ripen to silage stage, sunflowers seemed adaptable. The advantages are quick growth, reaching a stage of full bloom before fall frosts and tonnage far in excess of any other forage suitable for ensiling. The variety grown is the Russian, or giant, sunflower and not the native wild sunflower.

TESTS MADE AT FORT COLLINS.—Tests at the State Experiment Station in Fort Collins proved the advantage of the crop for succulence in the ration for fattening beef. Comparisons were made with corn and other silages and results are available in the publications of the animal husbandry section of the State Experiment Station. While new, the crop now seems established in localities where conditions are not ideal for corn, though tests show the superiority of sunflowers to corn, when considered as silage only. An extension bulletin by the Agricultural College was issued soon after the first tests were begun by farmers on the Western Slope. This bulletin is No. 158-A, by G. S. Ray.

Only after the discussion became general was the fact brought to attention that European farmers had been using sunflowers as forage for generations; that an oil cake made from the seeds was a marketable product used as feed, just as cottonseed cake is used in America. In this country, up to about 1915, the plant had been grown only in gardens for the seed heads, which were used as poultry feed. Now it is grown to a limited extent as a field crop in high altitudes.

OF PERUVIAN ORIGIN?—A Flemish botanist, writing historically about the introduction of sunflowers in Europe, says they were brought to Spain about the middle of the sixteenth century from Peru. Champlain mentions sunflowers in his record of explorations along Georgian Bay in Canada, where he found the Indians growing them, using the seeds for food and pressing an oil out of them which they used on their hair.

While it seems unquestionably true that the plant was brought from South America to Spain, and that its spread in recent centuries over Europe was from that source, historical records show what appears to be an identical plant used on Roman escutcheons, and, furthermore, that this plant was known among the ancient Egyptians. However, when the plant came to the West in very recent years, as forage and ensilage, it was hailed as something new. It is new to the present type of agriculture in the West, though efforts had been made to use it as a forage crop in Canada and in New York State within the last thirty or forty years.

The favor the crop now enjoys in the western irrigated regions, though limited, is due to the work done on the United States reclamation project at Huntley, Montana.

RUSSIA CONTRIBUTES A WEED PEST

THE RUSSIAN THISTLE.—The Russian thistle was recognized as a serious pest soon after its appearance in the state about 1892. In March, 1894, the State Experiment Station, in Bulletin 28, made a full report on infestation and suggested methods of control. The bulletin was by Charles

S. Crandall. Introduction of the plant into the United States in 1873 or 1874 in flax seed brought from Russia and sown in Bonhomme County, South Dakota, was mentioned.

No definite date was given in the bulletin of introduction of the thistle into Colorado. Its existence, however, became known in 1892. It was said to have been brought into Morgan County by a colony of Russians as an impurity in seed wheat. It spread rapidly, and in 1894 was found in seventeen counties, namely: Weld, Logan, Phillips, Yuma, Washington, Morgan, Boulder, Jefferson, Arapahoe, Elbert, Lincoln, Kit Carson, Fremont, Pueblo, Otero, Bent and Prowers.

The bulletin advocated a strong weed law as the only effective means of getting rid of the pest. From South Dakota came the story that Henry Schatz imported some flax seed from Russia; that in the field which grew from this seed came up one pretty plant that was not flax. Neighbors advised Schatz to destroy it, but he said, "No, let it grow and see what it will amount to."

It grew and it has amounted to something in the way of a loss to grain growers on the western plains which can scarcely be estimated. In 1894 figures were published in Colorado farm papers to warn the farmers what it meant, if vigorous steps were not taken to eradicate the interloper. Two million dollars was the loss in the Dakotas for 1902; twice that sum in 1903, when the Russian thistle infested a crop area of 33,000 acres in those two states. These warnings were ineffective in Colorado.

By 1904 the Russian thistle had reached the environs of Denver, spreading out over vacant lots within the city limits. It had such a foothold in Otero County that the La Junta Weed Extermination Association was organized, each member agreeing to destroy all thistles found on his land. Weld County farmers, too, were organized to fight the spread of the weed.

RUSSIAN THISTLE AS FORAGE.—A feeble effort was made to utilize Russian thistles for feed. The State Experiment Station issued a press bulletin (No. 5, July, 1900) on "The Russian Thistle As Forage," by J. E. Payne. This gave analyses of the weed made by the Minnesota Station and summarized letters of experience from Colorado farmers who had used Russian thistles as feed.

Most of the farmers expressed favorable opinions, and one or two were enthusiastic, one man writing, "I think a patch of Russian thistles worth as much for sheep feed as the same area in grass." Many farmers in the dry-land region still cut the thistle when green, stack it and use it for winter roughage. However, the attitude of agricultural teachers is that it must be considered a weed and fought constantly, as it saps moisture in



Ready for Melon Dry at Rocky Ford.

a region where the rainfall is short and cuts the grade of grain with which its seeds are mixed in harvesting.

No effort is made now to fight the weed in an organized way, as it has established itself and become as much a part of the vegetation on the plains as the common sunflower. In fact, it is now found also on the west side of the Continental Divide. There is hardly a section of the state free from this weed.

AGRICULTURAL FESTIVALS AND FAIRS

MELON DAY IN 1878.—Colorado has several unique agricultural festivals, of which Melon Day, held at Rocky Ford during September each year, is the most noted as well as the oldest, dating back to 1878. This festival was originated by Senator George W. Swink, an agricultural pioneer of the Arkansas Valley, who did more for the development of that region than any other individual. Peach Day at Grand Junction, Strawberry Day at Glenwood Springs, Potato Day at Greeley, Pickle Day at Platteville, all are familiar agricultural harvest festivals, designed to direct attention to a dominant industry or crop in a given locality.

Other festivals have come and gone, among them Pumpkin Pie Day at Longmont, Lamb Day at Fort Collins and the Corn Roast which once made Loveland famous but which could not be kept up because roasting ears were scarce in a locality where corn is a minor crop.

In the early history of Melon Day the entire event was handled by Senator Swink, but the celebration soon grew in popularity and attendance to a point where it became more than a one-man affair. It was Swink's idea of advertising the adaptability of the Rocky Ford section for melon growing that prompted him to announce that melons would be given away on a certain September day in 1878 at Rocky Ford.

The country then being very thinly settled, the crowd was quite small, not more than twenty-five people being present, and they being mostly from La Junta, coming in a Santa Fe caboose. Swink cut the melons on the grain door of a box car. Only one wagonload was required to feed the crowd and give them all they wanted to carry home.

In 1879 Mr. Swink gave the same invitation and the crowd was increased to about fifty, mostly from La Junta again. A wagonload of melons was disposed of. A grain door again served for a table, and Mr. Swink did all the carving.

In 1880 the crowd increased to 100 and consumed two wagonloads of melons.

In 1881 there was another increase, two coachloads coming from La Junta. That year a table was built twelve feet long and the melon supply correspondingly increased.

The same growth of attendance was noted in 1882, the pile of melons steadily growing, so that all wants were supplied. During all these years the feast was served in the old Swink store adjoining the Santa Fe track.

In 1883 there was another marked increase in the crowd, and the table for melons was transferred to the grove north of town, which was a part of Mr. Swink's timber claim, which has the distinction of being the first timber-culture claim proved up on in the United States. The feast of melons was accompanied by a basket picnic, a table being built separate from the melon table. On this the ladies spread a dinner for the visitors. Adjacent to the two tables was a display of plums, grapes and apples, which were given to the crowd before the day ended. This was the beginning of the now celebrated Rocky Ford fairs of the Arkansas Valley Fair Association.

In 1884 there was another increase both in the crowd and the size of the melon pile. The free dinner also was enlarged in quantity and improved in quality. The ladies of Rocky Ford took great pride in preparing a fine dinner. The display of horticultural products was made a feature again. Thus each year more came until the attendance in 1888 at the fair on Melon Day reached 1,500. In late years more than 10,000 watermelons and several thousand cantaloupes have been distributed to the crowd.

Melon Day will always be celebrated on the first Thursday in September, for the reason that Senator Swink donated 80 acres of his old timber claim to the Otero County Fair Association for use as fair grounds. There is a proviso in the deed specifying Melon Day must be observed annually on the date mentioned with a free distribution of melons; otherwise the property will revert to the Swink estate.

POTATO DAY AT GREELEY

FIRST POTATO BAKE IN 1895.—Potato Day at Greeley was another of the agricultural festivals featuring a special food crop grown in a particular community. Unlike Melon Day, it has not been continuous. Greeley's first Potato Bake was held October 15, 1895, and, according to newspaper accounts, it was a success, drawing a crowd of several thousand, many of whom were obliged to go without a baked potato because of the unexpected rush of guests. Greeley people took advantage of the occasion to tell the story of potato growing, which at that early day had become the leading industry of the district. A souvenir program, issued by The Greeley Tribune, for distribution on Potato Day, gave a brief sketch of the Union Colony and had much interesting information about the potato crop.

Names were given of prominent business and professional men who had made money growing potatoes. Among these were Henry De Votie, who, it was stated, frequently realized \$5,000 to \$7,000 from potatoes grown on a quarter section of land in a single season. Originally he was a farmer, but he had become a banker. David Boyd, historian of the colony and a member of the Legislature, was a potato grower. Benjamin H. Eaton, ex-governor, farmer, irrigation promoter, made money growing potatoes, as did Charles F. Mason, S. A. Bradfield, B. C. Reinks, N. D. Bartholomew, A. D. Clark and J. Max Clark.

The last named was, in 1895, a writer on *The Greeley Tribune*. He was credited in this souvenir program with being one of the first "if not actually the first to discover the mine of wealth that lay beneath our feet in the cultivation of potatoes." He began growing them in 1871 and had marketed from his 80-acre farm in a series of years more than \$30,000 worth of potatoes. He had repeatedly sold \$3,500 worth in a single season. Quoting again from the program: "He is often asked regarding the possible profits from land in this vicinity and he has frequently declared that his farm has averaged, above every species of expense, including taxes and labor employed, 10 per cent on a valuation of \$10,000 for the whole period of twenty-five years, since he homesteaded it from the government. He predicts that, as the country becomes settled compactly, when all the available land is brought under cultivation, every acre of land within five miles of Greeley will be worth in the market \$250 or more."

Among the committeemen who officiated at the first Potato Bake were W. M. Boomer, D. F. Camp, Fred E. Smith, I. Rothchild, H. E. English, Bruce G. Eaton, James G. Milne, B. D. Sanborn, J. L. Brush, Asa Sterling, Arthur Strong, A. N. Plumb, W. H. H. Bliss, D. B. Wyatt, B. H. Eaton, H. G. Clark, J. C. Mosher, H. T. West, J. Max Clark.

PUMPKIN PIE DAY

LONGMONT'S PIE FESTIVAL.—Pumpkin Pie Day, which once drew great crowds to Longmont, was merged into the Boulder County Fair, universally acknowledged to have been the first among county fairs in Colorado in which the educational idea was emphasized and amusements were made secondary. This change in the idea of the county fair has been due to the influence of the county extension agents, who have succeeded in bringing farmers to the front as the dominating factors on fair boards, supplanting the old idea of race meetings with an exhibit tent for farm products merely as bait to interest rural people. How Boulder County set the pace, discontinuing Pumpkin Pie Day, for which there was little practical excuse—the pies were made from canned pumpkin—and substituted a

real fair, is best told in the language of D. W. Thomas, director of agricultural development of the Denver Chamber of Commerce, who was a resident of Longmont about 1908, when Pumpkin Pie Day was still an annual event. This is Mr. Thomas' story:

About 1908 and '10 it was the custom, and had been for several years, to hold an annual Pumpkin pie day at Longmont. The festival was held in Thompson Park. The ladies of the town cooked the pies. Days previous to the event were devoted to preparation for free entertainment of the crowds that came from the country, from surrounding towns and from Denver to attend the unique affair. I cannot definitely fix the year, but it was 1911 or '12 that I had my first experience in helping with the details on Pumpkin pie day. Anyone participating could quickly comprehend that the Pumpkin pie day business was getting stale. The good housewives were not at all enthusiastic about building the pies and that year, I recall, we had to make a dicker with a local baker to make them. The baker made the pies just as you would expect—a little crust and a smear of pumpkin. It was clearly evident that Pumpkin pie day had about run its course as a popular amusement. I reasoned that some kind of a community gathering was essential, but a party that left nothing in its wake but an unholy smear of pie crust and corruption generally, was not conducive to the development of community spirit or civic morale.

The modern idea of extension service was just beginning to take hold in Colorado and we were casting about for some way to take advantage of it. The idea of a county fair seemed logical, so the subject was broached to men in the community. Charles L. Hover and I had been reading a great deal about a county agricultural agent in De Kalb, Ills., and one or two other places, and we had been wondering if the idea could not be carried out in Boulder County. Bascom, Lauck and C. E. Smith were at work in the State as County Agents and we had watched their activity about a year. We started working up sentiment for a county agent and we found public spirit in the county just right for the work. The result was that Harry Simpson came on the job. All this happened about the time people had their fill of Pumpkin pie day.

After Simpson came we got busy on the fair idea. It unfolded gradually. The first fair was held under a tent. It was successful and it developed a public interest of which we took advantage. * * * That's about the whole story of beginnings—the end of Pumpkin pie day and the beginning of the Fair Beautiful, as it has since been called. Harry Simpson was the brains of the fair; his were the fine educational ideas as applied to agriculture and livestock. The lofty ideals were Charles L. Hover's. The business sense for handling the fair belonged to Ray H. Kiteley and A. D. Holt. I happened, through circumstances, to be hanging around and I became the Secretary of the Fair Association. We were fortunate in getting for our first Board of Directors an unusual group of broad-visioned, clear-thinking citizens. These men served unselfishly and wisely, as have their successors, and the Boulder County Fair is the result.

Other counties that have since reorganized their fairs, or established new ones, have gone to Boulder County for educational ideas. Competitive showing of farm crops has been worked out with a view, primarily, to crop improvement and not merely with premium money as the goal. The high standards established in the first years of the fair are being maintained.

Among other large fairs now emphasizing the educational idea are those of Weld, Logan, Larimer, Adams, Douglas, El Paso, Otero and Montrose counties. Logan County has made a record also at the State Fair by winning first premium repeatedly for best display of agricultural crops.

Logan County also has established an annual agricultural day observed with a barbecue. This is held at Sterling and known as the Farmers' Picnic. It is the "treat" of the town to the countryside.

GRAND JUNCTION'S PEACH DAY

FIRST OBSERVED IN 1891.—The first Peach Day was celebrated at Grand Junction September 15, 1891, in connection with the county fair, which had before that time been principally a race meeting. There were few peach orchards in the valley then.

Charles F. Caswell was largely instrumental in arranging the Peach Day program. Governor Routt, Lieutenant Governor Storey, Hon. Hosea Townsend, member of Congress, came over from Denver to attend the exercises. There were plenty of free peaches for everybody, and they were served in a stand on the fair grounds several blocks north of the city and on the present site of the Junior College.

The celebration of the day occurred about a month later than it could be held at this time, as the peaches then were of later varieties than the Elberta, which ripens about the 15th of August.

Peach Day was observed annually for several years. William Jennings Bryan was the orator of the day in 1896, during the silver agitation, and President Taft visited Grand Junction and took part in the Peach Day festivities in 1909. He was given a box of as large peaches as were ever grown—about twenty-five filling a box. Regular observance of Peach Day has been discontinued.

FORT COLLINS LAMB DAY

ONLY CELEBRATED TWICE.—Lamb Day at Fort Collins was celebrated twice, the object being to let the world know that Fort Collins was the center of one of the largest lamb-fattening districts in America. The first Lamb Day, September 29, 1909, brought between 8,000 and 10,000 people to a free barbecue, served in Oak street, near the business district. Two hundred lambs were sacrificed on the altar of publicity. Pits were dug the full length of a city block, with brick sidewalls above ground, spanned by iron grating on which the carcasses were roasted. The fires were started the evening before the feast, and as fast as the meat was cooked it was placed on another line of ovens, where charcoal kept it hot till time to carve at noon.

The butchers of the town did the carving. Merchants in other lines of business helped; students of the Agricultural College acted as waiters. Excursion trains brought thousands of people from neighboring towns. Farmers came in by horse-drawn vehicles from all distances and directions. There were few automobiles in the country at that time. Good order was maintained, the crowd being lined up single file and made to pass through a narrow opening to the serving tables, where plates were piled high with barbecued lamb. In two hours the thousands had been served, and on all

grassy spaces, including the court house lawn, on private grounds, in the streets, on sidewalks, the people ate and gratefully remembered that Fort Collins was "the world's greatest lamb-feeding center."



Tom Herron, the chef, barbecuing the lamb at the first Lamb Day celebration in Fort Collins.

It was a costly feast. The town merchants footed the bill with the help of one or two of the lamb feeders, including Senator William A. Drake. A year later it was tried again, but not with such spectacular success, and then the merchants said: "It is enough; we have let America know where to come for lamb chops."

STRAWBERRY DAY AT GLENWOOD

ANOTHER OLD FESTIVAL.—Strawberry Day at Glenwood Springs is second only to Melon Day in length of time of continuous observance. The first Strawberry Day was held June 18, 1898, and it has been regularly celebrated since on the third Saturday of each succeeding June. While the program has been varied from year to year, the main feature which brought it popularity from the start, namely, the serving of free strawberries, cream and cake, has never been omitted.

The Glenwood Post, in its announcement of the first Strawberry Day, in the issue of June 11, 1898, set forth the purposes as follows:

"The purpose of organizing Strawberry Day is to promote the growth and use of the succulent berry and the culture of Nature's most beautiful adornments—the flowers. Along with this useful work will be given a

grand opportunity for a season of pleasure, a day wherein old acquaintances may be renewed; hours when all may dance; an opportunity to see, enjoy and indulge the benefits of the health-giving waters of the famous Yampah hot springs; and last, but not least, a feast fit for the gods—strawberries, cream and cake.”

That sums up the idea, which has made Garfield County mountain strawberries famous and given wide publicity to the scenic attractions of the region along the Colorado River, of which Glenwood is the center.

COLORADO STATE FAIR

The Colorado State Fair, held annually at Pueblo, dates its origin to October 4, 1887. While the first exposition was not known as a state fair, it was more than local in extent, the organizers planning to make it a southern Colorado fair. The association had acquired 56 acres of land. A half-mile track was built and a large exposition building with three annexes was ready for the opening. “Today the fair opened. It is Pueblo’s first and a big one. The opening was a great affair and the fair itself is a big thing in every respect.” That was from a newspaper account of the opening, which further related that the entries included fine cattle, horses, sheep and hogs and that Illinois and Iowa sent “remarkably fine displays of blooded stock.”

There were approximately 2,000 exhibits. The Agricultural College at Fort Collins was represented by an exhibit in charge of Professor A. E. Blount, the comment being: “It is attracting universal admiration. Such a display of grains was probably never before made in any county. He must have a thousand varieties of cereals.”

Special mention was given an exhibit by R. C. Nisbet, “the potato king of the great San Luis Valley.” He had what was termed an astonishing collection of potatoes grown 7,500 feet above sea level, one bushel basket being loaded with potatoes weighing three pounds each.

Summing up the comment which appeared in *The Rocky Mountain News* from a Pueblo correspondent, it was stated that the fair “is an array of forceful facts, demonstrating that the apparently barren plain and sagebrush wastes of southern Colorado are capable of supporting, in the golden future, now but a little way ahead, a vast population.” The State Fair has been a factor in the development of agriculture in all its phases. While northern Colorado has not always been well represented by exhibits or attendance, other sections of the state have taken advantage of the opportunity given annually at Pueblo to show their best in field crops, fruit and livestock. Of late years, also, the division given over to competition between counties has proved a popular feature, resulting in more general participa-

tion. The State Fair has always had a strong horticultural show, displays having come from the upper and lower Arkansas Valley and from the Western Slope and southwestern fruit-raising districts.

The Agricultural College has done its share in building up the educational side of the fair, by furnishing the judges for many departments and also aiding in the work of superintendence in several divisions.

An annual feature of the fair, which has done much to further agricultural education among the young people of the rural districts is the Boys' and Girls' Club Encampment. Details of this are given on the pages devoted to club work.

The fair receives some legislative aid biennially, and while the gate receipts do not always meet expenses, the benefits should be measured in results to agricultural development rather than on a dollars-and-cents basis. The State Fair Commission, in 1926, was composed of John H. Thatcher, Pueblo, president; Senator John J. Tobin, Montrose, secretary, and G. W. Huntley, Flagler.

HOW FARM STATISTICS ARE GATHERED

DEPARTMENT OF IMMIGRATION.—The gathering and compilation of agricultural statistics is the duty of the State Department of Immigration. The department was established in 1909, for the purpose, as phrased in the creating act—S. L. 1909, page 163—“of properly advertising the resources and attractions of the State of Colorado among the people of other states and nations, so that by immigration and investments the development of the state may be stimulated and its population increased.”

By act of the Legislature in 1919 (S. L. 1919, page 632) assessors were specifically required to obtain, at the time of taking the annual assessment of property, a complete statement of farm operations on schedules to be furnished by the department, and by the same act other public officials and private individuals were required to provide information of a proper character upon request of the department.

In 1919 the department, under authorization of the statute, entered into an agreement with the Secretary of Agriculture of the United States for the establishment of a co-operative crop-reporting service, to consist of the Immigration Department and the Bureau of Crop Estimates of the federal department. Under the act the schedules used by county assessors are passed upon jointly by the Immigration Department, the State Agricultural College and the Bureau of Crop Estimates—the latter being known officially as the Division of Crop and Livestock Estimates of the Bureau of Agricultural Economics of the Department of Agriculture.

ASSESSORS TAKE CROP DATA.—The method used in preparing and publishing crop data is as follows: The county assessors carry with them printed schedules prepared in book form, in which they report the acreage, tenure and other matter required by the schedule, together with the acreage planted to each crop, segregated into irrigated and non-irrigated areas. In this manner information is obtained concerning the operations on about 56,000 farms. This is sent direct to the department at Denver, where it is tabulated by counties and prepared for further consideration.

After the close of the harvest season the data secured during the earlier season by the county assessors are considered jointly by this department and the Bureau of Crop and Livestock Estimates. Allowances are made for incompleteness of returns and for crop changes due to climatic or other conditions occurring after the schedules were taken. The acreages, as finally agreed upon by the co-operative service, are forwarded to the bureau in Washington for final approval, and as approved are published with joint credit, the published figures including acreages, and total yields fixed by the bureau, which has taken during the growing and harvest seasons a large number of reports on crop condition and probable and actual yields.

That, in brief, is the manner in which the agricultural statistical information is secured and published. Livestock data come largely from the bureau's investigations, as experience has shown that it is impossible to secure through the assessors any better returns on the numbers of livestock than the assessors secure for taxation purposes.

ISSUE THE CROP REPORTER.—Agricultural publications of the department include the Co-operative Crop Reporter, published monthly, with an annual summary by this department and the federal bureau. This publicity makes it possible for the farmer to avail himself of the same information that the buyers of agricultural products have had for many years, and with this information he can judge more accurately of the probable returns of any given crop in a definite locality. The important feature, however, seems to be the fact that agricultural statistics of this character reflect the rural development of a state and provide the individual farmer with a means of defense against the evil of overproduction. The experience of years shows the reaction of agriculture to any given economic or climatic condition, and armed with that information a farmer can well avoid the error of joining a general movement which promises a market glut for any particular crop.

THE COLORADO YEAR BOOK.—In addition to the agricultural work, which was taken over with the belief that reliable, accurate information concerning farming progress is essential to any sound program of development, the department collects and publishes a wide variety of statistical in-

formation concerning other phases of industry, including manufacturing, mining and oil, etc., besides a quantity of information of general interest concerning the state. This material is used in the Colorado Year Book, public land publications, booklets dealing in detail with groups of counties and similar publications. When funds are available, the department carries on advertising campaigns to induce settlement.

The department consistently avoids booming or boosting tactics and sticks to conservative development along lines which promise permanent, substantial results, and which are based upon facts rather than fancy.

The officers in 1926 were: Edward D. Foster, Commissioner of Immigration; Tolbert R. Ingram, Deputy. The gathering of crop statistics under the co-operative agreement is in charge of W. W. Putnam, Agricultural Statistician, a federal officer. The State Board of Immigration, which has general supervisory authority, is composed of the Governor, ex-officio; Joseph L. Pickens of Denver, L. Wirt Markham of Lamar and Arthur H. King of Sterling.

The Year Book, official publication of the Immigration Department, is compiled and edited by Tolbert R. Ingram and is now as essential to manufactures and mining as to agriculture. It contains as permanent features a general description of the state, its geography, climatology, analysis of population, land classification, drainage and water supply, national forest and national parks information, transportation facilities and brief land history, besides the annually changing mass of crop and livestock statistics. Colorado's rank among the states agriculturally and industrially, is presented in the 1926 Year Book in a tabulation from which the following is obtained.

COLORADO'S CROP RANK.—Colorado ranked first of all states in value of beet sugar manufactured in 1923, with a total value of sugar output of \$30,165,810, which was over 25 per cent of the value of all beet sugar made in the United States. This rank is being maintained and the percentage is increasing at present. First rank is also maintained, therefore, in beet acreage and production, Colorado's percentage of total United States beet production in 1925 being 20.90 per cent. In 1926 this percentage was showing a prospect of a considerable increase, as Colorado's beet crop was the largest in the history of the state, the farm value of beets being estimated at \$25,000,000, when the harvest started.

In canteloupe production Colorado, in 1925, ranked second in the United States with a production of 1,604,000 crates, 11.45 per cent of the total production.

Colorado ranked second also in head lettuce production with 1,396,000 crates, 8.63 per cent of the total production of lettuce in the United States.

In dry beans Colorado held third place in production for 1925, with 2,240,000 bushels, or 11.73 per cent of the production of all states.

In cauliflower production for 1925 Colorado ranked fourth with 160,000 crates, which was 4.63 per cent of production for the entire United States.

In production of grain sorghums Colorado's rank is fifth, with 2,322,000 bushels in 1925, or 3.27 per cent of the nation's total on kafir and milo-maize.

In celery production Colorado holds sixth place with 336,000 crates in 1925, which is 4.97 per cent of the total for the United States.

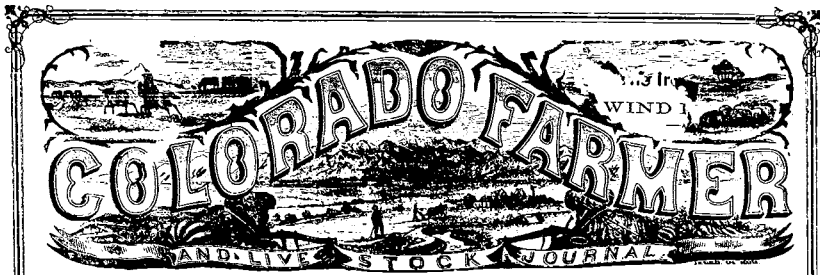
In potatoes Colorado ranked seventh in 1925, with 14,190,000 bushels, or 4.38 per cent of the nation's total.

On such staple crops as wheat, corn and oats the state ranks low in quantity production. In production per acre the rank is high where these grains are grown under irrigation, but low where grown without artificial watering, which pulls down the general averages. However, on some of the special crops enumerated above on which high rank is held in quantity production, the average per acre also is high, due to the fact that the crops are irrigated. The average production per acre is no higher than in other Western states where irrigation is practiced. The Department of Agriculture Year Book for 1925 and the Colorado State Year Book for 1926 are reliable sources of information on these points.

MARKET NEWS SERVICE

The dissemination of market news, which has to do with the immediate condition of crops and livestock, and the demand and supply, is an activity altogether separate from the statistical work above described. This service is in charge of the Bureau of Agricultural Economics of the U. S. Department of Agriculture, with the Extension Service of Colorado Agricultural College co-operating. Market news is disseminated by letter, telephone, telegraph and radio, from two main centers in Denver and during the heavy shipping season also from Grand Junction and Greeley. The Denver centers are in the Capitol Building and at the Denver Union Stock Yards.

This is part of a national service established by the U. S. Department of Agriculture in co-operation with the agricultural colleges of various states. When first inaugurated in 1917 the service included educational and organization work in marketing, but later that part was left to the individual states, to carry on through the Extension Service of the Agricultural Colleges, while the federal government now confines itself to collecting and disseminating immediate news of the markets. This market news service has superseded private market news bureaus and it has been of tremendous



DEVOTED EXCLUSIVELY TO THE AGRICULTURAL AND STOCK INTERESTS OF THE STATE OF COLORADO.

500 PER ANNUM.

DENVER, COLORADO, MARCH 31, 1887.

VOL. XXIX, NO. 13

THE COLORADO FARMER.

State Horticultural, C. A. Farnes, P. O. of Hiram, Colorado his office is situated at Fort Lytle.

The state horticulturalist of Illinois has issued a valuable treatise on the above subject. The substance that about one-third their application is destroyed by the codling moth. He has experimented with several varieties and Paris green. The latter mixture was three-fourths of an ounce weight of a strength to contain 15 per cent of caustic soda and 10 per cent of a half gallon of water. The solution was made by boiling one ounce of soda in a quart of water and adding it to twenty gallons of cold water. The baits were then by hand from pump to a fine mist-like spray every week. The leaves became dry and the codling moth was exterminated. The number being 20,000. He claims that 4,000 to 50 per cent of the fruit was saved. He compared the results of spraying more than once, a single spraying saved 75 per cent, twice 75 and three 75 to 78. His work was conducted in May and the early part of June. As this month is nearly over in the bloom of the apple, the proper time to do this is done it reaches the surface of the apple leaves, the early part of the season. The fruit can be used freely pointed when the apple is full grown and ready to be used. It is highly objectionable to use these solutions after the apple has begun to hang downward. The standard of a large central pit which holds the poison as it is used, and is used every week when the fruit is quite young.

AN EXCITING STORY.

Parsons, Adams & Co. have been established in Denver, Colo., March 30, 1887.

Nothing on earth or two years ago, your most devoted to regard to find out killed in Colorado. I will give you an experience of 80 days ago. March 10, being five days before the storm. It was at Fort Rock Ranch, in Jefferson Co., then 230 p. m., that we were suddenly assailed from our innocent slumbers by a most hideous bark, yell and screech, emanating from our three fatigued cattle and, at the same moment, could be distinguished from the clouds falling pellets, yet rapidly upon the ground. The wind drove to the wide-spread door could be seen the darkness, the face of the sea in the "light beams" and beyond, shortly after 1, perceived upon the top of the mountain, surrounded by a single redoubtable, surrounded by the three elements, and the wind. It is generally supposed that the storm, then, with a sudden hood, the storm struck us as if it were a ball. With a vast deafening scream, that manifested itself by a bright air after that, Mrs. J. Manning the door, and grabbed the horse, and soon on her way. She was suddenly checked in her wild career, and fell with her head on top of him, against the door. If it had not been for the fact that she was on her feet, the light would have certainly been received by the house. It is this time Mrs. J. Manning the door.

and myself were out on our feet and to the south. A moment more and we were in the yard and a scorching feeling over developed the heat, in our astonishment, that the heat was fairly on the nose of the tree and a half story front of the chimney. When upon the artillery firing of once more. We returned to the house and when we opened the front door the actual world immediately fell upon us. The other side of the door, Mr. J. brought his Ballard rifle into the room and after three shots and a few minutes directed shots from the kitchen. We succeeded in finishing the creature, whereupon he turned his head and fell like a stone which was broken. It is a great pleasure to see that these animals were testing the "lighting" solution.

and Parsons & Co. (The Colorado F. Co.) is applying to incorporate the "Great State Change Corporation" under the name of "The Colorado F. Co." in the State of Pennsylvania. The corporation is to be organized in the month of May and will have its office in Denver, Colorado. The corporation is to be organized in the month of May and will have its office in Denver, Colorado. The corporation is to be organized in the month of May and will have its office in Denver, Colorado.

THE WISCONSIN FARMER.

Henry Lee, in manufacturing his new hay rack for the public which has been upon your most indispensible machine in the state of Wisconsin. The simplicity of construction, and its unquestionable durability, secure all other hay presses ever manufactured. It is built so that when used, it lies flat on the ground, thus avoiding the necessity of picking hay on to the press and dodge away with one's workmen, and ties at the lowest with the greatest facility. It is adapted to being hay, straw, wool, cotton, hair or any other material usually put in bales. The baling chamber of usual shape is in the front and is made of the very best timber, sufficiently strong to bale any desired weight of hay, with a large opening for chaffing. It is a wonder of simplicity with the greatest possible power. The frame making a continuous direct motion to press the hay every revolution. Thus avoiding the loss of time in turning or reversing is usually the case with other presses, and latter makes our rapid press manufactured, making a smooth, square face of any desired length or weight, using either cord or wire for tying. One of the greatest advantages is that the throwing can be done from one side, thus avoiding walking around the press, as is usually the case with other presses. The weight of the machine is 1,200 lbs. and it is very easy to move and also requires no soaking down or maddening to set up, and is always ready for operation. From the extensive use of hay presses, the following facts are given: One good frame of this press is that it makes good work light, cheap, weather or abate and becomes loose in hot weather. It has an adjustable head block it is impossible to shake it, therefore, it is a most desirable machine. The greatest of all importance is that it is completely cheap and makes the process of early spring farming, enabling the farmer to get his own hay, the cost of having it done at an average price, or selling it at a standard price, owing to the hay, not having been baled.

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LEGAL NOTICE AND QUERIES.

We are asked to convey the following: A man who has been in the habit of using a certain brand of hay rack for the public which has been upon your most indispensible machine in the state of Wisconsin. The simplicity of construction, and its unquestionable durability, secure all other hay presses ever manufactured. It is built so that when used, it lies flat on the ground, thus avoiding the necessity of picking hay on to the press and dodge away with one's workmen, and ties at the lowest with the greatest facility. It is adapted to being hay, straw, wool, cotton, hair or any other material usually put in bales. The baling chamber of usual shape is in the front and is made of the very best timber, sufficiently strong to bale any desired weight of hay, with a large opening for chaffing. It is a wonder of simplicity with the greatest possible power. The frame making a continuous direct motion to press the hay every revolution. Thus avoiding the loss of time in turning or reversing is usually the case with other presses, and latter makes our rapid press manufactured, making a smooth, square face of any desired length or weight, using either cord or wire for tying. One of the greatest advantages is that the throwing can be done from one side, thus avoiding walking around the press, as is usually the case with other presses. The weight of the machine is 1,200 lbs. and it is very easy to move and also requires no soaking down or maddening to set up, and is always ready for operation. From the extensive use of hay presses, the following facts are given: One good frame of this press is that it makes good work light, cheap, weather or abate and becomes loose in hot weather. It has an adjustable head block it is impossible to shake it, therefore, it is a most desirable machine. The greatest of all importance is that it is completely cheap and makes the process of early spring farming, enabling the farmer to get his own hay, the cost of having it done at an average price, or selling it at a standard price, owing to the hay, not having been baled.

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DAIRY NOTES.

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THE COLORADO FARMER.

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Facsimile page of The Colorado Farmer, the pioneer agricultural journal.

value to producers, because of its accuracy in reflecting market conditions, its speed in disseminating the news and the unbiased character of the service.

The service is well organized in Colorado and it is of great importance to the farmers, because the state is on an export basis in production, prices of many Colorado commodities being subject to supply and demand at distant centers.

Radio has proved its value in market news dissemination in Colorado since 1923 and it is now an important arm of the service, both for livestock and for potatoes and fruits.

INFLUENCE OF THE FARM PRESS ON AGRICULTURE

NEWSPAPERS KEPT TAB.—During the first fifteen years of development of the Territory of Colorado the farming industry had no official organ, though the daily and weekly newspapers gave much space to agriculture. While a new discovery of gold or silver was considered "big news" of the day, there was interest, nevertheless, in the less spectacular development of farming and stock raising, hence agricultural news received equal weight with the news of commerce. Analysis of the news columns of the pioneer papers shows balanced judgment in the editorial control of the papers. Crime, war and disaster, then as now, received the display headlines and created most comment, but the more prosaic affairs of the new commonwealth that made for growth in wealth and contentment were not neglected.

In the first years the everyday life of the people was even more closely reflected in the press than later, because the papers were dependent upon local happenings for most of their stories. There was no telegraph service to Denver until the fall of 1863, though dispatches were carried by pony express from Julesburg, beginning late in 1861. Another reason for emphasis on what, in a newspaper sense are now considered ordinary happenings, was the newness of the country, the lack of knowledge of what the ground would produce, or what commercial ventures would yield. And these things then were news, for it was out of the ordinary when apples sold at \$1.25 each, or flour at \$40 a hundred, or when some astonished gardener found a potato weighing three pounds in the sandy bottom on which he was growing vegetables. It was hardly necessary for the newspapers to make inquiry about such happenings; usually the discoverer of something new or big produced by the soil brought a specimen to the editorial office, and gave details which were interesting to read at the time and which have also been of great help in the preparation of this book.

While this attention to agriculture was characteristic of *The Rocky Mountain News*, whose first editor, William N. Byers, was also a farmer, rival papers at Denver followed suit. Even at Golden, the very gateway to the mines, the early newspapers did their share in recording agricultural progress.

The *Canon Times* at Canon City from 1860, *The Colorado Chieftain* at Pueblo, from 1868, also devoted much space to discussion of farming opportunities and possibilities. This discussion was principally on the lines of crop growing and not so much about cattle raising. The livestock industry seems to have grown up without much newspaper attention, until it reached a stage where its interests became dominant in the commercial life of the territory. This was after 1870.

FIRST AGRICULTURAL REPORTER.—The most remarkable and complete newspaper survey of early agriculture in Colorado is from the pen of William R. Thomas, who was on the staff of *The Rocky Mountain News* as a reporter and an editorial writer. In 1868 Thomas made a tour on horseback up and down the Platte Valley, northward to the Cache la Poudre and southward from Denver up Cherry Creek, over the Arkansas Divide and down the *Fontaine qui Bouille*. The articles written on this tour describe farming in detail. A summary of them is given in another chapter of this book.

While the newspapers thus furnished the literature of agriculture during the first 15 years of settlement, as a division of their daily or weekly attention to the news of the day, the *Greeley Tribune*, founded at the time of establishment of the Union Colony in 1870, was the first newspaper that could be called a rural weekly. Its purpose was to serve as a complete newspaper for the new community, but that community was so thoroughly rural that the columns of *The Tribune* naturally reflected the character of the development. Farming was the chief business at Greeley. There were no mines nearby and cattle raising, on the unfenced prairies, looked to the colonists like the business of nomads, for which they had neither experience nor inclination. A farm was a place where plows broke up the ground, harrows smoothed it down for seeding, and men planted wheat and corn and potatoes. In that respect the business was old to most of the colonists, but here was the new factor of artificial watering, essential to successful crop production, hence irrigation had to be discussed in all its phases. What more natural then that the editor, Nathan C. Meeker, a rural-minded man and former agricultural editor of *The New York Tribune*, should make agriculture his editorial hobby? *The Greeley Tribune* thus became Colorado's first rural weekly, though not exclusively an agricultural paper.

THE COLORADO FARMER.—The first agricultural journal was The Colorado Farmer, founded at Evans in 1872 by Feebles and Phillips.

While the files of the first years are missing, there is, nevertheless, information regarding the policies governing the journal to be found in an advertisement which appeared in the Greeley Tribune, January 15, 1873, immediately following establishment of The Farmer. This advertisement contained the following information: "The Farmer is devoted to all the interests of the farm, viz.: Agriculture, horticulture, stock, the dairy, poultry, etc., and to the development of the unlimited resources of Colorado; also to immigration facts and figures, which may be relied upon as being the inducements offered. Send one dollar and get it for 1873." The Farmer started as a sixteen-page weekly and its circulation a year after establishment, was given as 2,000, while advertising rates were "as low as any first-class paper in the West."

Like the industry for which it was the first spokesman, The Colorado Farmer had a checkered career. Changes in ownership and editorial management were frequent. Its publication office was changed to Denver in April, 1874, where it remained through successive ownerships until merged with Field and Farm, April 4, 1896. From 1889 to 1891 D. W. Working was one of the editors of The Colorado Farmer. For years its identity was lost, to be revived in 1911 by C. H. Hinman and associates, who published a paper at Fort Morgan for four years which they called The Colorado Farmer. In 1914 this new Colorado Farmer was merged with The Western Farm Life.

FIELD AND FARM.—The farm journal that enjoyed the longest period of continuous existence was Field and Farm, founded January 2, 1886, by L. W. Cutler and Lucius M. Wilcox and published until 1920, when the remaining partner, Mr. Wilcox, then editor and publisher, sold out to Senator Arthur Capper of Kansas. It was planned to make Field and Farm a part of the Capper publications and several numbers were issued as The Colorado Farmer. However, the financial depression that hit the agricultural, as well as other industries in the fall of 1920, caused the new owner to close up the Denver office and discontinue publication of the journal that had been the successor to Field and Farm for such a brief period.

Field and Farm, under the ownership of Cutler and Wilcox, took the place of The Colorado Farmer in aggressive championship of the agricultural industry. The journal began its work with a modest though pointed salutatory, which set forth its policy of utilitarianism in these words:

In presenting this, our first number of the Field and Farm to an intelligent reading public, we do so in the belief that if we merit success, we shall succeed. There is no longer friendship in business. The people buy what they want and usually pay for

what they buy. A newspaper is not unlike other commodities in any essential particular. It is weighed in much the same balance as the other luxuries and necessities of life. It must be what the people want, otherwise the people will not buy. Too many men are making newspapers who should be making shoe pegs. We expect to make this journal a necessity in the household of the farmer and the stock grower.—*Field and Farm*, Vol. 1, No. 1, Jan. 2, 1886.

It was quite evident, from this start that the publishers of this farm journal knew their business. *Field and Farm* quickly assumed leadership in movements for the improvement of agriculture and held that position through nearly a third of a century of usefulness and progress. It is easy to trace the history of agriculture in Colorado from the middle eighties when the range industry was at its height, to the World War period, by reading the files of this journal, whose last editor, Lucius M. Wilcox, is still active in Denver, though now (1926) in another line of work.

COLORADO LIVE STOCK RECORD.—During the eighties there was published in Denver *The Colorado Live Stock Record*, in the interest of the range industry. It lasted but a few years, as *Field and Farm* and *The Colorado Farmer* were then publishing both the news of general farming and of the range industry, an accomplishment that kept the editors busy in an attempt to harmonize sharply conflicting interests and hold a reader list among both classes. *The Live Stock Record*, at first a weekly, finally was merged with what is now *The Denver Daily Record-Stockman*, which traces its foundation back to 1889.

DAILY RECORD-STOCKMAN.—*The Denver Daily Record-Stockman*, founded in Denver in 1889 as the *Denver Stockman*, bears the important distinction of being the only livestock and agricultural journal of daily circulation west of Wichita, Kansas. It goes from Denver each week day afternoon with a budget of news for the stockmen and farmers and bears, naturally, an important relationship to the state's advancement in all forms of agriculture.

The Denver Stockman was combined in 1900 with the *Daily Live Stock Record*. The two papers, respectively, were originally owned and conducted by Dr. W. H. Sharpley of Denver and D. K. Holly, now deceased. During the years 1900 to 1910 the paper was conducted under a partnership arrangement between Fred P. Johnson and Mr. Holly. Mr. Johnson also served as secretary of the National Western Stock Show from its inception in 1906 until his death in 1923. In 1910 Mr. Holly disposed of his interest in the *Daily Record-Stockman* to the National Packing Company, subsequently acquired by Armour and Swift in Chicago. This interest in 1919 was acquired by Arthur C. Johnson, present editor of the paper. Assistants in conducting the paper are Mahlon B. Johnson, son of the late Fred P. Johnson, and Willis N. Fulton, the paper's manager.

Under the Colorado statutes authorizing the selection of an official livestock newspaper, the Denver Daily Record-Stockman is named by the Colorado Board of Stock Inspection Commissioners in that capacity and is the recognized official medium for carrying the edicts of the board, brand issuances, estray and impoundment notices, etc.

The Denver Daily Record-Stockman is the principal news medium of the daily market at the Denver Union Stock Yards and carries also United Press dispatches and general comment and news of interest to breeders, farmers and promotive interests generally in the line of agriculture. Its influence towards the upbuilding of affairs in this quarter, therefore, is very great and much of the progress of agriculture and livestock in Colorado can be traced to such support in publicity as the paper has been able to give.

RANCH AND RANGE.—For a period of sixteen years Ranch and Range did its part in the development of agriculture, under the ownership and management of H. S. Groves. This was issued at Denver as a monthly and its purpose was two-fold, being devoted to the settlement and development of Colorado lands, as well as to the aid of established farmers in presenting the usual selection of informational items on agriculture.

THE WESTERN FARM LIFE.—The first issue of The Western Farm Life, a semi-monthly, was published August 15, 1914. The names of the publications which were absorbed by The Western Farm Life at that time were the Farmers Life and Fruit Journal, Ranch and Range, Trans-Missouri Farmer and Ranchman, and The Colorado Farmer.

The editorial policy of The Western Farm Life is to deal with the specific problems that confront irrigation, high altitude and plains farmers. The purpose is the development of dairying, hog raising, poultry, as well as specialized crops, which are particularly adapted to conditions in Colorado, Wyoming, Utah and adjacent sections. The Western Farm Life endeavors to lead its readers in sound thinking and acting on questions of managing, marketing, finance, transportation, agricultural legislation and kindred economic subjects; to present ways and means of making life on the farm easier and happier.

Those interested in the organization of the Farm Life Publishing Company were Ex-Governor E. M. Ammons, Frederick P. Johnson, H. S. Groves and W. S. Edmiston. Since the organization of the publishing company, Mr. Edmiston has been the general manager, and as such the by-laws vest in him the authority to govern both the editorial and business policies of the publication. H. S. Groves was managing editor from August 15, 1914, to February 1, 1917. Ex-Governor E. M. Ammons served as president of the corporation from August 15, 1914, until his death in the spring of 1925. Alvin T. Steinel served as managing editor from February 1,

1917, to February 1, 1922. Geo. C. Wheeler has been serving as managing editor from February 1, 1922.

The *Western Farm Life*, through its managing editor, Mr. Geo. C. Wheeler, inaugurated a *Farmers' Question Box* in the fall of 1925 by an arrangement with the General Electric Company over its broadcasting station, KOA, Denver. This magazine has the distinction of being the first farm journal in America to take up extensively the use of radio in supplying special information to farmers.

THE GREAT DIVIDE.—While not exclusively agricultural in character, *The Great Divide* is a rural weekly, circulating, according to its own announcement, mainly in “the thirteen original Great Divide states, which are the treasure vaults of America—Colorado, Wyoming, Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, New Mexico, Arizona, Utah and Idaho.” *The Great Divide* was founded in 1889 by H. H. Tammen. Its announced purpose is “to cover the farm news of the Rocky Mountain States,” though it carries also many columns of general news and feature articles. The publishers are Post Publishing Company, Denver, and the editor-in-chief is Volney T. Hoggatt.

THE FARM NEWS.—Colorado Springs Farm News is an agricultural weekly covering the several counties which are considered trade territory of Colorado Springs. This weekly is exclusively rural in character, devoting its columns to news and information applying to the farm and the farm household. John N. Green is editor and manager and Louis W. Cunningham, associate editor.

WHAT THE MOFFAT TUNNEL MEANS TO AGRICULTURE

Colorado's semi-centennial year saw the Moffat Tunnel nearing completion. This gigantic railroad bore will bring an agricultural empire into close touch with markets and result in the development of territory that has been almost dormant because of difficulties encountered by the Denver & Salt Lake Railway in crossing the Continental Divide in winter at a point 65 miles northwest of Denver, where the railway reaches an elevation of 11,660 feet above sea level, the highest point touched by any standard gauge railway in America. Because of the importance of the tunnel to the future agricultural development of Northwest Colorado a brief history of the project is in order.

While for many years David H. Moffat had made attempts to interest Eastern capital in building a tunnel under James Peak, no definite action of a public nature to construct such a tunnel was taken until 1913. At that time the City of Denver created a tunnel commission and authorized a bond

issue to build the tunnel. This action was, however, declared invalid by the State Supreme Court in 1914.

TUNNEL DISTRICT CREATED.—It was not until 1922 that successful legislation was enacted and a definite plan organized. At the special session of the General Assembly in April, 1922, a bill was introduced, creating a Moffat Tunnel district, based upon the principles governing city improvement districts. The plan was drafted by City Attorney James A. Marsh of Denver. The bill was passed by the legislature on April 28 and was signed by Governor Oliver H. Shoup on May 12. Five tunnel commissioners were appointed: W. P. Robinson, W. N. W. Blayney and Charles MacAllister Willcox of Denver, Charles H. Leckenby of Steamboat Springs and Charles Wheeler of Yampa, Colorado. W. P. Robinson was elected president, Charles H. Leckenby secretary. The measure was attacked through injunction proceedings, the District Court denying an injunction. The case went to the State Supreme Court, where the constitutionality of the Moffat Tunnel District was upheld, and that action was affirmed by the United States Supreme Court June 11, 1923.

The tunnel district is composed of Denver, Grand, Routt and Moffat and parts of Adams, Jefferson, Boulder, Gilpin and Eagle counties. The first bond issue amounted to \$6,720,000. Subsequent issues finally brought the total up to \$12,700,000 in 1926. The tunnel is to be owned perpetually by the Moffat Tunnel Improvement District and no monopoly for its use is permitted. It may be leased for no term longer than 99 years for transmission of power, telephone and telegraph lines, transportation of water, railroad and any other purpose to which it may be adapted.

The Tunnel Board is authorized to construct and maintain power plants for the electrification of the tunnel and to exercise the power of eminent domain, when such power is necessary. If the revenues from the tunnel are not sufficient to pay the interest, provide for the retirement of the bonds at maturity and pay the expenses of maintenance, the board is authorized to assess the private property of the district. The wording of the Tunnel Improvement District measure makes it possible for the commissioners to lease the tunnel to any railroad company which may desire to use it.

The Continental Divide reaches its highest continuous elevation in Colorado, and to cross the state from east to west it was necessary for the railroads to adopt either circuitous routes or difficult grades, on which the roads were subject to snow blockades during the winter months, which crippled traffic at frequent intervals.

OVER SIX MILES LONG.—The tunnel will be 6.09 miles in length and will save 23 miles of line and 2,406 feet in elevation at the top of the Divide. The elevation of the eastern portal, three miles from Tolland, is

9,198 feet, far enough below timber line to insure safety from devastating snow-drifts. The western portal has an elevation of 9,085 feet. It will eliminate trackage "over the top" now protected by two miles of snowsheds. Corona, the station at the summit, is under sheds surrounded by eternal snows.

The Moffat Tunnel will make accessible a vast area of undeveloped land, with marvelous agricultural and mineral prospects. The Denver & Salt Lake Railroad now ends at Craig in Moffat County, though projected to reach the Utah capital and open the Uintah Basin. Completion of the tunnel is expected to insure extension of the railroad to its western goal. Also it will then be feasible to build what is known as the Dotsero cut-off of 41 miles, connecting the rails of the Denver & Salt Lake and the Denver & Rio Grande Western, enabling the routing of trains of the latter road, so as to avoid a long journey paralleling the mountain ranges to and through the Arkansas River gap west of Pueblo. The saving in distance via the Moffat Tunnel and rails will thus be 173 miles, as between Denver and Grand Junction.

AN UNDEVELOPED EMPIRE.—Testimony given by Dr. Charles A. Lory, president of Colorado Agricultural College, at an Interstate Commerce Commission hearing in Denver in April, 1923, on the railroad consolidation question, indicated that Northwestern Colorado and the adjoining region in Utah comprised the largest undeveloped agricultural area in the United States. It includes in Colorado the counties of Grand, Routt, Moffat and Rio Blanco, is well watered and has large areas of land adaptable to irrigation, also much dry farming land and vast areas of grazing land in the upper regions. All of this is but partly developed, because of lack of transportation. During the last three years oil discoveries and development of a considerable field in the vicinity of Craig, have given impetus to investment and made doubly sure of prosperity that will come with completion of the Moffat Tunnel. For agriculture it will mean an outlet for surplus products and larger markets at home, with the building of towns, the coming of new industries and the development of oil, coal and other mineral resources.

RAILROAD AGRICULTURAL WORK

PUREBRED SIRE CAMPAIGN.—An unusually successful educational campaign was carried on in the fall of 1923 by the Agricultural Department of the Colorado & Southern and Burlington railways in Colorado. This was known as the Purebred Sires train, the tour of which attracted attention nationally, among those interested in methods of propoganda for better agriculture, or agricultural extension, as it is called. This campaign

had for its object the replacement of scrub sires by purebred registered sires, on fifty-nine farms. Scrub bulls and boars that had been in use on these farms were turned over to the railroad company by the farmers for purebreds, without further cost, but under the definite promise of a signed contract to use the purebred animals in building up a herd. Furthermore, the recipients agreed to maintain such herds as demonstration herds; that is, to give their neighbors access to them and opportunity for watching their development. The scrub bulls and boars were sold for slaughter at the end of the tour.

Breeders donated the registered animals; the railroad company furnished a demonstration and exhibit train; the Extension Service of the Agricultural College provided speakers versed in animal husbandry to make the exchanges and give to the assembled onlookers reasons why the scrubs were being eliminated and good sires of recognized blood and breeding substituted for them. One year later there was a visit to the farms which had benefited by the exchange, and data were obtained on progress of the herds. This information was tabulated and sent out to the regions covered originally by the demonstration train, as a second lesson in the value of purebred sires over those of mongrel breeding. So completely successful was this campaign that other railroads, backed similarly by improvement organizations and agricultural colleges, adopted the method. Besides the breeders and the Agricultural College, this campaign also had active aid from the Agricultural and Livestock Bureau of the Denver Chamber of Commerce and from the Denver livestock interests.

H. L. Ford, agricultural agent of the Colorado & Southern, was in charge of the Purebred Sires train. Associated with Mr. Ford as assistant agriculturist, is Fred L. Taylor.

The agricultural department of the Colorado & Southern was organized May 16, 1916, and the first agriculturist was Otto H. Leibers. He resigned May 25, 1919, and Earle G. Reed was appointed to succeed him. Reed had been a county agent in Wyoming. On Reed's resignation in July, 1922, to take up similar work for the New York Central Railway, H. L. Ford, who had been assistant agriculturist for two years, became agriculturist.

Dairy development through the importation of high grade and purebred milk stock was the principal work of Mr. Leibers. Mr. Reed also brought in good dairy stock. Reed was active, too, in the development of seed potato production, bringing in certified seed for planting in certain favorable seed growing localities along the Colorado & Southern and then aiding in the development of a southern market for the desirable Colorado-grown seed potatoes.

The present agriculturist has been active in getting farmers on the plains interested in sweet clover, to supply the need for a leguminous hay and pasture crop, has aided in smut prevention campaigns in the winter wheat belt, and aided in the campaigns of the Great Western Sugar Company for "Another Ton per Acre."

OLIN'S WORK ON THE D. & R. G. W.—Agricultural extension work for the Denver & Rio Grande Western Railway in Colorado, New Mexico and Utah, is done by W. H. Olin, who organized the work, beginning his service with the company April 1, 1914, and carrying it on actively ever since. While Mr. Olin's title is that of supervisor of agriculture, he is also the company's colonization agent and looks after industrial locations as well. It is only by close co-operation with other development agencies that he has been able to make his work effective. He has found the county agents especially good co-operators, having placed himself at the service of these men and, in turn, aiding them in spreading the gospel of better agriculture.

In a report made by Mr. Olin to his company outlining methods followed in his agricultural extension work, he said:

Through and with the help of these County Agents and leading stock associations, purebred sires are now in practically all our range cattle territory; many purebred dairy herds have come into our trade territory and many dairies now use only purebred dairy sires to breed their grade dairy cows.

Through County Agents and with co-operation of milling wheat interests, superior and standard types of milling wheat, both winter and spring, have been standardized within commercial producing districts. Superior types of barley and oats have been encouraged, so seed grain in commercial quantities can be obtained by seedsmen and the general trade. Seed plots of corn have been encouraged, so that the commercial growing of corn has been made an added crop in several districts. This encourages feeding operations and sends over our rails a finished product to market.

The growing of high altitude vegetables of a superior quality has been encouraged in regions where same are well adapted because of soil and climatic environment.

With the help of the Extension Workers and the Horticultural Department of the Agricultural College the types of potatoes grown have been reduced to the two or three types which do best in a commercial district and for which there is market demand.

Special campaigns by train and otherwise supervised by Mr. Olin in recent years, have been the Purebred Sires exchange in the San Luis Valley, through which ten dairy herds have been established on as many farms, in co-operation with the San Luis Valley Dairy Association, the Agricultural College and other agencies for agricultural improvement; an apple grading and marketing campaign in the Western Slope fruit districts and Head Lettuce Special trains. Mr. Olin has been active in the development of registered seed, being one of the principal backers of the State Pure Seed Show at Colorado Springs, offering trophy cups on behalf of his company for registered seed and fostering in other ways the improvement of crop yields in D. & R. G. W. territory through the use of registered seeds.

The agricultural department of the D. & R. G. W. has been particularly active in furthering the head lettuce industry and the growing of other high altitude vegetables. Much educational work has been done in the growing territory, and the growers have been directly and effectively aided in the development of markets. Mr. Olin has assisted Dr. E. P. Sandsten, horticulturist of the Agricultural College, in establishing and making an annual success of Farmers Day at Avon, where the state's experimental farm for high altitude work is located.

FIRST DEMONSTRATION TRAIN.—The Denver & Rio Grande Western was the pioneer in the demonstration train idea in the West. The Potato Special run over its lines in 1908 under supervision of Henry M. Cottrell, then Director of Farmers' Institutes for the Agricultural College, was the first train of its kind to be run on any railroad in the intermountain country. The company had no agriculturist at that time, but through Frank Wadleigh, now passenger traffic manager, its equipment and service were placed at the disposal of the Agricultural College for the purpose of reaching potato growers with information that would enable them to market their potatoes to better advantage and to improve quality by better seed and better methods of production. The train was run during April and stops were made at 23 towns, 28 meetings being held, with a total attendance of 5,000. The valleys of the Eagle, Grand, Gunnison, Uncompahgre and San Luis were traversed, on a tour covering 1,700 miles. The corps of speakers included E. R. Bennett, potato specialist, and H. M. Cottrell, of the Agricultural College; Eugene H. Grubb, member of Board of Agriculture, whose farm at Carbondale was then supplying New York Central dining cars with baking potatoes; E. R. Bliss, Greeley; Jesse Sherman, Eagle; H. L. Edgerton, Carbondale; S. Doll, Gypsum; and R. A. Chisholm of Del Norte. The last-named was introduced to the crowds in the San Luis Valley as the man who had grown 847 bushels of potatoes to the acre.

Dr. C. J. Meyer is agriculturist for the Denver & Salt Lake Railway, co-operating with other agencies in the systematic development of farming and in the settlement of the extensive territory of the Moffat Road. In 1926 a demonstration train was operated over the Denver & Salt Lake Railway, featuring exhibits and lectures on dairying and high altitude vegetable production.

While no other railroads maintain agriculturists in Colorado, considerable educational effort is put forth by all of them. The Chicago, Rock Island & Pacific has been instrumental, for many years, in development of eastern Colorado along safe farming lines, the pioneer in the work for that company being George W. Martin, general agent at Denver. The Union Pacific and the Atchison, Topeka & Santa Fe have participated in educa-

tional campaigns in the state, though under supervision of agriculturists stationed at the various headquarters of these railroads.

THE FARMER AND THE WAR

FARMERS WERE READY FOR WAR.—When the United States entered the World War on April 6, 1917, farmers were already keyed up to the highest pitch of production. Millions of men in Europe had been withdrawn from the industries, adding a vast number to the mass of consumers who were doing nothing to produce. American farmers had participated in supplying the demand thus created for food and clothing, in quantities theretofore undreamed of. The country was prosperous, or apparently so, as high prices prevailed and every pound of surplus food found a ready market abroad. Colorado's gain in exports included dairy products, principally condensed milk, and wheat.

The entry of the United States into the war, while foreseen, instantly created new conditions that promised a double drain on the nation's agricultural resources. The call now was for men as well as food. The farms were to be drained of man-power and yet were urged to keep production up to the maximum. It looked an impossible task, but it was accomplished in a way that distinguished the farmer for patriotism above the record of any other class of citizens. The farmer did not seek nor did he receive any advantage such as that accorded the industrial laborer employed on cost-plus war contracts. Farm products brought high prices, but costs of production kept pace with and often exceeded these advances, so that farmers, as a class, received no private gain out of the war. What was true nationally was true in Colorado.

Production was speeded up on the plea of patriotic service, for the men in the trenches must be fed and clothed and the civil population, now so largely engaged in war effort, had to be sustained from the fields and gardens, herds and flocks of the agriculturist. The first call that came to Colorado farmers, as to others in the United States, was from Woodrow Wilson, President of the United States whose message to agriculture was a state document that set forth the nation's need effectively and that brought an instant response. From this message the following lines are quoted:

PRESIDENT WILSON TO THE FARMER*

PRESIDENT WILSON'S MESSAGE.—The industrial forces of the country, men and women alike, will be a great national, a great international Service Army—a notable and honored host engaged in the service of the

*From *The Western Farm Life*, May 1, 1917.

nation and the world, the efficient friends and saviors of free men everywhere. Thousands, nay, hundreds of thousands of men otherwise liable to military service will of right and of necessity be excused from that service and assigned to the fundamental, sustaining work of the fields and factories and mines, and they will be as much part of the great patriotic forces of the nation as the men under fire.

I take the liberty, therefore, of addressing this word to the farmers of the country and to all who work on the farms. The supreme need of our own nation and of the nations with which we are co-operating is an abundance of supplies and especially of foodstuffs. The importance of an adequate food supply, especially for the present year, is superlative. Without abundant food, alike for the armies and the peoples now at war, the whole great enterprise upon which we have embarked will break down and fail. The world's food reserves are low. Not only during the present emergency, but for some time after peace shall have come, both our own people and a large proportion of the people of Europe must rely upon the harvests in America. Upon the farmers of this country, therefore, in large measure, rests the fate of the war and the fate of the nations. May the nation not count upon them to omit no step that will increase the production of their land, or that will bring about the most effectual co-operation in the sale and distribution of their products? The time is short. It is of the most imperative importance that everything possible be done, and done immediately, to make sure of large harvests. I call upon young men and old alike and upon the able-bodied boys of the land to accept and act upon this duty—to turn in hosts to the farms and make certain that no pains and no labor is lacking in this great matter.

I particularly appeal to the farmers of the South to plant abundant food-stuffs as well as cotton. They can show their patriotism in no better or convincing way than by resisting the great temptation of the present price of cotton and helping, helping upon a great scale, to feed the nation and the peoples everywhere who are fighting for their liberties and for our own. The variety of their crops will be the visible measure of their comprehension of their national duty.

The Government of the United States and the governments of the several states stand ready to co-operate. They will do everything possible to assist farmers in securing an adequate supply of seed, an adequate force of laborers when they are most needed, at harvest time, and the means of expediting shipments of fertilizers and farm machinery, as well as of the crops themselves when harvested. The course of trade shall be as unhampered as it is possible to make it and there shall be no unwarranted manipulation of the nation's food supply by those who handle it on its way to the consumer.

This is our opportunity to demonstrate the efficiency of a great Democracy, and we shall not fall short of it! * * *

WOODROW WILSON.

ON THE COUNCIL OF DEFENSE.—Organization of the State Council of Defense by Governor Gunther included the heads of the various farm organizations. This council named several committees which functioned effectively in organizing the channels of production and distribution. The food supply and what Colorado could do to increase it was the chief item to be considered. How to expand the acreage of wheat and beans and quicken the turn-over of meat animals, while reducing the home consumption of white bread, meat and fats, was the problem put up to the agricultural committees. These committees planned and carried on propaganda among the farmers, calculated to bring about the results desired by the President, who had become in fact, if not in name, the dictator of the nation's course in the World War.

Harmonizing the work of the United States Food Administration which exercised close supervision over the gathering, distribution and use of essential foods, with the demand for increases here and decreases there in production, was the big task of these committees. If their work partook of the nature of propaganda and confined itself largely to organization and suggestion, it was nevertheless a necessary and effective part of a war that witnessed the development of the power of suggestion to a degree never before known or recognized in the world. Without the seemingly intangible thing called public sentiment, no progress could have been made. With public thought guided into patriotic channels the tasks required by the nation became comparatively simple.

ECONOMIC CONDITIONS UPSET.—However, it was not all plain sailing. Economic conditions were upset, men were called from the fields to the front, increased production was urged with depleted man power; there was a shortage of implements, a lack of horsepower, the cost of living was mounting to unheard-of heights, and the farmer, as any other citizen, was importuned to buy Liberty Bonds, to aid the Red Cross and otherwise to do his part financially to help win the war.

He was willing enough, but there came to his notice ugly tales of war profiteering among workers in industry and among contractors, who supplied the armies with ammunition and other necessaries of war. The cost-plus plan of war contracts, the virtual guarantee of big profits to industrial concerns and of reasonable earnings to the railroads; the apparently safe business course of the miller, the meat packer, the banker, all impressed upon the farmer the fact that he alone seemed to be unorganized for war

profits and subject to wind and weather, in spite of Councils of War, fine patriotic speeches and high-sounding phrases of winning the world for democracy.

PRICE FIXED ON WHEAT.—The one commodity that offered a chance for sharing in war profits was wheat, and on that alone the government fixed a maximum price! That seemed unfair, for no such limit was placed on flour for domestic sale; and flour had advanced one hundred per cent from a three-dollar pre-war price to six dollars the hundred pounds. Car shortages, freight embargoes, high transportation costs, farm labor demanding pay on an equality with industrial labor, all were factors in arousing the spirit of discontent which was difficult to suppress, but which was held in check by the farmers themselves, who soon realized, more fully than any other class of non-combatant citizens, that war was aptly described by General Sherman in a famous epigram.

Into this atmosphere of mental disturbance among Colorado farmers came a flock of paid organizers of the Non-Partisan League, a North Dakota political organization, that promised an overturn through a radical program of state ownership of utilities, which found many farmers ready to listen and sign for membership. North Dakota was already under the political control of the organization, through causes other than the war, many of them justifying concerted action for reform. The entrance of the United States into the war, however, opened a new avenue of appeal to the clever propagandists of the League, and they made good use of it. They capitalized discontent and the foreign nativity of many farmers, who leaned toward the German cause, or who had been advocates of neutrality and felt that this nation should have stayed out.

TOWNLEY'S TALK CONVINCING.—The League had as its chief officer A. C. Townley, a gifted organizer and convincing orator, who knew how to play upon the prejudices of the farmer and who shifted his argument to suit his audiences. In North Dakota there seemed good reasons for marketing reforms, long before the war. Townley advocated political action along class lines, and his plan was to form a coalition between union labor and the farmer. In North Dakota, with a small industrial population, he organized the farmers first and then there was little need of labor support except morally. He demanded a complete change in the industrial system, the program which the North Dakota legislature was asked to put through including state ownership of grain elevators and warehouses, flour mills, cold storage plants, meat packing plants, state hail insurance, state standardization and grading of grain, exemption of farm improvements from taxation, state-owned and operated rural credit banks, and the headless ballot.

Seven years after the armistice it seems strange to say that this program was started on its legislative way in North Dakota and that there were many farmers in Colorado and other western states who considered Townley's ideas practical and who were willing to upset the legislative and industrial machinery of these states in the midst of a war that demanded of every citizen unqualified loyalty and support of the existing form of government.

That bitterness was engendered by Townley's descent upon Colorado is not surprising. That he and his cohorts were routed by the sound-thinking farmers of Colorado is to their everlasting credit. Many memberships were sold in the state by the high-powered salesmen of the North Dakota organization and several leaders in agriculture, for a time at least, encouraged the League. Two causes were responsible for this encouragement—a misunderstanding of the League's radical program, and a desire by Colorado farm leaders to keep in their own hands the control of any political movement which, though apparently wild and radical, might be subject to taming under local control. Townley soon felt that his Colorado supporters did not follow him all the way, and he let it be known that there would be North Dakota control in Colorado or no Non-Partisan League. The gravest charge made in this state against the leaders of the N. P. L. was disloyalty, and while this was strenuously denied, it was nevertheless true that the ranks of the League were heavily recruited among foreign-born sympathizers with the Central Powers. This was notably the case in Minnesota and Nebraska. In Colorado it was not so apparent, because of the comparatively small proportion of foreign-born farmers.

AGNES RIDDLE EXPOSES LEAGUE.—In this state it remained for a woman to unmask the League and make public its true purpose as an organization of the elements of discontent. This woman was Agnes Riddle, a former member of the Colorado State Legislature. Mrs. Riddle, who, on retiring from the State Senate, received appointment as a member of the State Board of Agriculture, is a dairy farmer. She became interested in the families of homesteaders on the plains of Arapahoe County and made a remarkable record in the legislature as an advocate of so-called reform measures.

At the annual session of the Colorado Farmers' Congress at the Agricultural College in Fort Collins in January, 1918, there was an address by Thomas Herrington, an attorney, who had been hired by the Non-Partisan League to present the cause of that organization. The Farmers' Congress maintained an open forum for discussion of agricultural questions, and the League was invited to present its case. It was well and plausibly done by Herrington. At the conclusion of his address, Senator Riddle took the floor

and asked the lawyer a few pointed questions and then launched into a ten-minute speech that stripped the League of its garments of sympathy for the ills of agriculture and left it exposed as a mercenary and visionary scheme for Townley-control of state governments and a menace to a nation at war. Senator Riddle frankly admitted having joined the organization, in the belief that it had a helpful program, but that night witnessed her dramatic withdrawal from a movement in which she saw evil to the state and nation.

NO CONSTRUCTIVE PROGRAM.—The League maintained a Colorado organization for two years, but made no legislative headway, as the state ownership program failed from the start in North Dakota and one after the other of Townley's visionary schemes faded out. Colorado farmers, who paid two years' dues, had nothing to show for their money, as the League left no legacy of reform, having nothing constructive to offer.

For a time the faith of many farmers was shaken in their own steady associations, economic and social, but the war's end renewed their confidence in good leadership and constructive political action.

An illustration of the fact that many farmers suffered injustice through the upsets of the war is found in a letter from Sam Russell. Who Sam Russell is makes no particular difference; he was just Sam Russell to the editor who got his letter and published it, as the expression of a voice from a small farmer, whose unfortunate experience with "war prosperity" among farmers of his class was typical. The letter follows:

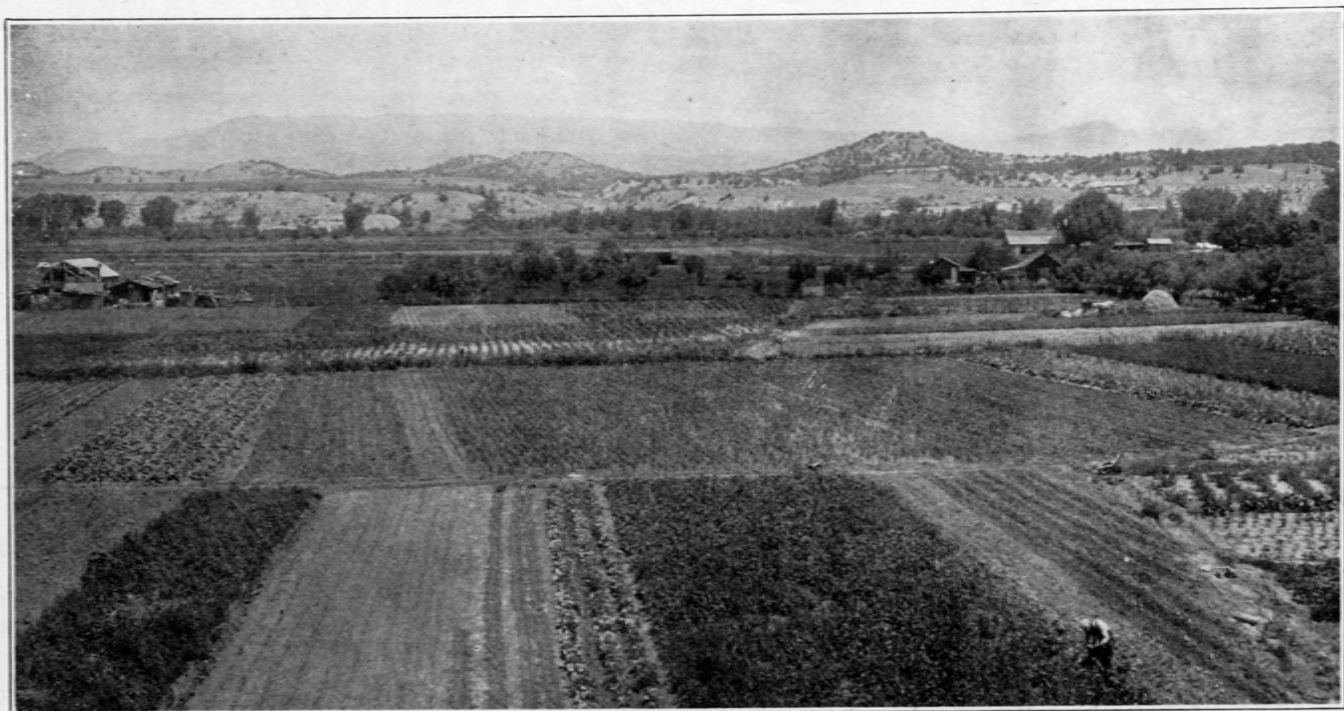
A FARMER'S COMPLAINT.—I am a poor man living on a dry farm. I planted 20 acres of corn and only about a fourth of it came up and what came amounted to nothing. I planted five acres of beans with less result; they never came up. As it might be of some use to you to know how I got through, I bought a crop of dry farming corn of a neighbor who was more fortunate than myself and cut it up and put it in the dry for winter use. The next was to provide for my own provisions. I knew a fellow who had a potato crop near Westcliffe, a distance of about 75 miles from here. I drove over to help him get his potatoes out and I got \$2.50 a day for my work and extra when I used my team. I took my pay in potatoes at \$1.25 per hundred pounds. This was fifteen cents higher than the shippers were paying at that station at that time. This is about the same price the farmer got for his spuds before the war affected prices, when he could get flour at \$2.50, sugar at 16 pounds for \$1.00, lard at 15 cents a pound and compound for 10 cents. Now his flour costs him \$6.00 and \$7.00 per hundred pounds, he gets only 8 pounds of sugar for a dollar, lard costs him 50 cents, compound 35 to 40 cents, so you see the potato man has to give over 500 pounds of spuds for a hundred pounds of flour; at the same time potatoes were retailing in Pueblo for \$3.00 per hundred pounds. Many other things might be taken up to show you that the war is an opportunity for the grafter's harvest and not for the farmer. A few days ago I stopped to speak to a farmer who was unloading some corn at the mill and I asked him what he was getting for it. He said \$2.10. Then I stepped into the mill office and heard a man ask what a sack of corn was worth and he was told \$4.00. The corn had practically doubled in value just going through the mill. I hope these few facts will be of some use to you.—Sam Russell, Pueblo County, Colorado. From the *Western Farm Life*, December 15, 1917.

In spite of it all, however, the Colorado farmer did his part to help win the war. He sent his sons to France. Youth left the farm for Flanders while Age kept the home-fires burning; some are still tending the fires in sorrow. All have since realized that the troubles of the non-combatants, serious though they seemed, were trivial compared to the misery undergone by the men at the front.

WHEN DEFLATION CAME.—It was after the war that agriculture had its real test. Inflated land values and inflated prices for farm products and livestock, collapsed. Deflation came without warning and it affected the price of land and the produce of the farm more quickly and severely than the cost of things the farmer has to buy. Credit was withdrawn, loans were called and there were many foreclosures, with losses to farmer and banker alike. Taxes remained where they were, at the peak, or mounted higher, so that agriculture was in a bad way beginning with the autumn of 1920 and through the succeeding three years.

Lately there has come gradual recovery. These events are still too recent to be considered in their proper historical perspective. One fact is evident, namely, that Colorado, along with other sparsely populated western states, that have both arable land and water, may look forward to the development of new agricultural wealth, with the passing of the years. Though free homesteads are practically gone, the great areas of unused land held at reasonably low prices insure development of new farms, as the increasing population of the nation and world calls for more food.

One result of post-war economic distress in agriculture is the conviction, strong among Colorado farmers, that they carry more than their just share of the tax burden, because of their tangible assets. Untilled lands held for speculation carry no load, while the developed farm is taxed to the limit, no matter how heavily mortgaged. And the mortgagee, who often has the major equity in the farm, shares none of the tax load.



Truck farms in the Canon City district.

CHAPTER XII

Development of Fruit and Vegetable Growing*

The history of horticulture in Colorado is parallel with the general history of agriculture and livestock. By force of circumstances the early settlers were obliged to grow vegetables and fruit to supplement their bread and meat. Commercial horticulture began with the development of transportation and home markets. Later, development grew out of a demand for Colorado fruit and vegetables by out-of-state customers. This demand has constantly been increasing, due to the superior quality of the products. It should not be supposed that our present horticultural production was attained without many trials and failures, for the early settlers came from the East and naturally brought with them the knowledge they possessed in their former homes. This knowledge, while limited and unsuited to Colorado conditions, was utilized as a starting point in fruit growing.

LEE PLANTED FIRST ORCHARD.—The first orchard in the Arkansas Valley, and in the state for that matter, was planted by William Lee in 1862, not far from Canon City. It was destroyed by a flood from Spring Creek the same year, but was replanted in the spring of 1863. The orchard, however, was not extensive, and due to neglect is almost destroyed. In 1867 Jesse Frazier planted the first orchard at Florence, Fremont County, and the same year established the first nursery in the state.

When the orchard was in its prime in 1883, it was described by a visitor as follows:

After dinner we went over to Jesse Frazier's to show Charley Cross, who accompanied us, the best orchard in the state. We have described this orchard so often that we shall confine ourselves this time to a few statistics. The first trees he set out was in 1867—setting out about 20, which came to Denver by wagon across the plains, lay in a corral there several days and then came on down here. In 1869 he procured 10,000 root grafts and set them out in nursery rows, transplanting as he needed them, or as they became suitable for that purpose. The same year he got 200 trees from the Bloomington Nursery, hardly any of which lived. He has purchased and set out more or less every year since. He now has about 2,000 trees in bearing condition and about 1,000 not bearing. He says the Ben Davis apple tree will produce about ten times as many pounds of apples as almost any other kind. Of this variety he has between 600 and 700 in bearing condition and about 400 not old enough to bear. He set out his Ben Davis trees in 1872—has had four large crops from them and they are now loaded as full as it is possible for them to be. He says they will yield an average of from 700 to 800 pounds of apples to the tree.†

*Dr. E. P. Sandsten, State Horticulturist, furnished most of the statistical data and considerable of the historical material incorporated in this chapter.
†Fremont County Record, June 30, 1883.

THE ROCKAFELLOW ORCHARD.—From the Frazier nursery, Captain B. F. Rockafellow bought his trees and planted the second commercial orchard in the state in 1869, or 57 years ago. Rockafellow planted in all about 80 acres to apples. A larger share of the trees are still producing commercial crops. At that early date, little or nothing was known about varieties. Captain Rockafellow came from Michigan and naturally planted varieties with which he was familiar and in addition to these all other varieties that were offered by the nursery. An inventory of Captain Rockafellow's orchard was made and shows sixty named varieties. Nine-tenths of these are looked upon today as non-commercial and non-profitable; however, the orchard has served a useful purpose in aiding prospective growers in the selection of suitable varieties. Captain Rockafellow's contribution to the fruit industry can hardly be over-estimated. He was not only a practical fruit grower, but also a leader in his field and took a prominent part in the work of the State Horticultural Society and in local organizations of fruit growers. He and others in those early years demonstrated the fact that the upper Arkansas Valley was a fruit section and extensive orchards in this district are concrete evidences of their judgment.

Another pioneer in fruit growing is Senator J. H. Crowley of Rocky Ford, who planted the first commercial orchard in the lower Arkansas Valley. His planting was a starting point to later extensive plantings around Rocky Ford and Manzanola. Senator Crowley's orchard is still in good condition and bearing commercial crops. Senator Crowley was for a number of years president of the State Horticultural Society and did much to promote the development of fruit growing.

Wild fruits were never of commercial importance, though the early settlers found mountain raspberries and choke cherries, as well as the plums, which in the early days were far more plentiful than now, a welcome addition to the limited menu of the pioneer family table.

During the rush of gold-seekers, when merchants in the mining camps were reaping a larger harvest of wealth than the Argonauts, fresh fruit was scarcer than gold dust. Dried apple pies were a delicacy; fresh apples merely a dream of days gone by, back beyond the Missouri.

APPLES \$1.25 EACH.—When John Martin, who kept a fruit stand on Blake Street, Denver, received his first consignment of apples by express in the fall of 1859, they were worth their weight in gold. He related, in after years, that he got \$1.25 apiece for apples and that a certain young man whose identity he did not disclose, bought four apples from him for five dollars, the fruit being intended as a present, in lieu of roses, for a

young lady lately arrived from the States by emigrant train. Girls were scarce and so were apples, consequently the young man, who had been lucky as a gold hunter, did not complain of the price.

Pineapples were even more expensive, Martin declaring that he sold a few of these at \$7 each, while oranges went for the comparatively modest figure of \$2.50 to \$3 each. His first shipment of sweet potatoes cost Martin \$1.35 a pound, this being mostly for the express, and he offered them for sale at \$1.50 a pound, his first customer being a Chinaman, who bought two pounds.

STRATTON'S FRUIT REPORT.—Harris Stratton of Fort Collins, first secretary of the State Board of Agriculture, investigated fruit-growing possibilities in a tour of the Clear Creek Valley, from Denver to Golden, in 1877. He visited the orchards of M. N. Everett, David Brothers, Harpin Davis, J. W. Cook and Wilson Perrin. His conclusion, announced in a report to the board, was that apples, grapes and cherries could be profitably grown on certain soils and slopes west of Denver, but that peaches were out of question and pears not a success, with plums also making a rather poor showing.

On the Everett farm at Wheatridge he found 260 thrifty apple trees, 1,600 seedling peach trees and 3,000 chestnut trees. The chestnuts had been winter killed, while the peach trees were alive and sound, having fruited a little in 1875. On Harpin Davis' place several hundred peach trees had been planted, but they did not survive. J. W. Cook had a vineyard of 2,500 vines which in 1877 had produced 20,000 pounds of grapes, selling at 15 cents the pound. These were of the Concord variety. Stratton's conclusion was: "I am convinced that Colorado will eventually prove a good fruit state." The orchard of David Brothers was among the earliest to be planted, twelve apple trees being set out by Brothers in 1868.

McCLELLAND'S ORCHARD.—Fruit growing in northern Colorado owes its beginning and development to two outstanding pioneers, James S. McClelland and Charles Pennock, and a brief sketch of each may be of interest.

McClelland planted the first commercial orchard near Fort Collins in 1876. He gradually increased his planting to over 100 acres. The McClelland orchard has been of exceptional value to northern Colorado and to the Agricultural College. Mr. McClelland attempted the growing of every variety of fruit, as well as nut trees and shade trees offered by nurseries. His farm was a real testing ground for the northern portion of the state. Later plantings in this section were based upon the experience of McClelland and costly errors in planting wrong and unprofitable varieties were avoided. At one time he had one hundred and sixty-five varieties of apples

growing in his orchard. In addition to his extensive orchard he found time to serve his state and the fruit industry in public ways. He was president of the State Horticultural Society and did much for the general development of the industry. He was also a member of the State Board of Agriculture and was greatly interested in agricultural education. Most of the original orchard is still in bearing and his work and interest are ably being carried forward by his son Henri McClelland.

PENNOCK'S UNSELFISH SERVICE.—Charles Pennock of Bellvue, another pioneer fruit grower in the Cache la Poudre Valley, has done much for horticulture in Colorado and adjacent states. Mr. Pennock planted his first orchard in 1889 and about the same time started a small nursery. He improved and introduced the Rocky Mountain cherry and was the first one to cross this plant with the native plum. The original hybrid is still growing on Pennock's place.

Mr. Pennock at one time had over 100 varieties of apples growing in his orchard, over 100 varieties of strawberries and an equal number of plums, besides collections of small fruits and grapes. He has grown and tested out more horticultural varieties of fruits than any man in Colorado, and his homestead is a mecca for horticulturists and others interested in fruit growing.

Relatively few people are acquainted with Mr. Pennock's work. It is not advertised. He is not doing it for money, but for the enjoyment he gets out of it. The commercial grower would call it a failure, but to the student and the lover of trees and plants for their own sake, Mr. Pennock's work is both instructive and interesting. He has now growing on his place a chestnut tree that is 18 years old and over 30 feet high. It is a wonderful sight to see in full bloom.

WESTERN SLOPE DEVELOPMENT

UNFIT FOR HABITATION.—After sixteen days in Uteland in the summer of 1880, three travelers pronounced the country unfit for civilized man. They made exceptions only of "some small valleys along the North Fork and the Grand," and thereby saved at least a shred of their reputations for prophecy, for these valleys became world-famous for their fruit within the decade that followed this unfavorable report, given in an article entitled "Roaming the Reserve" in the Denver Tribune of July 9, 1880, the last paragraph of which follows:

The whole country, with the exception of some small valleys along the North Fork and the Grand is too rugged and mountainous to possess any value for agricultural and grazing purposes. Goats and mountain sheep might find it to their taste and no one who has seen it can begrudge its quiet possession to the Utes. For civilized man it is apparently about as valuable as would be a representative section of the Desert

of Sahara. To parties contemplating a visit to this region, our advice would be, don't go. Except to the seeker of excitement in toilsome and dangerous mountain climbing, or the ardent sportsman, or the lover of the picturesque and grand in nature, there is absolutely nothing to tempt anyone to the northwestern section of the reservation.

The party was composed of Dr. N. Jennings of Gunnison, E. C. Smith, referred to as "the well-known scout" and a representative of the Denver Tribune, whose name was not given.

Two years later, after removal of the Utes, there was a rush of settlers to these "small valleys" along the North Fork of the Gunnison and the Grand (now properly designated as the Colorado), and in a decade the country had been converted into commercial orchard districts that have few counterparts in western America.

PABOR SAW THE POSSIBILITIES.—William E. Pabor, author of "Colorado as an Agricultural State," was one of the first to give public expression to the fact that the Grand Valley was particularly adapted to fruit growing. Before the Ute Indians were moved to Utah, Pabor toured the Western Slope and wrote a series of travel and development articles, afterwards incorporated in his book. He believed what he wrote about the Grand Valley, for he went across the range again in 1882, after the land was opened to settlement, and bought four sections north of what is now the town of Fruita.

In the spring of 1883 he laid out ten or twelve tracts which he planted to fruit—apples, pears, peaches, cherries, apricots, plums and grapes, including the Muscat and Flame Tokay. Pabor had studied all regions of Colorado carefully with reference to their adaptability to various types of agriculture and horticulture. His unqualified endorsement of the statements made to him by the few white settlers in the Ute country did much to arouse interest in development. His appraisal of the possibilities was fully borne out after the orchards came into bearing.

Pabor was the founder of "Fruitvale," the first fruit-tract community laid out in the Grand Valley. This community centered around the town of Fruita, 12 miles west of Grand Junction, and is not the Fruitvale of today, a district a few miles east of the metropolis. Tracts of 5, 10 and 20 acres were platted and set to a variety of trees, vines and small fruit.

FIRST TREES SET OUT.—About the time that Pabor set out orchards at Fruita, Charles W. Steele and Elam Blain set out fruit trees two or three miles east of the site of Grand Junction, and here were raised the first apples and peaches in the valley. Those who saw the peaches demanded to know where they were grown, and, when told, refused to believe it until they had personally seen the fruit on the trees.

A man named Harlowe on Rapid Creek, two miles east of Palisade, also was among the first to grow peaches, though he had only a few trees. The first large peach orchard was set out east of Fruita by Rose and Miller of Colorado Springs. They were assisted by Bernard Hughes, who also helped Pabor in his enterprise. Some of these early orchards did not live long, because constant irrigation caused the soil to become waterlogged.

The first orchards on what are known as the Fruit Ridges were located one, two and three miles north of Grand Junction, the very first being set out by A. M. Olds. This was later purchased by Dr. F. R. Smith. The first varieties of apples set out on this orchard were the Pewaukee, Yellow Transparent, Red Astrakan and Belleflower. The original apple trees have been taken out and the land set to pears of the Keiffer and Bartlett varieties, which are still making money for the owners. This orchard was set out in 1883, the trees being bought from the first nursery located in the valley, started in 1881 by D. S. Grimes, a Denver nurseryman. Robert A. Orr was sent from Denver by Grimes to take charge of the nursery and he bought out the Grimes interest in 1882. He added more stock, which was obtained from a nursery at Shenandoah, Iowa.

BROUGHT HARDY VARIETIES.—According to the late A. C. Newton of Grand Junction, a fruit grower and writer on horticultural subjects, the first apple trees brought to the Grand Valley were of the hardier varieties, such as the Snow, Walbridge, Bailey Sweet, Tallman Sweet, Red Astrakan, Geniton, Maiden Blush, Early Harvest and others—no Jonathan, Winesaps or Pearmain. This was for the reason that the early settlers had no definite knowledge concerning winter temperatures and they were judging by the winter of 1882, which had been very severe.

William Bomgardner set out a part of his twenty acres in those days as fast as he could get the land ready, and Robert Orr set out an orchard in 1885, which he owned until 1924. He planted a good many peaches, plums and cherries, which bore constantly for twenty years. The tendency in the early days was to take a catalogue and order a few trees of every variety. In the Bomgardner orchard there were as many as eighty-four varieties of fruits, which the owner took to the State Fair at Pueblo. He was beaten by an exhibit from the Rockafellow orchard at Canon City, showing 120 varieties.

WERE MANY DOUBTERS.—There were many doubters when Colorado first began to claim successful fruit production for certain localities. These doubts were the natural result of early mistakes, the first settlers trying out crops to which they had been accustomed "back East." Those who came from orchard districts were inclined to plant fruit trees, and much

nursery stock was bought and planted in sections unfit by altitude, soil, moisture and other conditions for the propagation of trees, bush fruits or vines. The United States Department of Agriculture, in an official statement as late as 1888, declared Colorado climatically unfit for fruit culture. At that time the Canon City district was well established and there were thriving orchards in the Clear Creek Valley and in Boulder and Larimer Counties. Even the Western Slope orchards were giving promise of good things to come.

REFUTES GOVERNMENT STATEMENT.—Alexander Shaw, Secretary of the Colorado State Horticultural Society, refuted the government's statement with a declaration in one of his reports as follows: "Barring the scant water supply, we have the elements of fruit growing to an eminent degree, and assert, in all instances, success has crowned the efforts of all careful, painstaking culturists that have had water at command. Our apple crop for the current year fully demonstrates this assertion. Most of our orchards are just coming into bearing, but a recent inspection warrants me in the estimated yield of 60,000 bushels the current year."

It was in 1888 that a correspondent of the *Colorado Farmer* (issue of April 12) wrote about a visit with S. A. Wade, the pioneer fruit grower of the North Fork Valley of the Gunnison in Delta County.

"Stayed over night with Brother Wade," he writes. "He showed me what I had never expected to see in Colorado—a peach and apricot orchard laden with bloom, not a limb, branch or twig injured by freezing, frost or other cause; cherries, plums, pears, apples, quinces and all the small fruits show as strong promise of a greater yield than I ever saw before in any country."

At that time the Delta County Horticultural Society was holding quarterly meetings, with Wade as president and N. S. Coburn secretary.

A NORTH FORK PIONEER.—Wade was the first to set out an orchard in the North Fork country. His own story, as he wrote it for the *Colorado Farmer* of November 12, 1885, follows:

On the first of September, 1881, E. T. Hotchkiss, myself and others came into the Valley of the North Fork and while making a stay of only one day, I discovered thorn apple and buffalo berry growing luxuriantly and in abundance. Therefore, with this evidence before me, I became strongly of the belief that many varieties of fruit might be grown here and resolved at once to make the trial. The following spring I brought with me from the State of Missouri, an experimental bill of fruit trees and plants, together with some forest trees. This consisted of 200 apple trees of the following varieties: Winter Winesap, Genette, Ben Davis, Maiden's Blush, Early Harvest, Hislop, Transcendent and Sylvan Crabs; 10 Bartlett Pears, 10 Early Golden Apricots, 20 Early Golden York Peaches, Hale's Early Crawford, Early Stump, the world-old Mixen Cling; 200 cherries, Morrell variety; 5 Osage quinces; 100 grape vines; Concord and Delaware; 1,000 blackberry plants of the Kittatines and Lawton varieties; 100 Turner and Mammoth Cluster raspberries; 12 Red Dutch Currants; 50 Houghton gooseberries; 500 silver leaf and soft maple trees, with quite a bill of the ornamentals.

All these trees and plants were one-year-old and after shoveling snow for about three weeks on the Black Mesa, I succeeded in getting onto my ranch (now Paonia), on the 21st day of April, 1882, where I unpacked my trees after being packed two months. I trenched them out and proceeded to clear up the ground and to build a two-mile ditch for the purpose of irrigating these trees and such crop of grain and vegetables as I might be able to get in that spring. (The letter went on to tell that Wade lost a third of the trees as his first planting was on adobe soil. However, he replanted.) Right here I venture the prediction that in five years from this date, Delta County will have the brightest prospect and can make the best showing, time considered, of any other county in this great state.

COLLEGE SURVEYS THE INDUSTRY

CRANDALL COVERS THE STATE.—Rapid development of the Western Slope fruit industry is noted in a survey made by Charles S. Crandall, horticulturist, of the Colorado State Experiment Station, and reported in Bulletin 17, issued October, 1891, less than ten years after the first orchards were planted in that section. The survey included the entire state, which the writer divided into geographical districts. The western district included Montrose, Delta and Mesa Counties. Quotations follow:

DELTA COUNTY STARTED 1882.—The development of these counties has been phenomenal. In the tenth year after the removal of the Ute Indians and the opening of the reservation to settlement, the fruit growers of these counties place before the public the largest and finest exhibition of fruits ever shown in the state, and the best the writer ever saw in any state. The first planting of fruit was made in Delta County in 1882 and soon after small areas were planted in Mesa County. It was not, however, until the year 1886 that planting became general. The wonderful growth and precocity exhibited by the trees first planted on the North Fork and about Grand Junction and Fruita serve to prove the adaptability of the soil and the climate to the raising of fruit and a large area was that year planted. In Montrose County the early settlers devoted themselves entirely to the raising of farm crops and vegetables up to the year 1886; then fruit planting commenced and the county now has 600 acres of growing orchards with every indication that this area will rapidly increase. Trees seem to do equally well, whether on the adobe soil of the river bottoms or on the red, sandy loam of the higher mesas. So universally successful is the growing of fruit that the industry bids fair to surpass all other industries of the county.

MONTROSE COUNTY ORCHARDS.—Montrose County orchards mentioned in the bulletin were those of William B. Upton, Judge John C. Bell and Bell Brothers. Judge Bell's orchard was stated to be on mesa land at 6,700 feet, covering 65 acres. It was planted in 1889 and at the time of Crandall's visit contained 3,000 apple trees, 3,000 peach trees, 500 pear trees, 75 cherry trees, 50 apricot, 50 plum and a few miscellaneous trees. The express shipments of fruit from Montrose that season aggregated 31,225 pounds.

Delta County was mentioned as making good progress, the first orchards planted in 1882 by Coburn, Wade and Hotchkiss doing well. The county then had 600 acres in orchards. W. S. Coburn was quoted in the bulletin as follows: "Peach trees have produced five successive full crops and are still in a healthy, thriving condition and with proper pruning and care give promise of a long life."

One of the large orchards near Delta at that time was that of W. O. Stephens, which contained 950 apple trees, 1,150 peach trees and the balance pears, plums, quinces and apricots. This orchard was started in 1886, with further plantings in 1888 and 1889. At the time of Crandall's visit Stephens had just harvested 12,000 pounds of grapes, which he sold at three to five cents a pound. Shipments by express from Delta that year, mostly peaches and apples, aggregated 198,680 pounds.

PROGRESS IN MESA.—Regarding Mesa County, Crandall said:

The estimated area of Mesa County orchards is 1,500 acres. The largest orchards in the state are in this county and at the present rate of planting, this area will soon be doubled. A few orchards are planted on the bottom lands of the Grand River, but the mesa lands back from the river are considered the most desirable and it is here that most of the orchards have been planted. Near Fruita is the 80-acre peach orchard of Rose Brothers and Hughes, containing 12,000 trees now in their prime and bearing abundantly. The shipments from this orchard this season aggregated 92,000 boxes. Adjoining is the large orchard of Mr. A. B. Johnson, one of Mesa County's most successful fruit growers. Here also is the newly planted orchard of Kiefer Brothers, covering 160 acres. A few miles up the river above Grand Junction is the orchard of Mr. C. W. Steele. It would be difficult to find 35 acres as productive and well cared for as are those occupied by this orchard.

Steele said he commenced planting fruit trees in 1886 and that in 1889 he had a full crop of peaches. Some of his trees yielded 100 pounds each and brought ten cents per pound wholesale. The apples were Rome Beauty, Ben Davis and Missouri Pippin.

Express shipments from Mesa County that year were as follows: Grand Junction, 217,767 pounds; Fruita, 131,282 pounds; Whitewater, 85,100 pounds.

The orchard of Governor Crawford on Rapid Creek above Grand Junction was described by Crandall. This covered sixty acres. It contained 6,000 trees and 8,000 grape vines, set in 1890, and 2,000 trees set in 1891. There was also a description of orchards in the Grass Valley in Garfield County, where about 250 acres had been planted. In the northern district, which included all territory east of the range and north of the Arkansas divide, Crandall estimated that 2,850 acres had been planted to orchards. Arapahoe County had 600 acres, mostly in the immediate vicinity of Denver. The oldest orchard in that county, according to Crandall, was that of L. K. Perrin in North Denver, and the largest that of Stark Brothers near Littleton, which covered 93 acres and contained about 12,000 trees, mostly apples. Colonel A. C. Fisk had an orchard in the southern suburbs of Denver, containing 3,000 apple, 1,500 plum and 50 cherry trees. A 15-acre apple orchard at Elitch's Gardens, Denver, also was mentioned.

JEFFERSON COUNTY ORCHARDS.—Jefferson County was credited with 700 acres devoted to fruit, some of its orchards having been planted as early as 1868. Prominent fruit growers in that county were: David Brothers,

John Tobias, William Lee and Henry Lee. The Brothers orchard, the oldest in Clear Creek Valley, had a crop of 1,000 barrels of apples at the time of Crandall's inspection.



Picking peaches near Palisade in the Grand Valley, Colorado. (Photo by George L. Beam.) Courtesy Passenger Department, Denver & Rio Grande Western.

BOULDER STARTED IN 1866.—Boulder County in 1890 had 500 acres in fruit, with 200 acres added during 1891, mostly in the vicinity of Boulder. The first introduction of fruit along the St. Vrain dates back to 1866. Statistics on Boulder County production for 1890 included 29,616 bushels of apples, 265,990 pounds of grapes and over 50,000 quarts each of strawberries, blackberries and raspberries. There was also included 1,035 gallons of wine. The estimated area of fruit in Larimer County at the time of the Crandall survey was 600 acres, the growers mentioned being McClelland, Pennock, W. F. Watrous, J. E. Plummer and A. M. Hoag.

BROUGHT IN BY WAGON.—Regarding Fremont County, the bulletin used a statement made by President W. B. Felton of the State Horticultural Society, which follows:

The first fruit trees were set out in Fremont County in 1867. Mr. W. C. Catlin went to Pueblo for an invoice of trees which had been ordered by himself and by Governor Anson Rudd, Mr. W. A. Helm, and Mr. Jesse Frazier. They had been brought across the plains in a wagon to Pueblo and Mr. Catlin brought them to Canon, something over \$500 worth of trees occupying a small space in his wagon. A few of these trees and only a few are still living. After his first attempt, which was almost a total failure, Jesse Frazier procured several thousand root grafts and set them out in nursery rows. When they became large enough, he transplanted them into his orchard.

At that time Frazier's was the largest bearing apple orchard in the state. The crop for the year 1888 was estimated at 15,000 bushels, bringing the total production for the first ten years of its bearing existence above 53,000 bushels. Shipments from Fremont County during the season aggregated 720,817 pounds of fruit, including apples, pears, grapes, plums, peaches, strawberries and other berries. These figures appeared in the Crandall bulletin.

APPLE BOOM IN GRAND VALLEY

About 1895 the apple boom struck the Grand Valley, and soon thousands of acres were planted to apples, mostly in five, ten, twenty and forty-acre lots. The promoters knew little or nothing about soil, varieties or sites for orchards. Thousands of acres were planted to apples that were not apple land. Prices mounted sky-high. A considerable portion of these newly planted orchards sold to eastern people, mostly professional men and women who knew little about fruit growing, but bought with the hope of making a fortune.

SERIOUS PROBLEMS DEVELOP.—While the soil and climatic conditions were on the whole favorable for the production of high-grade apples, serious problems resulted from excessive use of water and lack of soil drainage, and later by the accumulation of niter in the soil. These problems were not at first apparent, but gradually developed as the apple industry expanded. After a boom, there followed a period of reaction and liquidation, which started about 1912 or 1913. Much of the land then changed ownership and many orchards were pulled out, especially on soil not adapted to fruit growing. Diversification of crops has now been introduced. The remaining orchards are better cared for and the industry is on a better footing than in the past.

The Grand Valley is perhaps most famed for its peach orchards, and Palisade peaches are known nationally. This peach district is the most highly developed and most compact district in the United States.

DELTA COUNTY KEPT STEADY.—The topography of Delta County is quite different from that of the Grand Valley. The valleys are narrow and the adjacent land consists of broken terraces or mesas. This type of land

is admirably adapted for growing all kinds of tree fruits. Both soil and air drainage are good and crop failures are practically unknown. This district did not experience the boom that the Grand Valley did and, consequently, prices were held to the actual value of the land. There have been a few failures in this district and the growers have on the average made money.

Montrose County has a limited area adapted to apples, but the high altitude makes crop production more hazardous and there is no present tendency to extend commercial fruit growing.

SEEDLESS APPLE PROMOTION.—There was a stir among orchardists on the Western Slope in 1905, when it was announced that the seedless apple had been developed as a commercial possibility. A company was organized, known as the Spencer Seedless Apple Company, to start a nursery with a stock of two million budded trees from five parent trees, which, according to newspaper accounts of the time, were bearing apples that had no seeds and from which the pithy core had been practically eliminated.

No less a personage than King Edward, the then reigning monarch of Great Britain, was one of the first to get a bite of the seedless fruit produced in an orchard at Grand Junction. Four apples were sent to Windsor Castle, and, according to newspaper accounts, the king ate thereof and rendered this verdict: "Delicious; the best apple I have ever tasted." According to the same account, only one apple was eaten by His Majesty, the other three being disposed of at auction for sixty shillings.

From the original stock of what the promoters called seedless apple trees, two thousand trees were budded, and these were to furnish the two million nursery stock, to be sold at \$2 each, to make the stockholders rich and provide for the consumer of fruit a coreless apple. Old-timers at Grand Junction say there was only one tree that really produced any fruit that was seedless, but that the quality was poor and the flavor lacking, so that there was no promise of commercial success. At any rate, the project, which proved a nine-days' wonder in the western fruit regions, never got beyond the promotion stage.

It so happened that Dr. E. P. Sandsten, now of Colorado, was state horticulturist of Wisconsin at the time. The originator of the so-called seedless apple had come from that state. Dr. Sandsten was in position to warn the public against investing in what he recognized as a losing venture, and soon nothing more was heard of the seedless apple.

NORTHERN COLORADO ORCHARDS

Fruit growing in northern Colorado is confined to the foothill area and to the valleys close to the mountains. This area extends from Denver to

a few miles north of Fort Collins. The industry as a whole is quite extensive. The home market is excellent and most of the crop is sold in the orchard or nearby towns. Due to the limited area suitable for fruit growing, the industry may never attain great commercial importance. It will undoubtedly develop to the extent of supplying the local need and the demand from the plains area north and east.

CHERRY ORCHARDS FLOURISH.—In recent years cherry growing has been developing rapidly, especially in Larimer County, in the vicinity of Loveland and Fort Collins. Sour cherries are grown in that district for shipment to the pie bakeries of Kansas City and Chicago. Many of these orchards are planted on hillsides, with little water for irrigation. In fact, some have done well without artificial watering, though, when the trees begin fruiting, irrigation is required to keep them in profitable production. The growing of sour cherries in northern Colorado is a development of the last fifteen years. On the Western Slope, in the Canon City district and in the lower Arkansas Valley both sweet and sour cherries have been produced commercially over a longer period. With proper care certain hardy varieties of cherries are grown successfully in family orchards on the dry lands of eastern Colorado.

SOUTHWESTERN FRUIT SECTIONS.—While the commercial fruit production is in the main confined to the upper Arkansas Valley and to Mesa, Delta and Montrose Counties, there is a considerable area of land in Montezuma County, in the southwest corner of the state, that is adapted to all kinds of deciduous fruits, particularly apples, pears, peaches and cherries. This district is undeveloped so far as commercial fruit growing is concerned, though a number of small orchards exist, enough to supply the local demand and for small shipments during years when prices are attractive.

In La Plata County there is a well-developed fruit area in the Animas Valley, north of Durango. The area is limited, due to the topography of the valley, but is on the whole well adapted to commercial production of apples, cherries, plums and pears. The local markets of Durango and nearby furnish an outlet.

The lack of transportation facilities in the matter of time and high rate of freight are controlling factors in the development of this district, though with adequate transportation the district will undoubtedly become important in fruit production.

FRUIT GROWING STATIONARY.—During the past ten years the number of acres devoted to fruit trees in Colorado has been stationary. While there has been considerable planting of almost all kinds of fruit trees, there has also been a great number pulled out because of unfavorable soil condi-

tions, neglect and unsuitable varieties. The only permanent increase has been in the peach industry, as a result of the development of the upper portion of Orchard Mesa. This new district, south of Palisade, promises to become an important peach producing center.

STATISTICAL INFORMATION.—Apples, peaches, pears and sour cherries form the bulk of Colorado's fruit production. While apricots, plums and sweet cherries are important, the acreage devoted to these is relatively small. The extent of the fruit industry is apparent from the following figures, compiled from a survey made by the horticultural department of the Colorado Experiment Station. The number of apple trees in the state is 1,666,073; the number of peach trees, 650,000; the number of pear trees, 314,370; the number of plum trees, 17,714; the number of sour cherry trees, 296,759; the number of sweet cherry trees, 10,560; the number of apricots, 7,180. A full production of apples is approximately 3,500,000 bushels; peaches, 1,000,000 bushels; pears, 850,000 bushels; sour cherries, 1,000 tons; sweet cherries, 750,000 pounds. The value of the tree fruits is estimated at over \$6,000,000.

This represents only what is called the commercial crop—that is, fruit that is picked and shipped to the large centers of consumption. It does not include shipments by parcel post, by express nor by truck and the consumption in the local markets. It is safe to place the value of Colorado tree fruit production at \$10,000,000 a year. Outside of the commercial fruit growing sections, considerable quantities of fruit, both for home use and for local trade, are grown in a number of counties, and the fruit so produced does not figure in calculating the commercial crop.

HORTICULTURAL SHOW IN 1889

The first horticultural show was held at Denver in January, 1889, in Gettysburg Hall. Dr. Alexander Shaw, secretary of the State Horticultural Society, was the promoter and manager of the exposition, which included fruits, flowers and fish. In the fruit division the feature was the apple exhibit and the principal exhibitor in that line was Jesse Frazier of the Canon City district. It was stated at the time of the exposition that Frazier "has this year gathered from his trees 12,000 bushels of apples, which is one-fifth of the whole crop of Colorado apples."

At that time the fruit industry was in its infancy on the Western Slope, the only exhibitor from that district mentioned being Samuel Wade, the pioneer commercial orchardist from the North Fork of the Gunnison.

The State Agricultural College had an exhibit in charge of James Cassidy, horticulturist. This included grains and grasses and samples of the forge and bench work of the students. No fruit was mentioned

as being exhibited by the college, but Professor Cassidy personally had an entry of apples.

The exhibit of fish was in charge of the State Game and Fish Department, its purpose being to stimulate interest in the production of trout, bass and other game fish for market.

Among the exhibitors of apples, Jesse Frazier led the list with forty-eight varieties, others from Fremont County being as follows: D. C. Green, John Pierce, J. A. and J. N. Toof, S. H. Glanville, Dr. Craven, R. A. Gardner, John Locke, Henry Earl, W. B. Felton, J. H. Harrison, John E. Cook, Henry Sertor, W. J. Johnson, W. C. Catton.

Larimer County was represented by: Mrs. J. S. Washburne, Mr. Quigley, Mrs. M. J. Gard, Mrs. W. W. Taylor, James Ackerman, A. T. Gilkison, Professor Cassidy, A. N. Hoag.

Boulder County apple exhibitors were: George McIntosh, H. G. Childs, S. F. Randall, M. E. McKnight, J. Reynolds.

Jefferson County exhibitors were: W. W. Wilmore, Harpin Davis, Henry Lee, Harvey Stuart, J. Benedict, Mrs. Richards, John Elitch, Elwood Easley, David Brothers.

Selections were made from the apple exhibits for showing at the World's Fair in Paris and at an exposition in Boston.

PERMANENT EXHIBIT MAINTAINED.—Other state shows were held under auspices of the Horticultural Society, that organization flourishing many years and doing much toward the development of permanent markets for Colorado fruit, as well as fostering educational work and giving opportunity to growers for exchange of ideas and experiences. A permanent exhibit was maintained at the state capitol in Denver many years, where tourists might view it and obtain information as to fruit-growing possibilities and the opportunities for acquiring fruit lands. In 1883 the Legislature passed an act to "encourage horticulture and forestry and to establish a State Board of Horticulture." An appropriation was made in support of the bureau and the exhibit maintained at the capitol. Later the duties were taken over by the State Board of Agriculture, which is now also the State Board of Horticulture.

NATIONAL APPLE SHOW.—A National Apple Exposition was held at Denver in January, 1910, thirteen carloads of fruit being placed on exhibition from Colorado and other western fruit growing states. Prizes amounting to \$17,000 were distributed, Grand Junction receiving the grand sweepstakes for best carload of apples, this prize amounting to \$1,000. The apple crop of 1909 had totaled 4,300 cars, which was nearly double that of the previous year, and prices obtained had run from \$1.25 to \$2.00 a box.

The Western Slope orchard districts have been constant exhibitors of their product at the State Fair, and Delta County has frequently won sweepstakes at that exposition.



An orchard in the Surface Creek Country, North Fork Valley. (Photo by George L. Beam.) Courtesy Passenger Department, Denver & Rio Grande Western.

DR. SANDSTEN'S FORECAST.—In answer to the question: "What are the future possibilities for fruit growing in Colorado?" Dr. E. P. Sandsten, state horticulturist, said:

What are the future possibilities for fruit growing in the state? There are thousands of acres capable of commercial production that are today either idle or utilized for the growing of farm crops, adapted to fruits of various kinds. They offer possibilities for settlers who have the necessary experience and capital. Fruit growing is a highly specialized type of production, and the average person is not apt to make a success of it. The industry will undoubtedly expand in the future, but it will be a slow and steady increase to meet the demand of the increased consumption and the increase in population.

We have passed the boom period with its inflated land values and the industry is today on a firm foundation. The speculators and the victims have left the field to the conservative growers. One thing stands out very clearly, namely, that the real fruit growers have always made money, both during a period of boom and a period of depression, and with the stabilization of the industry, they will probably become more prosperous.

So much has been said and written about diversification as a safety factor in farming, that one is apt to conclude that diversification in the fruit industry is also neces-

sary to safety. This is true insofar as the growing of different kinds of fruit is concerned and diversification of this kind should be encouraged; but mixing general farming, stock raising or vegetable growing with fruit production is not and cannot be made a success. It has generally resulted in failures whenever attempted. In farming, one deals with mass production; in fruit growing, one deals with the individual. The farmer does not and cannot consider an individual wheat or corn plant, but in fruit production, it is the individual tree that makes for success or failure. Then too, farming operations interfere with orchard work and the farmer will invariably take care of his farm crops first. It should not be understood that every acre on the fruit farm should be planted to fruit trees. There should always be land enough to supply feed for stock, at least one cow, together with what vegetables are needed to supply the family table.

EXPERIMENT STATION AID.—In the development of the fruit industry in Colorado many problems have arisen because of a new country and new conditions, and these problems have, in the main, been solved through the efforts of the horticultural department of the Experiment Station. Questions of pruning, thinning, cultivation, fertilization and cover crops have been studied and worked out. A demonstration orchard is maintained at Austin in Delta County, where various problems of fruit growers are studied and demonstrations given showing how to solve these problems. Trained men have been kept constantly in the field to aid the growers when problems beyond their knowledge arise. The department has made a complete survey of the fruit industry of the state and every commercial orchard in the state is card-indexed, together with information about soil conditions, varieties grown and other matters of interest. With this information, many questions can be intelligently answered without a personal visit to the orchard.

SMALL FRUITS.—The small fruit industry is mainly limited to local demand and, at least, to local markets. Considerable quantities of gooseberries are grown for canning purposes. The canning industry gives promise of development, particularly in districts of small land holdings. At present the small fruit industry is most highly developed in the vicinity of Denver, which affords an excellent market for considerable acreage. It is also well developed in Larimer County, which is the center of the raspberry growing industry.

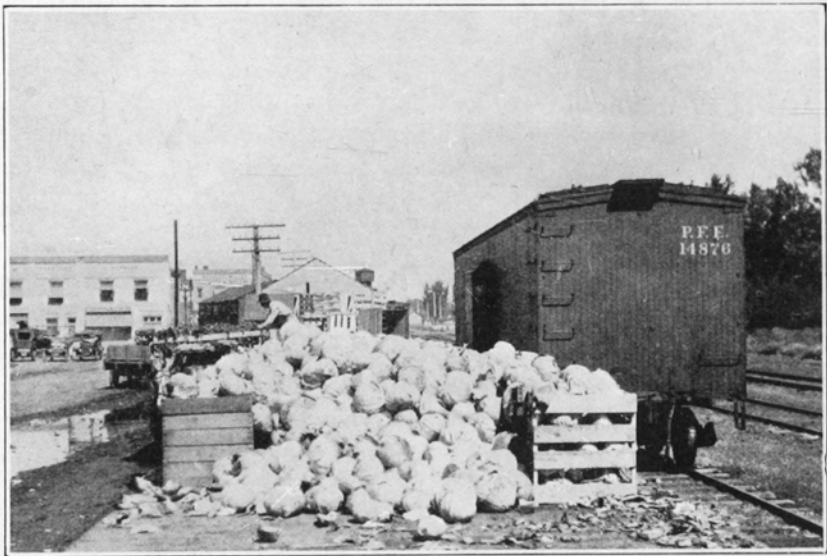
GRAPE GROWING REVIVED.—Grape growing is new in the state, but results from small plantings in the Arkansas Valley on the Western Slope show conclusively that grapes can be grown satisfactorily in Colorado. Grapes were tried in pioneer days, but the vineyards were short lived. Experimental plantings of grapes on the college experimental farm at Austin in Delta County indicate that grape growing will, in the near future, become an important industry. During the last three years several hundred acres have been planted to grapes and additions to this planting are constantly being made. While the American varieties are undoubtedly leading,

because of their hardiness and greater ease in handling, the European grapes are proving successful in certain favorable localities, though they require winter protection.

VEGETABLE GROWING INDUSTRY

Ten years ago practically no carload shipments of fresh vegetables were made to out-of-state points. Today the annual shipment of fresh vegetables to other states amounts to over 16,000 carloads. Colorado vegetables come on the market when vegetables in the South and East have passed their prime, and thus there is less competition. Even with the high freight rates, the growers are making a handsome profit.

While watermelons, cantaloupes, onions and cabbage form the largest share of the out-of-state shipment, over 5,000 carloads of head lettuce are annually shipped out of the state and approximately 2,000 carloads of



Loading cabbage at Brighton.

mixed vegetables. Approximately 3,500 carloads of cabbage are shipped annually. The cabbage is grown mainly in the Platte Valley.

ONION PRODUCTION LARGE.—Colorado is one of the leading onion producing states in the Union. The annual production varies from 1,200 to 1,800 carloads. This industry is capable of considerable expansion, both on the eastern and western slopes of the mountains. The quality of Colorado

grown onions cannot be excelled. The principal variety raised is the "Yellow Danver." The yields obtained by onion growers are almost unbelievable, at least to the eastern grower. A yield of seven to eight hundred bushels to the acre is not unusual. The average per acre is higher than in any state in the Union.

The rapid expansion of the vegetable industry has brought out many problems, both in the matter of cultural methods, insect pests and diseases. In the solution of these problems the State Experiment Station is devoting considerable time and money.

The canning industry in Colorado is, as yet, in its infancy. Tomatoes, peas, cucumbers and cherries are the main canning crops. The annual value of the tomato pack is over a million and a half dollars. The pea-canning industry is confined principally to northern Colorado and the output is over a half million dollars per year. The pickling of cucumbers is an important industry on the eastern slope of the mountains, and this industry alone amounts to over a half million dollars. The cherry-canning industry is estimated at from \$500,000 to \$600,000 annually.

The development of horticultural production during the last decade has been phenomenal. This growth, while rapid, has not been in the nature of a boom. It has been a steady growth in response to an increased market demand for Colorado-grown products. Geographically, Colorado is well located with reference to the large markets southeast and south.

A FORTY MILLION DOLLAR INDUSTRY.—The total yearly shipment of horticultural products for the state is slightly over 36,000 car loads and the total value of all products sold is close to \$40,000,000. These impressive figures give a fair idea of the industry as a whole and they are also an indication of its future possibilities.

HOW HEAD LETTUCE DEVELOPED

HIGH ALTITUDE FARMING.—Colorado's peculiar climatic features, coupled with problems of altitude and irregular topography, brought early development of what has become known as high altitude farming, which, broadly defined, means crop production at elevations of 7,000 to 9,500 feet. At these elevations the period free from killing frosts is short. In many respects the climatic conditions as they relate to agriculture in high altitudes are comparable to those which make farming precarious in high latitudes. Even so short a period as 60 days between the average killing frost of spring and fall is sufficient in the mountain regions of Colorado for successful agriculture with certain adaptable crops.

In many cases success is due to modifications of climate, influenced by protective mountain ranges, heavily forested surroundings, readily avail-

able and ample moisture during the growing season, a heavy snow covering in winter and intensity of sunlight as an effective agent for rapid maturity of plants. Nevertheless, high altitude farming is fraught with difficulties of which the farmer near sea level has no conception.

Here again, as in respect to other branches of agriculture, mining was the incentive for development. The miner recognized no climatic limitations. He went everywhere, high and low; into the depths of gorges as on the mountain tops, in search of precious metals. Wherever he made a strike rich enough to draw attention, there a mining camp came into being.

Early discoveries were within a few miles of the plains, but every season when the snow went off prospectors penetrated farther into the fastnesses of the Rockies, establishing new settlements without regard, for the moment, as to how these were to be supported. Tradesmen followed the prospector and miner, and the farmer came also.



Head lettuce at 8,200 feet in Conejos County.

SUPPLIED THE MINERS.—Among the earliest records of high altitude farming is that relating to Captain Joseph F. Hall and Banter and Eicher, whose ranches were located about two miles from Central City and a half mile beyond Russell Gulch. Fifty acres were fenced and under cultivation on these farms in 1862. About a third of this acreage was in potatoes and there were also other garden crops including onions, cabbage, turnips and lettuce, as well as two acres of barley. The altitude was over 9,000 feet.

From Mrs. Mayme G. Sturm of Glen Arbor at Empire, Colorado, comes information about the farming experiences of the Lindstrom family on Mad Creek, a fork of Clear Creek. Lindstrom came to the Clear Creek Valley as a prospector in 1860, locating finally near Empire. His family

followed in May, 1862. Mrs. Lindstrom brought vegetable seeds from Illinois. A small clearing south of the log road opposite their cabin was spaded up and planted to vegetables.

CABBAGE \$5 A HEAD.—The idea of trying to raise vegetables at that altitude was ridiculed by loggers and prospectors alike. However, Mrs. Lindstrom was successful in growing potatoes, turnips, rutabagas, lettuce and radishes. Each succeeding year the garden produced more in quantity and variety and the Lindstrom cabin soon became the mecca of the prospectors seeking fresh vegetables. A head of cabbage in winter brought \$5, a large onion \$1.

Hay for the oxen and the few horses used at the Lindstrom saw mill was obtained by cutting the wild grass in willow bottoms along Clear Creek, by the laborious method of mowing with a scythe. A hay press was put up by Paul Lindstrom on the Frazer River. The hay was baled and carried over the Indian trail across the main range on pack mules. This trail took practically the route of Berthoud Pass.

These experiences of pioneer high altitude farming could be repeated from every mining camp established in the higher regions. After the rush of prospectors was well under way there would invariably be one or more garden patches started, often by the people who opened the hotel or boarding house for the camp. In this way many ranches, still operated as mountain resorts, got their start. After the camp dwindled these pioneer farmers remained to develop the properties as cattle ranches, continuing the growing of garden vegetables and such grains as would furnish hay for the stock as winter feed.

It was by this process that it became common knowledge that high altitude vegetables had a peculiarly fine flavor and quality, due to the conditions of growth. While vegetables have been grown from the earliest period of development in the mountains, it is only of recent years that the business has assumed commercial importance. The head lettuce industry has shown remarkable development since 1918, when the first carlot shipment was made.

ISABEL STARTS HEAD LETTUCE

G. D. Isabel was the first commercial grower in carlots. In 1918 he rented ten acres on the Burleson farm at Buena Vista and in the early fall of that year he shipped the first carlot. His returns on the ten acres that year approximated \$7,000. While Isabel was the first large commercial grower, credit for developing the carlot market for Colorado high altitude lettuce is given to Elmer Hartner of the Hartner Produce Company, Denver, who shipped the first car to the Atlantic seaboard in 1920. The carlot

produced in 1918 by Isabel was absorbed by Colorado markets, as were seven cars grown in 1919, but by that time there had been such expansion that outside markets had to be found for the product.

Co-operative marketing of a considerable portion of the crop has been found successful. The Colorado Co-operative Lettuce Growers' Association was organized in 1921 at Buena Vista, and this association is in flourishing condition, handling not only head lettuce but also peas and cauliflower through the packing sheds at Buena Vista and other loading points, and shipping the product to the leading consuming markets of the East. The industry is being standardized, government inspection is provided for every shipment sent out by the Co-operative Association and by all of the large individual growers, and in a short period of six or seven years the industry has grown into the million dollar class from nothing.

COLORADO RANKS SECOND.—In 1924 the head lettuce acreage was 5,600, the total production 476,000 crates, and the value of the crop to the grower, \$975,000. In 1925 the acreage was 10,500 acres, the production 1,396,000 crates and the value to the grower \$2,150,000. Colorado that season ranked second in the United States for lettuce production. The figures are from the Colorado State Year Book. These figures do not include other high altitude vegetable crops, namely cauliflower, peas and spinach. The counties from which the production comes are Eagle, Chaffee, Park, Teller, Fremont, Custer, Saguache, Rio Grande, Alamosa, Costilla, Conejos, Grand, Summit, Routt, Jackson and Garfield, with a scattering from several counties that lie only partly in the mountains.

THE MELON INDUSTRY

SWINK STARTED IT.—There is no doubt about the fact that George W. Swink did more than any other individual to start the cantaloupe industry in the Arkansas Valley and that the Rocky Ford cantaloupe owes its nation-wide fame to Swink's energetic and well-directed public spirit. This pioneer left as a permanent legacy to the Arkansas Valley an industry in which Colorado ranks second in the United States and he was instrumental, also, in inducing farmers to grow sugar beets and capitalists to invest in sugar factories. He established an agricultural festival known as Melon Day and laid the foundation for the Otero County fair. These accomplishments are mentioned in detail elsewhere in this volume.

As to cantaloupes, Swink's efforts were not only directed toward growing them in marketable quantity, but he gave much attention to the development of quality, though in this line his experiments were less resultful than those undertaken by men of scientific training. Swink never claimed

to be more than a progressive farmer, though he proved himself to possess the qualities of a state builder to an unusual degree. By his public spirit he inspired others of less initiative and more technical knowledge to put their talents to use in the development of the lines of agriculture which Swink, in his determined way, fostered and fathered.

Swink got seed from numerous sources and tried out many varieties of muskmelons and cantaloupes before he was satisfied that he had found one that would serve as a commercial product in the Arkansas Valley. Among others from whom he obtained seed was Henry J. Gardner, ex-governor of Massachusetts. While it has been said that the seed furnished by Gardner was used as the foundation for establishment of the industry, his contribution, which included both muskmelons and watermelons, was only one of many.

SEED FROM MASSACHUSETTS.—Herbert Gardner of Colorado Springs, a son of the ex-governor, says his father sent Swink some melon seeds in 1872. It was in that year that Gardner started ranching in the Huerfano Valley, the town of Gardner being named after his family. Shortly afterwards he went to Rocky Ford, where he met Swink, with whom he had become acquainted previously in Missouri.

Gardner and Swink spent several weeks together in Swink's cabin. Old times back east were discussed.

"Are you perfectly happy in Colorado?" Gardner inquired of his friend.*

"Yes, I suppose so," Swink replied. "But I do wish I had some watermelon and cantaloupe seeds. I miss the melons terribly."

Gardner assured his companion he would get a supply of seed. He wrote to his father, Henry J. Gardner, who had been governor of the Bay State, 1855-58, and who was then living in Boston. Six weeks later Herbert Gardner got word from Swink that watermelon and cantaloupe seed had been received by him from Boston.

Years later Herbert Gardner was living at a hotel on Broadway, New York. One day the waiter at his table asked him to try a Rocky Ford melon. It was so delicious that he made inquiry as to its origin and learned that it had been shipped east from Rocky Ford, Colorado. He concluded that this melon probably traced its ancestry back to the seed furnished Swink by the elder Gardner.

SWINK'S WORK IN DETAIL.—In the following paragraphs is summarized the information obtained from members of the Swink family at Rocky Ford in regard to Senator Swink's efforts in the development of melon growing.

*From an account in the Boston Globe of December 24, 1922.

In the spring of 1875 Swink began experimenting with the raising of agricultural crops, principally grains and vegetables, to ascertain what would do the best. He had been told that it was impossible to raise anything successfully in the Arkansas Valley, but much to his surprise practically everything planted gave an exceptional production, particularly the vine crops.

In 1877 he determined to make watermelons and cantaloupes his principal crops and began the development of what in 1904 was known as the Rocky Ford netted gem cantaloupe.

The principal difficulty in the early development of the cantaloupes was found to be inability to properly pollinate the fruit, and it was found that while the cantaloupe would set, it would not remain on the vine until the appearance of the ground bee. He then brought in the honey bee and upon the introduction of the bee found that cantaloupes would be produced two weeks earlier.

In 1877 he planted about one-quarter of an acre of watermelons, which produced all that could be sold in the local market that year. The local demand increased, and from time to time the acreage was increased.

Up to the year 1886 Senator Swink produced all of the melons of both kinds that were raised in that part of the country, and during that year he commenced to introduce cantaloupes in the eastern markets. The first two years the shipping was a failure financially, as the proceeds were not sufficient to pay the express charges.

Shortly afterwards the better hotels and restaurants began to call for Rocky Ford cantaloupes and they were shipped in carload lots to Kansas City and St. Louis.

In 1897 one hundred crates were shipped to London, where they sold readily at \$4 a crate.

MANY YARNS WERE INVENTED.—Because of his prominence in development work in the Arkansas Valley, Senator Swink's name was kept before the people constantly by the newspapers and many yarns became current regarding the manner in which the melon industry had developed. Among other things he was said to have produced the Rocky Ford cantaloupe by crossing the pomegranate with a muskmelon. Again, it was said that he had developed the "Seedless Watermelon, Humanity's Latest Boon." Both "achievements" were merely newspaper yarns for which the senator was not responsible. He was a serious-minded man, and usually achieved what he set out to do in a practical way.

Other farmers in the Arkansas Valley have done their share in the improvement of the cantaloupe and in the development of the honey dew,

casaba and other varieties of winter melons, upon which much might be written.

The story of the development of the vine seed industry is another achievement, largely the result of the work of practical farmers, which must be dismissed here with a mention, because of the limitations of time and space put upon the authors of this volume. The Arkansas Valley produces 95 per cent of all the cantaloupe seed grown in America and a large share of the watermelon seed.

What the State Experiment Station has done in protecting the melon industry is told in the chapter devoted to agricultural experimentation, in an account of the work at the Rocky Ford field station.

In 1925 the total cantaloupe acreage in the state was 8,140, of which Otero County had 4,143 acres, Crowley 2,289, Bent 1,062, Pueblo 245, the other counties reporting commercial acreage being Weld, Pueblo, Mesa and Adams. Otero County had 885 acres of honey dew melons, Crowley 594, Bent 79 and Pueblo County 50. Cantaloupes grown for seed are mostly in Otero County, with an acreage of 990, Pueblo County being next in seed with 340 acres and Crowley third with 110 acres.

In 1925 Colorado produced 1,604,000 crates of cantaloupes and honey dew melons valued at \$1,315,000, giving the state second rank among all states in total production of these crops, as has been mentioned elsewhere in this volume.



Outlet of the Gunnison Tunnel.

CHAPTER XIII

United States Reclamation Projects

THE GUNNISON TUNNEL.—Engineering science applied to the problem of irrigation has nowhere resulted in a more unique and successful diversion of waters than on the Uncompahgre Reclamation Project in western Colorado. The Gunnison Tunnel, measuring approximately six miles, is the longest irrigation tunnel in the world.* Its construction, at a cost of three million dollars, involved spectacular features that drew world-wide attention. Through this tunnel the waters of the Gunnison River are carried into the Uncompahgre Basin, the connecting canal being 12 miles in length. The history of this, the first of all United States reclamation projects to be undertaken, has been marked by controversies between the government and the settlers over cost of construction, which exceeded all original estimates, yet the fact remains that the water diverted from the Gunnison River to the Uncompahgre, saved the settlers from absolute ruin and resulted in the building of a community, comprising substantial towns and highly productive farms and commercial orchards that each year show increasing evidences of wealth and contentment.

A FARMER'S DREAM.—That a farmer's dream started the train of circumstances which eventuated in the construction of the Gunnison Tunnel and its attendant system of canals, is vouched for by people at Montrose, to whom the dream was told by the dreamer, F. C. Lauzon. That Lauzon conceived the idea of bringing the waters of the Gunnison through a mountain range into the valley of the Uncompahgre is undisputed. Lauzon had been a miner and he was familiar with mountain tunnels. He told the people of Montrose that the idea first came to him in a dream. However that may be, he talked it so effectively that he succeeded in interesting citi-

*While the Gunnison is the longest tunnel in the world through which water is conveyed for irrigation, it is now outclassed in length as a water carrier by New York City's latest bore, the Shandaken tunnel, which is 18 miles long. This carries water for domestic uses and is part of the Gilboa dam system, that dam reversing the direction of the Schoharie River. These additions to New York's water supply system have cost \$182,000,000. Completion was announced in July, 1926. While not comparable in cost, purpose or other features to the Gunnison tunnel, there is interest in contrasting the two engineering works. The Gunnison tunnel was built to carry water to grow food; the Shandaken tunnel to slake the thirst of millions huddled on Manhattan Island and environs. The one creates new wealth; the other results from the dire necessities of over-crowding population on limited areas.

zens in putting up cash for an investigation as to the feasibility of the project. It was through this agitation of the subject in the Uncompahgre Valley that the attention of the Federal Government was obtained and the project finally carried out by the Reclamation Service.

The first written records that mention the Uncompahgre Valley are those of Captain J. W. Gunnison, who in 1853 led an exploration party commissioned by the Secretary of War to locate a suitable route for a railroad across the Rocky Mountains. The report on the valley indicated that it was a desert unfit for cultivation and habitable only by savages. In those days a sagebrush plain, or a series of mesas, covered with sagebrush and cedars, looked forbidding when considered as to agricultural possibilities.

UTE AGENCY IRRIGATION.—The first irrigation from the Uncompahgre River of which there is any record was in 1875, with the establishment of the Ute Indian Agency nine miles south of the present town of Montrose. A ditch was used to water crops grown on the agency land. In the fall of 1881 the Utes were moved out of western Colorado into Utah and white settlement began. With completion of the Denver & Rio Grande through the center of the valley in 1882, there came a rush of homesteaders. Ditches of considerable size were then built and the supposition was that there would be ample water from the Uncompahgre River to cover the irrigable lands of the entire valley. It was soon realized, however, that additional supplies would have to be developed. Lauzon first began to "talk tunnel" in 1890. It took him several years to arouse enough public interest to secure funds to pay for making a survey. In August and September of 1894 Walter Fleming of Montrose and Richard Winnerah of Ouray ran levels from the Uncompahgre Valley to the Gunnison and found that Gunnison water could be made to cover practically all of the valley in Montrose and Delta counties. While their report established the feasibility of securing an additional water supply, it demonstrated also that the cost would be far greater than the people of the Uncompahgre Valley could afford.

FORCED TO ABANDON FARMS.—While about 100,000 acres had been taken up and patented, less than 30,000 acres were under cultivation and often there was not sufficient water even for that area. Foreclosures had been made on about 20,000 acres, the land being then in the possession of loan companies. Many entrymen, after getting their patents, were forced to abandon their farms for lack of water.

These conditions and the fact that diversion from the Gunnison seemed feasible, resulted in an appeal for state aid. Meade Hammond of Paonia, representing the Montrose District in the legislature, and Representative

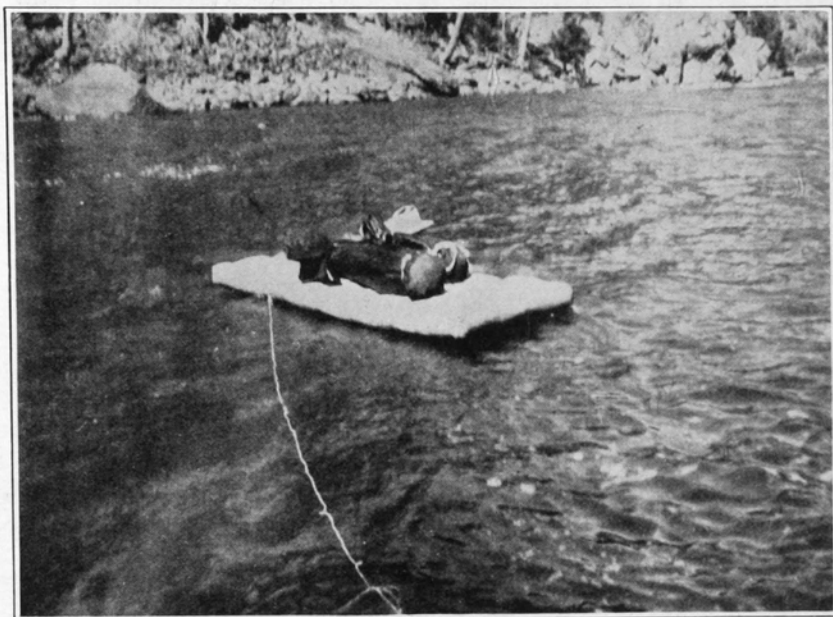
C. T. Rawalt of Gunnison County succeeded in putting through a measure appropriating \$25,000 for starting work on a tunnel. This was accomplished through a legislative trade, which carried with it appropriations for establishment of the Gunnison Normal (now Western State College) and State Canal Number 1 at Canon City. The Gunnison project was known as State Canal Number 3. The act became effective April 11, 1901, and the governor appointed Meade Hammond, John J. Tobin and Frank E. Dodge as a board of control to carry out the provisions of the law.

THE STATE STARTS WORK.—Although the appropriation was small, the commission decided to begin work in December, 1901, by adopting the results of the surveys thus far made by A. Lincoln Fellows for the U. S. Geological Survey. Work continued until the money gave out, which was in the fall of 1902. At that time 900 feet of tunnel had been driven. No further work was done by the state, as the government was preparing to take over the project. The legislature, on March 16, 1903, passed an act transferring all property rights in State Canal Number 3, together with the uncompleted tunnel, to the Federal Government. This transfer was not accomplished until August 14, 1906, though in the meantime the Reclamation Act had been passed and the Uncompahgre project approved.

This project was one of several recommended by A. Lincoln Fellows for reclamation work in Colorado. The others were the Grand Valley, which is under construction, the White-Yampa River project, and a fourth, as an alternative. Mr. Fellows at that time was resident hydrographer for the U. S. Geological Survey and his chief was Mr. F. H. Newell. Fellows had been in Colorado since 1887 and not only was familiar with the question of water diversion, but had assisted in carrying out such a project through private capital, taking the waters of the Rio Dolores into the Montezuma Valley in southwest Colorado. On Fellows' recommendation late in 1900 Chief Newell authorized him to proceed with work on the Uncompahgre project, which included a topographic survey of the dividing ridge between the two valleys and exploration of Gunnison Canon. The account of this exploration furnishes one of the most thrilling chapters in the engineering annals of America.

AN IMPASSABLE GORGE.—The gorge of the Gunnison from the mouth of the Cimarron down stream about forty miles, is impassable. Its walls are approximately two thousand feet high and for long distances cannot be scaled. It has been penetrated its entire length by only two men, A. Lincoln Fellows and W. W. Torrence, who performed the feat in 1901 because it was an engineering necessity and not from mere love of adventure or desire for fame.

EXPLORATION WAS NECESSARY.—Reasons for the exploration were these: While it was definitely known that the Gunnison River was high enough to make it possible to turn its waters into the Uncompahgre Valley, the location of the tunnel had by no means been determined. So far as then known, the best location might have been almost anywhere through Vernal Mesa, starting at any point within a distance of ten or fifteen miles.



Pneumatic mattress carrying outfit of the explorers. One man is swimming ahead.

This course had to be carefully surveyed and Fellows' exploration was preliminary to the making of that survey. The questions to be answered were in part: Is it possible to make the survey and, if so, how shall we go about making it? What is the nature of the rock and the geological formation, generally? Can the surveying party depend to any considerable extent upon fish and game? Is it possible to use a boat to any advantage? What camping sites are there? Upon the conditions found the plans for the survey must depend.

EXPLORATION OF THE CANON

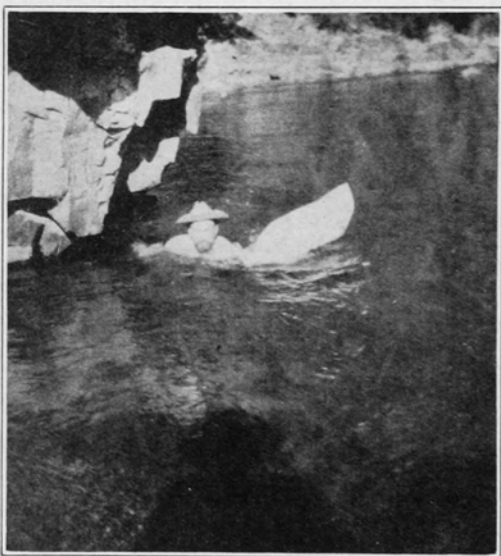
Mr. Fellows' own story of the exploration will serve the purposes of history:

It was my good fortune to have charge of the government hydrographic work in the State of Colorado at that time and the general direction of the survey, which was made

in the summer of 1901, was turned over to me. From the very commencement of the survey I felt that it would be necessary before its conclusion to make an exploration in detail of the Grand Canon of the Gunnison which was generally supposed to be impassable. Other parties had tried in vain to explore the gloomy recesses of the canon. Efforts had been made in the winter time to pass through on the ice, but had failed on account of the existence of falls and rapids where no ice could form and these expeditions had been given up. Surveying parties had attempted to go through it with complete outfits but had failed and had given up the efforts after losing their equipment and had painfully worked their way out over the rim of the canon before the most inaccessible points had been reached. In the year 1900, a party of five residents of the Uncompahgre Valley, under the leadership of John E. Pelton of Montrose, had made the best planned and boldest attempt yet undertaken to force their way through the gloomy passages, but after traversing about half the distance, that is to say about twenty miles out of a total of about forty, and after losing one boat and a large part of their supplies, they were forced to abandon their remaining boat and return to their homes by a most toilsome and perilous detour of more than a hundred miles. The veteran old trapper and hunter of that region, Moccasin Bill, offered the encouraging ultimatum that it was impossible for mortal man to go through the canon and live, that he himself had been about half way through and he knew no man could go farther.

It was under these far from encouraging conditions and with the prophecy heard from all sources that I would be killed if I undertook the trip, that I made up my mind to at least make the effort. Born and brought up on the Atlantic sea coast and always fond of swimming, I concluded that the most feasible way to make the trip was to go

as lightly loaded as possible, carrying only the most essential instruments and supplies, the most important part of which was a pneumatic mattress to be used as a raft for carrying the equipment, incased in rubber bags by day, and as a bed to interpose between the bodies of myself and companion and the sharp rocks along our course at night. I required one assistant and in selecting him I made these conditions: First, he must be a good swimmer; strong and athletic; second, he must be unmarried and have no one entirely dependent upon him; third, he must be strictly temperate and a good companion and at all times ready to obey orders; fourth, he must offer his own services unsolicited by me. There were many applications, but from them all I selected a man whom I had all along hoped would offer his services, William W. Torrence of Montrose, about thirty years of age, who had been a member of the



A. L. Fellows swimming down the Gunnison.

Pelton party during the expedition of the preceding year and fully understood the difficulties and dangers that had to be surmounted.

In the meantime, during the two months of surveying, I had never lost an opportunity to study the canon from the top and of finding ways of getting down into it. I selected three places in the ten most dangerous miles of the canon, where a man could go down with supplies. I gave directions to one of my most faithful assistants and friends, A. W. Dillon, of Montrose, to convey supplies of food to these three

points, waiting at each one in turn until we should have arrived, or until there was no longer hope that we would ever arrive. These orders were faithfully followed and it was largely due to the devoted assistance of this man that the exploration was a success.

JOURNEY BEGINS AUG. 12, 1901.—Exploration was actually commenced August 12, 1901. At the head of the Grand Canon of the Gunnison is the mouth of the Cimarron River. The Denver and Rio Grande Railroad comes out of the Black Canon of the Gunnison to this point, then climbing out of the canon by way of the Cimarron and one of its tributaries. It was at this point that our toilsome journey was commenced. The conductor kindly stopped the train upon the exact spot where I told him we wished to get off. Turning immediately down the canon, we started upon our perilous journey. The packs on our shoulders were not light, although we had limited their size as much as we could. It was frequently necessary to wade through deep water, even when we were obliged to swim, and all walking was along boulders which formed the talus of the canon walls. Easy walking was never to be found unless it was a very few feet upon some gravel bar. We would proceed along one side of the river until we came to a point where it was absolutely necessary either to cross, or to swim for some distance out into the stream, making as rapid progress as we could.

Our surroundings were of the wildest possible description. The roar of the water falls was constantly in our ears and the walls of the canon towering half mile in height above us, were seemingly vertical. Occasionally a rock would fall from one side or the other, with a roar and crash, exploding like a ton of dynamite when it struck bottom, making us think our last day had come. At times the canon would become so narrow that it would almost, but never quite, be possible to step across the river. At times, great gorges of rock that had fallen in from the sides would hem in the water to such an extent that it would be nearly concealed. On the second day of our trip we were so unfortunate as to get into a veritable cul-de-sac from which it took us the entire afternoon to extricate ourselves, camping that night just across the river from where we had eaten our lunch at noon. Our most dangerous work, possibly, was that of clambering along the sides of precipices, traversing old mountain sheep trails, at points where it was impracticable to swim without too great danger to life and limb.

NEW SUPPLIES BROUGHT DOWN.—Upon one of these occasions I was so unlucky as to fall about 20 feet, but so fortunate, if it might be so called, as to land in a bed of wild gooseberry bushes, which kept me from breaking any bones, but had other unpleasant features. Naturally, one gets tired after springing like a mountain goat from one rock to another and swimming whirlpools and rapids, and when the rocks are sharp, as they usually are, they are hard upon shoes. On the third day when we arrived along toward evening at the mouth of Trail Gulch, where Dillon was first to meet us, we were more than glad of a chance to rest and to send to Montrose for new shoes and fresh supplies. We remained at this point two nights and one whole day, sleeping nearly all of the time.

On the morning of the 16th, we started out once more, bidding farewell to Dillon. I availed myself of the opportunity to send out my rolls of films, containing the photographs taken thus far, together with my notes, in order that they at least might be saved.

The canon, heretofore comparatively open with walls having slopes of about 1 to 1 and covered with spruce and pine timber, with here and there groves of aspen and an undergrowth of oak brush, now became more and more rugged. The geological formation was of gneiss and mica schist and the apparently vertical cliffs, instead of being met with occasionally, now became almost continuous. At times we would traverse along reaches looking like mill ponds with the sky and canon walls reflected in the depth of the blue water, but again we would come to rapids and water falls as turbulent as the waters of Lodore. The canon walls appeared more and more to be hemming us in from the outer world. One remarkable point which we passed on the 16th, I called the Giant Stairway. The walls looked almost as if cut into enormous steps by some Titan of old, while statues, turrets and pinnacles adorned the rugged precipices on either side. Leaning out a little from one of the Giant steps was a long, thin rock like a needle, apparently not more than two or three feet in thickness and apparently over 150 feet in height, entirely detached from the cliff excepting at its base. It seemed extraordinary that it could so hold its position for centuries as it had apparently done. That evening we reached a point which we named Beaver Camp,

from the fact that a colony of beaver had lived there at no distant date and had cut down some of the great trees growing in the little flat which formed a delightful camping ground where we stopped for the night.

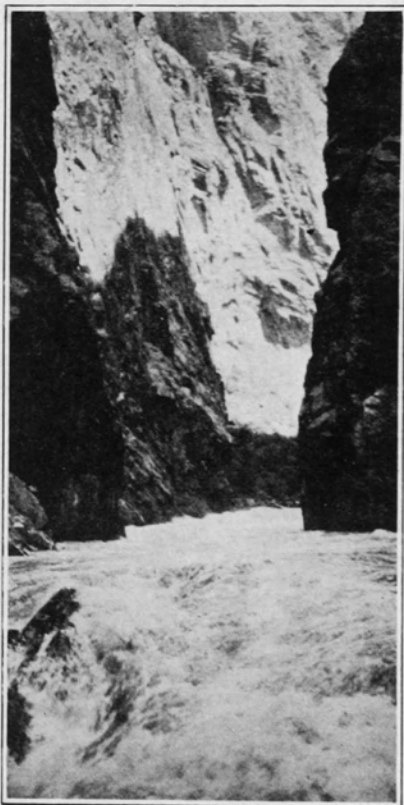
On the morning of the 17th, we again started out upon what we expected would be the most perilous portion of our journey. Others had been as far as this point and escaped with their lives, but no one had ever gone far beyond. We had made good time the preceding day and were farther along than I had expected, so I thought it best to make great bonfires of the huge piles of driftwood which lined the stream, to indicate to Dillon above that we had passed this point. We made an early start, for we expected the day would be a hard one, and about 11 o'clock that morning we reached what had hitherto been the Ultima Thule of other explorers. Legends existed of a party which many years before had attempted to pass through the jaws of the canon which now appeared to be closing in upon us. The legend runs that they lost their entire outfit, with one of their party, and being unable to retrace their steps, had, with the uttermost difficulty, scaled the sides of the canon. Pelton's party, too, had reached this point with their second boat and we found a piece of the rope still fastened to the rocks and some of the provisions and supplies left by them. They, too, had abandoned everything and climbed out of the canon, glad to escape with their lives. Their leader had told me that it was impossible for a man to pass through the gorge and live.

LIKE THE JAWS OF DEATH.—When about noon, we reached the lowest point attained by earlier explorers and saw before us the mighty jaws, past which there was to be no escape, I believe I might be pardoned for the feeling of nervousness and dread which came over me for the first time. It was not so much for myself that I feared, but because I was leading another man into a place from which there might be no escape. Right then I made the only discouraging speech that was made during the entire trip. I said to Torrence:

"Will, your last chance to go out is to the right. You can make it there if you wish, but if we cross the river at this point there can be no return, we must go on. I do not ask you to go, but leave the decision entirely to yourself. As for me, I am going through."

Torrence said: "Here goes nothing!" And he commenced to pull off his coat.

Nothing further was said. We swam the river, reaching a similar point of rocks on the other side, but still above the gorge. And, lo, we beheld as a beacon of hope through the narrow opening, where the water was of unknown depth and velocity, and below which it was believed there were high falls, a bonfire kindled by Dillon on a huge rock below the jaws of the canon. He had come down by a most precipitous path, risking life and limb for our encouragement. The very sight of this man in the jaws of the gorge was a wonderful inspiration. Again we plunged into the foaming water and in a few minutes we had passed through the jaws of the gorge and were safe among the enormous boulders below.



Giant Gorge. Rock walls and rushing waters.

Here we lunched heartily upon provisions brought by Dillon and then we were once more on our way. Another gorge was below, apparently more dangerous than the preceding one, with a longer and, worse still, for the most part invisible distance to traverse by swimming. This, too, was safely passed at last and we resumed our tiresome journey along the canon side.

We were soon obliged to cross the river again, where we clambered along gigantic boulders, often as large as a good sized house, the peculiar characteristic of which was that the nearer the water the larger and more impassable the boulders seemed to be. In consequence, we kept ascending the side of the talus until, when darkness fell, we were a long way above the water, and we made camp under a huge shelving rock against which the roaring of the river reverberated and echoed like demons howling over their prey. We were so far above the water that it took an hour to make a trip down for a coffee pot full, the distance being augmented by the difficulties in climbing.

SIX HOURS FOR ONE-FOURTH MILE.—On the morning of the 18th, we hoped that our greatest difficulties were passed, but we were doomed to disappointment, for on that day we encountered some of the most trying experiences of the trip. At the very start we came to a gorge where gigantic boulders had fallen in from the cliffs, the water flowing 100 feet or more beneath these boulders. They were packed closely enough, however, so that they formed a dam in high water. The boulders were smooth and polished to such an extent that it was only with the greatest difficulty they could be surmounted. It took us six hours to traverse less than a quarter of a mile. At times it would be necessary for one of us to climb upon the shoulders of the other, clamber to the top of some huge rock and draw our supplies and the other man up by means of the rope which we carried with us. Again on the other side there might be a deep pool where we were obliged to swim, into which the water boiled from the caves above and was sucked out again through the crevices between the boulders below. In one of these pools I was drawn completely under water in an eddy. I fully expected to be drawn down into the crevices of the rocks below, but by dint of the hardest kind of swimming, succeeded in getting into still water. At this time, Torrence felt that he would never see me again.

CAUGHT A MOUNTAIN SHEEP.—All things have an end, however, and about 1 or 2 o'clock we passed this gorge and emerged to where the canon opened out to a slight degree. Here we met an experience most unusual to hunters or explorers. To appreciate the situation the reader must understand that we were now out of provisions, having lost or spoiled those with which we had been supplied. We were hungry, sick and exhausted and were losing flesh, as we had through the entire trip, at the rate of about two pounds a day. At this critical stage, while climbing along the side of the canon thirty or forty feet above the stream, I stepped out from behind a large rock to a spot where there were some small bushes. As I forced my way through these bushes, up sprang two mountain sheep which apparently had been lying asleep and which I had come within three feet of stepping upon. One of them was so dazed that it sprang over the cliff and broke its shoulders upon the rocks below. It was hard on the poor sheep, but I could easily understand why it had been so frightened, when I saw the reflection of myself in a mirror after we had once more reached civilization. Although hard on the sheep, it was our salvation. Though the game laws of Colorado forbade one having any portion of a mountain sheep in possession, a hind quarter was immediately added to our supply and a goodly portion cooked and eaten.

Soon after this we came to what, in my opinion, is the most beautiful part of the entire canon. The river pitches down over a succession of falls which I named in honor of my companion, Torrence Falls. At the foot of this cataract is a beautiful little grove of cottonwood trees and there we found shelter from the rain that was falling, building a fire and making ourselves as comfortable as possible. We were compelled to move on soon and so until dark trudged along through the rain, crossing the river a number of times in the hope that we might be able to reach the mouth of Red Rock Canon, where we expected Dillon to meet us again. In this, however, we were disappointed and darkness came upon us when we were still a mile above the longed-for spot. We camped for the night under the sheltering cliffs, putting up our rubber sacks to keep off the rain, and making an enormous fire out of driftwood.

SWIMMING IN ICE WATER.—On the morning of the 19th it was still raining and the first thing we had to do was to swim the river. We found it bad enough to swim the ice cold water when the sun was shining, but when rain was falling and everything gloomy, it was far more disagreeable and trying. At about 10 o'clock, without having encountered any very serious difficulties, we came to where Dillon was waiting for us. He had come up the river about three quarters of a mile and met us and I was glad, indeed, to turn my pack over to him for a time. By noon we were at the camp which he had made at the mouth of Red Rock Canon and he was soon busily engaged in cooking us a good dinner. It rained all that afternoon and was still cloudy the next morning. We were seriously tempted to leave the canon, for we had passed through all the most important part of it and I hardly expected to be able to obtain any information of value below. But the fever was upon us and we thought it would be a great pity when we were so fully equipped not to go entirely through the canon, and moreover there were still some doubtful points that needed to be cleared up.

Accordingly, on the following morning, we started out once more, this time without our packs, except a luncheon, as I intended to go down stream rapidly as possible, hoping to be able to reach a ranch house which I thought was some eight miles below. In this we were disappointed as the distance proved to be considerably greater. We traversed 8 or 10 miles and it was the hardest day's trip that we had as yet endured. At night we camped without bedding and without food or water upon a bleak hillside. Having passed through all of the canon that was of any interest to us and having reached a horse trail, we decided we had gone far enough and directed our course toward Delta. We arrived there in time to take the train to Montrose, reaching there at 12:45 p. m.

STRANGE LOOKING OBJECTS.—We were strange looking objects. Our clothing and shoes were ragged and worn and with a luxuriant growth of beard and a covering of dirt acquired in the last few miles of our trip, we would hardly have been candidates for positions in polite society.

We had been obliged to swim the river, the water of which was as cold as ice, 76 times. The swimming was naturally fraught with great danger, it being necessary for us often to land on sharp points of rock where the water was flowing swiftly. We were bruised from head to foot. Each had lost at least fifteen pounds in the ten days' trip. So ended this portion of the exploration and survey.

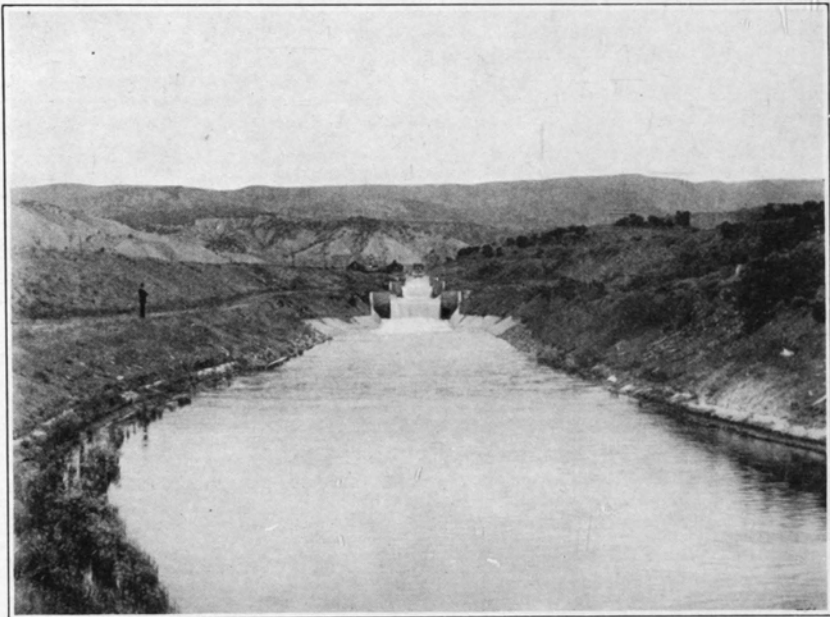
I have sometimes been asked if it paid and if I would undergo the same hardships again. My reply has always been "Yes," if the results to be obtained were so great as those which have followed this survey." When I think of the hardships, of the moments when there seemed to be no light ahead, when it appeared that the present moment was the last, I think, too, of the now prosperous towns in the Uncompahgre Valley, of the many happy homes, the beautiful orchards, the school houses filled with children, and I am content, knowing that out of trial, good cometh.

IN THE LINE OF DUTY.—In justice to Mr. Fellows, it should be said that while the nature of this exploit brought him some undesirable notoriety because of garbled accounts, it was all in the line of professional duty. His record as an engineer does not rest on this particular ten days of strenuous work. Rather is he known for planning and carrying out other tasks important to the progress of Colorado and the West. As already mentioned, he was called on to recommend to the government the reclamation projects which seemed most feasible. Earlier he had carried out the private project of diversion of the Rio Dolores. Other important work assigned him included the mapping of Colorado's forest reserves, segregated under the order of President Roosevelt, and mapping the Mesa Verde National Park, so that the ancient Cliff Dwellings, with their

archæological record of the past, might come under the protection of the government.

DETAILS OF CONSTRUCTION

The Gunnison Tunnel tangent is 30,582.86 feet in length. The upper end is at an elevation of 6,433 feet, approximately 7 feet below low water of the Gunnison River. In cross section the tunnel measures 11x11½ feet and it is 2,157 feet underground at the apex. Construction work was first attempted by the Taylor-Moore Construction Company, who were the lowest bidders. They started work January, 1905, but threw up the contract at the end of May, when construction was continued by the United



South canal just below the west portal of the Gunnison Tunnel, showing drops.

States Reclamation Service. Many difficulties were encountered and there were unforeseen delays, due to the peculiar formation of the mountain range through which the tunnel was being driven. In December, 1906, a seam was tapped carrying warm water surcharged with carbonic acid gas. The discharge was of such violence that workmen were compelled to abandon the heading. The gas drove the blower tenders out of the tunnel. After the heading was regained the heat was so intense and the flow of gas so strong that work became impossible. An inclined shaft had to be

driven into the mountain side and ventilating pipes put in to carry fresh air to the workmen. This caused a delay of six months. The official record of construction in the archives of the United States Reclamation Service at Denver, though replete with engineering detail, also recites the troubles which for a time appeared insurmountable. The following is quoted from this record:

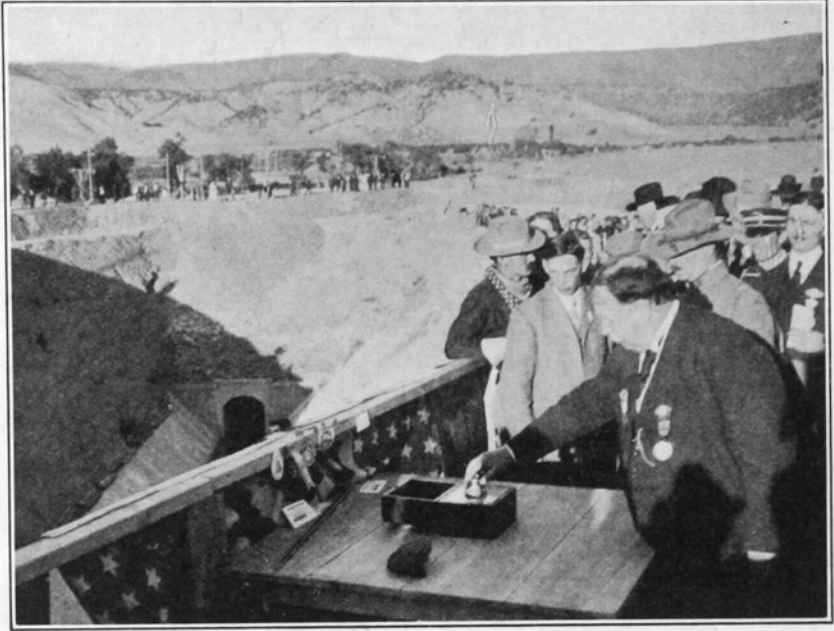
PERILOUS TUNNELING.—“Following completion of this ventilating shaft, the tunnel was driven for two thousand feet through a geological fault which furnished a wierd and unholy assortment of grief. Working in a saturated atmosphere at a temperature above 90 degrees F., the workmen were obliged to exercise the utmost caution to prevent fatalities to themselves. At frequent intervals rushes of water would break from the sides and face, carrying hundreds of yards of sand, which buried tracks, tools and everything else 500 or 600 feet from the breast. * * * A mile from the nearest point of egress, threatened by water and gas, and weakened by the stifling heat, the timid workmen soon deserted.

“After nearly a year of painfully slow and excessively costly work, this ground was passed and the tunnel entered into metamorphic granites which constitute the main body of the mountain.”

Much water was encountered from December, 1906, to March, 1909. A volume collectively amounting to eight cubic feet per second ran through the bore. On July 20, 1908, a cloudburst south of Lujane brought heavy floods and inflicted serious damage at West Portal. At River Portal a town had been built in the canon upon which the sun shone only a short time each day, as it passed above the opening of this great fissure. The town lived only as long as the tunnel was under construction. The total cost of building the tunnel was \$2,905,307. This represents only a portion of the outlay. There must be added the canal and ditch system, which the government acquired by purchase. There were 110 ditches, having an aggregate length of 405 miles, taking water from the Uncompahgre and its tributaries. Of these only 41 were operating under decreed water rights. The first operation of canals by the Reclamation Service was in the summer of 1908, after the transfer to the government of the Montrose and Delta canals. In the fall of 1908 the Loutzenheizer canal was acquired by the government and its operation was begun at the opening of the irrigation season in 1909. The south canal was put into operation in August, 1910, with the opening of the tunnel. The dedicatory exercises were held September 23, 1909, and the guest of honor and principal speaker was the President of the United States, William Howard Taft.

TAFT TOUCHES THE BUTTON.—When President Taft touched a golden plate with a silver bell at 5:18 p. m. September 23, 1909, he closed an

electric circuit that opened the headgate of the Gunnison tunnel and released the flow of water that came through the long bore and ran out upon the thirsty valley of the Uncompahgre. On the platform erected near the tunnel entrance, with the President, sat other men of note, including



President William Howard Taft touching the golden bell which opened the flood through the Gunnison Tunnel, September 23, 1909. (Photo by B. L. Singley. Copyrighted by Keystone View Co., Meadville, Pa.)

Richard A. Ballinger, Secretary of the Interior, Governor John F. Shafroth, State Senator H. T. DeLong, Judge John C. Bell, F. D. Catlin, I. W. McConnell and Mayor J. Q. Allen of Montrose.

Of the long-drawn negotiations between the original owners of the canal systems, the landowners who had insufficient water, and later the Water Users' Association, much might be written, but the delays and difficulties and the obstacles encountered by the farmers in marketing their products, the differences of opinion as to water and construction charges—all these will be forgotten, but the tunnel will remain a monument to the farming people who conceived it and are paying for it and the engineers whose handiwork it is.

JUDGE BELL'S FAITHFUL SERVICE.—Many men had a hand in the great work, and no one served more effectively, constantly and faithfully than the Honorable John C. Bell, who as a member of Congress introduced

the Gunnison tunnel measure, upon which later the Reclamation Act was founded, and who, throughout the years, has exerted a harmonizing influence upon water users and the dispensers of water. A few lines, too, must be devoted to the citizens who were chosen at the water consumers' convention in Olathe, May 5, 1903, as officers of the Uncompahgre Valley Water Users' Association. These men were: John C. Bell, president; James F. Kyle, secretary; A. H. Stockham, treasurer. Executive committee: George S. Conklin, W. O. Stephens, J. M. Halley, Frank Donlavy, D. S. Roatcap, O. M. Kem, F. D. Catlin and L. D. Ross.

The Uncompahgre project was considered to be practically complete in 1925. The total expenditure will be approximately \$6,713,584 when all remaining work is done. The water supply is considered adequate at present, though there is no storage water to fall back on in emergencies. The Board of Survey appointed under Congressional sanction in 1925 to investigate this and other projects made the following statement:

"The irrigation works were constructed for 140,000 acres. Whether the present water supply is sufficient to irrigate this acreage is very doubtful, since the project has no storage water and may find itself short during the season of low flow. * * * The area included in the land classification survey was 103,852 acres. We believe that the present water supply will not cover more than this last area, and may cover less. When the irrigated lands begin to approach this area and water shortage is felt, Gunnison tunnel could be completely lined and Taylor Park reservoir could be constructed and the cost added to the then existing acre charges. However, it is not likely that such development will come for some years."

Dr. B. O. Aylesworth was the Colorado member of this board, which made its report to the Secretary of the Interior.

In 1925 the total acreage farmed under this project was 61,637 acres. Total crop production was valued at \$3,032,395. The principal crops were alfalfa, wheat, potatoes, oats, sugar beets, corn, onions, apples and beans. The average size of farms, based on irrigable acreage, was 43.8 acres. The livestock census showed 5,420 horses, 4,628 dairy cattle, 8,291 beef cattle, 4,656 swine, 28,189 sheep and 61,248 hens and other poultry. The farm population of the project was estimated at 6,092 and the town population, including Montrose, Olathe and Delta, at 7,400—a total of 13,492 people, wholly or partially dependent upon the irrigation of lands within its limits. The assessed valuation of all real and personal property in the project was \$6,094,704 in 1925. This total does not include unpatented homestead lands which are not yet on the assessment rolls.

GRAND VALLEY PROJECT

The area irrigated under the Grand Valley project lies in Mesa County at an elevation of approximately 4,900 feet. The water is secured by diversions of the waters of the Colorado River. The project will cost approximately \$4,500,000 when complete, including the gravity division, which is now 95 per cent complete, and the pumping division, which has not yet been undertaken. The supply of water is considered adequate for the acreage to be irrigated.

Approximately 18,000 acres within the project are now being farmed, and in 1925 the total crop production was valued at \$693,323, the principal crops being alfalfa, sugar beets, beans, tomatoes, potatoes and grains. The livestock census within the project area in 1925 showed 1,139 horses, 1,389 dairy and beef cattle, 586 swine, 6,328 sheep and 15,082 hens and other poultry. There are 260 families living on the project lands, the total population exclusive of towns being 1,075. The average size of farms under the project is 40 acres.

The two projects eventually will bring under irrigation 135,000 acres and will represent a total investment of \$11,000,000. Crops grown on these lands in a three-year period now equal or exceed in value the total investment in irrigation works.

CHAPTER XIV

Practical Application of Research and Experimental Work

Officially there was no State Experiment Station until 1888, but such work was carried on nevertheless by Professor A. E. Blount from 1883 as a part of the development of the college farm. Blount's first report on experimental work is of the crop year of 1883 and states that tests were made with grains, grasses and vegetables, 460 separate plots being cultivated. There were 221 kinds of winter and spring wheat tried, the Russian varieties and Defiance being mentioned among those that excelled in yield.

A quantity of Blount's Hybrid No. 10 wheat was distributed among fifty farmers, all of whom made reports to the college showing high yields, none reporting less than 50 bushels per acre, the maximum being 54 bushels. Tests were begun, also, with potatoes to determine "why potatoes will not produce on the plains of this county." Four kinds of corn were planted.

Thus was the college well prepared by Blount's activities, covering a six-year period, to undertake experimental work in accordance with the federal law.

HATCH ACT PASSED IN '87.—Practically all of the experiment stations connected with the land grant colleges in the United States got their start in the passage of the Hatch Act by Congress in 1887. To support this work each state and territory received an appropriation of \$15,000 a year, to be accepted and used in accordance with certain requirements provided in the act.

The several states and territories rapidly qualified to receive this appropriation. This experimental work for the betterment of agriculture became so much in demand that in 1906 the Adams Act, making an additional annual appropriation of \$15,000 to each state and territory, to be used in strictly technical scientific investigations in the interest of agriculture, was passed by Congress. By this time many of the states were making appropriations in excess of the appropriations provided by Congress, and this condition is generally true today. For example, the Colorado Experiment Station is receiving \$30,000 a year from the federal government and approximately \$100,000 a year from the state treasury for its work.

STATION ORGANIZED IN 1888.—The Colorado Experiment Station was organized in 1888 with the following departments of work: Agriculture, A. E. Blount; horticulture and botany, James Cassidy; chemistry, David O'Brine; meteorology and irrigation engineering, L. G. Carpenter; veterinary, William McEachran. Two sub-stations were established, one at Monte Vista for the San Luis Valley, with H. H. Griffin in charge, and the other at Rocky Ford, for the Arkansas Valley, where Frank Watrous was the first superintendent.

In 1891 the Divide sub-station at Table Rock was organized, with G. F. Breninger in charge, and in 1893 the Rain Belt station at Cheyenne Wells was organized, with J. V. Robertson in charge. This latter station is now known as the Plains sub-station. Its work is reviewed in the chapter on dry-land farming.

Two of these sub-stations, the one at Rocky Ford, in charge of Philo K. Blinn, and the one at Cheyenne Wells, in charge of J. W. Adams, are still operating. Others established in later years at Fort Lewis, Austin and Akron are described on other pages of this volume. The sections of station work active in 1926 and the men in charge are listed as follows:

Agronomy	Alvin Kezer
Animal Investigations.....	George E. Morton
Bacteriology	Walter G. Sackett
Botany	L. W. Durrell
Chemistry	Wm. P. Headden
Entomology	C. P. Gillette
Forestry	B. O. Longyear
Home Economics.....	Marjorie J. Peterson
Horticulture	E. P. Sandsten
Irrigation Investigations.....	R. L. Parshall
Pathology	I. E. Newsom
Rural Economics.....	L. A. Moorhouse
Veterinary	Geo. H. Glover
Civil Engineering.....	E. B. House
Mechanical Engineering.....	LD Crain

FIRST STATE APPROPRIATION.—The first state appropriation especially in the interests of the experiment station was made in 1893, when the General Assembly appropriated \$2,500 to take care of the work at the Cheyenne Wells station. In 1905 the General Assembly made a biennial appropriation of \$14,000 to support the experimental work. After that date these appropriations increased rather rapidly in amount until 1915, when the station received a mill levy. This was increased in 1917 and again in 1921, which furnishes approximately \$100,000 a year.

The number of projects being carried at the present time is 158 and the number of sections engaging in the work is fifteen. Eighteen employees are giving full time and forty-five part time to the experiment station work. The number of bulletins published up to the present time is 311, with 38

annual reports and 62 press bulletins, all of which have been distributed free to those desiring them.

THE PURNELL ACT.—The passage by Congress of what is known as the Purnell Act, on February 24, 1925, materially strengthened research



Irrigating test plots in the early years on the State Experiment Station farm.

along certain lines which, theretofore, had not been given adequate attention. The Colorado State Experiment Station, along with other states, immediately took advantage of the new opportunity for scientific service to the agricultural industry. Three fields were selected for work with the funds made available under the enactment, namely, agricultural economics, home economics and rural sociology, these lines being relatively new and but little developed through research.

The first funds became available in Colorado July 1, 1925, the sum being \$20,000 to cover the work of 1925-6. For the period beginning July 1, 1926, this was increased to \$30,000. The projects undertaken include Arkansas Valley niter control, co-operatively by the Agronomy and Bacteriology sections.

Physiology of seeds is being taken up by the Botany section.

The Economics section has the following projects under way: Farm organization and cost of production survey in typical peach-growing dis-

tracts; detailed farm accounting and farm organization research on 26 irrigated farms in the Greeley area; costs and methods in producing cattle and sheep in Colorado; the social status of Spanish people in Colorado; taxation problems in agriculture.

The Home Economics section has the project of the baking of flour mixtures in high altitudes, and the Pathology section has contagious abortion; agglutination tests. The foregoing explains the work made possible by passage of the Purnell Act.

The directors who have been in charge of the station activities from its organization until the present are as follows: C. L. Ingersoll, 1888-1891; Walter J. Quick, 1891-1893; Alston Ellis, 1894-1899; L. G. Carpenter, 1899-1910; Charles A. Lory, Acting June, July, 1910; C. P. Gillette, July, 1910, to date. LD Crain has been vice-director since 1918.

THE WORK OF DR. HEADDEN

In no field has the Colorado station aroused more comment than in chemistry. There was fundamental work to do in that division, and the station was fortunate in finding for that work, almost in the beginning, a man of scientific mind and training, who tackled the problems, especially those affecting the chemistry of soils, without a thought of anything but arriving at the truth. While the present volume is an historical record and not a scientific work, the historian is justified in giving emphasis to the activities of Dr. William Parker Headden, chief chemist of the Colorado State Experiment Station, because of the far-reaching influence of the work done by him in the past thirty-three years and which, fortunately, is still under way as this is written.

Dr. Headden has not only shown a tremendous capacity for painstaking research, but he has been a prolific writer, and most of his results have been reduced to manuscript as rapidly as achieved. In reviewing his work, done over such a long period of years and upon problems of a highly technical character, the layman is at a disadvantage in his interpretation of results, though, from the lay reader's standpoint, it may be better so. The historian cannot go beyond a brief and non-technical review, with the suggestion that the student interested in technical detail may turn to the bulletins of Dr. Headden, which are available in agricultural libraries.*

THE NITER PROBLEM.—Perhaps the most important of all soil problems upon which the science of chemistry has been asked to throw light is

*In the General Index to Colorado Experiment Station Publications (Feb. 1921), will be found a list of thirty-eight bulletins written by Dr. Headden, and fifteen have appeared since this publication was issued. This represents only such part of the literature on Agricultural Chemistry of which he is the author as appeared under the authority of the Colorado Experiment Station.

that of excessive nitrates. Serious loss to certain branches of the agricultural industry in several localities made this an acute problem. What was the cause of the trouble? As an answer to that question came Bulletin 155 by Dr. Headden, which attracted world-wide scientific interest. This bulletin is entitled "The Fixation of Nitrogen in Some Colorado Soils." It was published in February, 1910. The discoveries therein recorded mark a decided step in advance in coping with soil troubles of the arid west of this continent and other world regions where similar climatic and geologic conditions prevail.

The question raised in the scientific world was whether the formation of nitrates in Chili and Peru may have been due to the micro-organisms which are responsible for the excessive nitrification of some Colorado soils. Whatever the answer as to other regions, in Colorado the conclusions of Dr. Headden along this line have been accepted and acted upon in devising



How experimental grains are protected in harvesting on the State Experiment Station farm.

remedial measures. A remarkable fact is that while one region of the world pays highly for Chilean nitrate to supply a soil deficiency, other regions, under another type of soil and climate, suffer loss because of excessive amounts of the same chemical substance.

In the investigations leading up to the conclusions expressed in Bulletin 155, Dr. Headden explained that the designation of the niter condition as "black alkali" was erroneous. Black or brown spots in the soil gave rise to this error, these spots being due to the presence of sodic carbonate. Sodic carbonate occurs in only a few sections of Colorado in quantities injurious to vegetation. The source of this chemical is weathering of rocks and even soil particles. There is no direct relation between the niter condition and the formation of carbonates in semi-arid countries.

THE TROUBLE IS INTENSIFIED.—A puzzling circumstance in relation to the niter problem was the fact that, as agricultural practice advanced toward perfection, the mysterious trouble increased. Yields ran down in spite of the best methods of culture, so the story went, and Dr. Headden's investigations disclosed that the decreased yields were intensified by cultural practices. These effects were felt on sugar beets and melons, particularly in a portion of the Arkansas Valley. Thin brown lines at the outer edge of irrigation furrows, thought to be due to heavy manuring, were found by Dr. Headden to be symptoms of niter trouble.

"My attention was directed to a melon patch last season, 1909, which was sick; this is the term used. There was no rust, no insects, nothing visible to indicate disease. The melon plants were, however, puny and unthrifty. The soil was in fine condition and had been cultivated for several years and fertilized."*

That was the condition as it appeared. Another case was that of a young orchard of twenty acres. The trees died along a certain strip of this orchard. The surface of the ground was brown where these trees died and no other vegetation lived there. There was no sign to indicate unproductiveness. To all appearances the land was desirable. But there were the dead trees. The cause was excessive nitrates.

DEAD SPOTS IN ALFALFA.—Then there was the even more remarkable instance of an alfalfa field near an irrigation ditch. Dead spots occurred in the alfalfa. It looked like a plain case of seepage. The ditch was there on higher ground than the alfalfa. A sample of that soil contained nitric acid corresponding to over 27 per cent of sodic nitrate. Calculated on the basis of four inches of soil depth, it meant there would be 20,290 pounds ($10\frac{1}{4}$ tons) on each acre. Examples were multiplied, tests continued, and finally not only was the trouble traced to excessive nitrates, but it was established that micro-organisms—the azotobacter—caused this excess. The azotobacter's activity as a nitrogen fixer was not unknown, but that bacterial action could and did produce nitrates in such excessive quantities as to render soil unfit for crops was a discovery. At that point the chemist turned to the bacteriologist for aid, the bacteriological investigations on the problem being made by Dr. Walter G. Sackett.

Bulletin 155 was, in a sense, a report of the diagnosis of the niter problem. Later came Bulletin 183, published in May, 1912, rounding out the investigations into the niter problem. The title of this is: "Deterioration in the Quality of Sugar Beets Due to Nitrates Formed in the Soil." This is a volume of 180 pages, which, as a scientific document, takes its place along with the writings of noted European chemists who have contributed

*Bulletin 155, "The Fixation of Nitrogen in Some Colorado Soils."

to our technical knowledge of the sugar beet. One of the questions to be answered was: "What are the effects of nitrates upon the composition of the sugar beet?" Neither in this country nor in Europe had this question been satisfactorily answered. The conclusion recorded in Bulletin 183 is, "that the increased production of nitric nitrogen in our irrigated soils, over large sections, is the chief cause for deterioration of our beets."

Again the cause was discovered, and now other sections of the station and independent investigators are at work on the remedy.

ARSENICAL POISONING.—Another line of chemical research in which the Colorado Experiment Station established basic facts in relation to problems of the soil is covered in Bulletins 131 and 157 by Dr. Headden, the titles being identical, namely, "Arsenical Poisoning of Fruit Trees." These bulletins were published in 1908 and 1910, as a result of years of patient scientific effort. On this subject Dr. Headden set the pace, no such study having been given the world up to that time. To avoid injustice to any individual orchard owner, Dr. Headden refrained from mentioning names or exact localities. The problem is not local in character, but like the niter problem is met frequently in arid or semi-arid countries. It is true that climatic and soil conditions that seem particularly favorable to the production of fruits of the finest quality and flavor also are most susceptible to troubles of this sort.

In the case of arsenical poisoning of trees, the first threat was that these discoveries by Dr. Headden would hinder the fight made on the codling moth with arsenical sprays. Trees died, as it were, from overdoses of arsenic, from two possible sources—the soil and the spray material. However, the tests indicated that judicious spraying was not harmful to the tree nor to the fruit that it bore. Dr. Headden's work shows that the wood of fruit trees contains arsenic, that it is in the leaves and in the fruit, and that it is taken up by the tree from the soil. A quotation from Bulletin 157 states the condition concisely:

Corrosive arsenical poisoning attacks the tree at the crown, below the surface of the soil and usually involves the large roots also. The attack is from the outside and causes the disintegration of the bark, the cambium is not destroyed until the corrosion has perforated the bark which is not loosened. Pear and apple trees are affected; the pear tree is, at least, as susceptible to the action of the arsenic as the apple tree. Very many, if not the greater part of our soils, contain arsenic. This is true of our virgin soils as well as of our cultivated soils.

NO DANGER IN EATING FRUIT.—Naturally the question was whether this meant danger to those eating the fruit of trees grown in arsenical soils. On this point the evidence was reassuring, Dr. Headden going about it in practical fashion. Again we quote from Bulletin 157:

It is true that the presence of arsenic in apples from California, Michigan, New York, Pennsylvania, Ohio, Illinois and Colorado show that fruit grown on sprayed trees

contains arsenic and, further, that this is a general fact, but there is no reason at all for alarm, for either the health or life of persons eating such pears or apples. Two of my assistants and I have tried it, one of us eating nearly eight pounds of apples by weight in 12 hours. The apples from Illinois, Ohio and New York were just as rich in arsenic as those from California or Colorado. I repeat that so far as the public is concerned there is no reason at all for the least concern.

In this, as in the niter investigations, Dr. Headden sought the truth regardless of its effect on the agricultural industry, on the very good theory that it would be senseless to close our eyes to adverse facts, and that there is positively no hope for devising a remedy for soil or other troubles without first knowing definitely the cause.

It is not strange that a man of science who thus approaches a problem, apparently without regard to commercial effect of the result of his discoveries, is sometimes criticised unjustly. However, Dr. Headden has had the satisfaction of living to see his course justified in every line of research in which he has been engaged. Sometimes his disclosures have meant loss, but only in the sense that the decline of an industry or a crop in certain areas was realized earlier than if science had not aided in discovering causes. And then, to offset the first disappointment, the remedy has usually been found and applied, though sometimes coming from other branches than chemistry.

BLACK ALKALI PROBLEM.—In the early '90s a considerable section of the San Luis Valley, in the northern portion of Alamosa and southeastern portion of Saguache Counties, was remarkably successful in wheat production, in spite of its altitude of 7,500 feet. This section is adjacent to the towns of Mosca, Hooper and Moffat. Mills and elevators were established and wheat growing flourished where now much of the land has gone back to chico and greasewood. The area involved comprises over 400,000 acres. The condition has usually been ascribed to seepage. Sub-irrigation was practiced and this raised the water plane to within twenty-two to twelve inches of the surface. By capillarity and evaporation the "black alkali" was brought to the surface. Normally the water level was at thirty-six to thirty-seven inches below the surface, the valley being an immense artesian basin. Sub-irrigation raised the water to within a foot or a foot and a half of the surface, and it was this practice of "subbing" that did the damage. The ground water, according to Dr. Headden's tests, carries 260 parts of "black alkali" to the million parts of water. As sub-irrigation continued year after year to bring up the sodic carbonate, the land finally became so rich with it that the ordinary crops would no longer grow. Having determined what caused the trouble, Dr. Headden also suggested the remedy. This has not been applied for reasons which will be explained. Drainage has been resorted to with negative results.

CONDITIONS VERY BAD.—“The conditions are very bad,” says Dr. Headden in Bulletin 231. “There is no hope of removing, in any way, the great reserve supply of sodic carbonate as indicated by the richness of the artesian waters in this ‘black alkali.’ This section of the valley is full of this water, and the deeper we go the richer is the water in ‘black alkali.’ The more of this water we bring to the surface, or allow to leak into the upper strata out of uncased wells, the worse we are off. No man can tell how long it has taken to bring about these conditions, but they have already existed from the very early history of the valley, and, so far as we are concerned, they are as permanent as the mountains inclosing the valley. The water has probably never run out of this section of the valley, and the deep artesian water never will, if we measure time in terms of human lives.”

Dr. Headden says the remedy is gypsum (sulfate of lime), which will convert this “black alkali” into “white alkali,” which is practically harmless. The question raised in Bulletin 231, “Black Alkali in the San Luis Valley,” is how can the gypsum be obtained? Dr. Headden admits that there are great difficulties, as no gypsum occurs in the valley, and it would have to be brought in over the mountains at what now appears to be a prohibitive cost.

Theoretically the remedy is effective, but when applied under the peculiar conditions of soil and water met in the San Luis Valley the results were not satisfactory to Dr. Headden. While the effects of sodic carbonate can be neutralized, the substance is present in such quantities, and it is brought to the surface by water so persistently, that it looks like a hopeless task to combat it. The problem is dormant at present, the land idle, save for some grazing use and a nibbling around the edges with alfalfa, sweet clover and barnyard manure. That a way will be found to bring the area back into tith and productivity, through some branch of agricultural science, is the confident expectation of those familiar with the problem. It is that spirit which permeates the work of agricultural research in the West and which has already done so much for agriculture, though often in a way unrecognized by the general public.

For many years Dr. Headden has had an able associate in research work in the person of Earl Douglass, and lately also there have been three assistants, namely, J. W. Tobiska and C. E. Vail at Fort Collins, and Justus C. Ward at the Rocky Ford station.

BACTERIOLOGICAL SECTION

The work of Dr. Walter G. Sackett, bacteriologist of the State Experiment Station, has been of great scientific import as well as practically

valuable to the agricultural industry. Dr. Sackett came to the station as a result of Dr. Headden's findings in the niter problem, already mentioned. His work in Colorado on this problem is to be found in a series of five bulletins that deal with the unusual fertility of western alkali soils. This work points out the cause of the high nitrate content of these soils, which has become so excessive in some instances as to be injurious to agriculture. Field practices have been developed for utilizing these nitrates, whereby the farmers of the state are saved thousands of dollars annually in avoiding the purchase of commercial nitrate of soda.

Dr. Sackett is the author of five chapters on bacterial diseases of plants in Marshall's "Microbiology," a textbook on general bacteriology.

The alfalfa stem blight is generally known in this country as Sackett's Disease, because of Dr. Sackett's discovery of the relation of spring frosts to its occurrence. Up to the time of that discovery practically the entire first cutting of alfalfa was lost where the disease was severe. As a result of his studies, resistant varieties have been found and proper field practices inaugurated whereby the normal tonnage of hay can be obtained in spite of the disease.

Next in importance are his contributions to the bacteriology of alkali soils, set forth in the following:

- Bacteriological Studies of the Fixation of Nitrogen in Certain Colorado Soils. Bul. 179, Colo. Exp. Station.
- The Ammonifying Efficiency of Certain Colorado Soils. Bul. 184, Colo. Exp. Station.
- The Nitrifying Efficiency of Certain Colorado Soils. Bul. 193, Colo. Exp. Station.
- Some Soil Changes Produced by Soil Micro-organisms. Bul. 196, Colo. Exp. Station.
- The Occurrence of *Clostridium Botulinum* in Colorado Soils. (In preparation.)

Other contributions by Dr. Sackett to knowledge of the bacterial diseases of plants which are important are the following, including results of research in Colorado as well as in North Carolina and Michigan, where he served on the experiment station staffs:

- The Granville Tobacco Wilt. Bul. 188, North Carolina Exp. Sta. Stevens and Sackett.
- Bacterial Diseases of Plants Prevalent in Michigan. Bul., Michigan Exp. Station.
- Bacterial Diseases of Plants Prevalent in Colorado. Bul. 138, Colo. Exp. Station.
- A Stem Blight of Alfalfa. Bul. 158 and 159, Colo. Exp. Station.
- A Bacterial Disease of Field and Garden Peas. Bul. 218, Colo. Exp. Station.
- Diseases of Beans. Bul. 234, Colo. Exp. Station.
- A Bacterial Disease of the Wrang Cherry. Bul. in Preparation.
- A Bacterial Root Rot of Alfalfa. Science, Vol. LXII, No. 1595, 1925.

The bacteriological section does much service work in its laboratory for the people of Colorado in the protection of the food and drinking water.

RESEARCH IN AGRONOMY

The Department of Agronomy was officially organized June 1, 1909. Prior to 1909 work in crops, plant breeding and soils had been a part of the work of the department of agriculture of the Colorado Agricultural College and Experiment Station. Crop experimental work started officially as soon as the experiment station was established in 1888. In fact, much had already been done on the college farm before the station was established.

The first crop experiments were reported by A. E. Blount in Bulletin No. 2 in 1887. These were with grains, grasses and vegetables. Blount* was a prodigious worker. He produced many new grains, but only one of these persisted in Colorado agriculture for any length of time. That was Defiance spring wheat. Defiance became the leading spring wheat of the irrigated regions. It held that place for many years. In fact, it was not displaced until about 1917 and 1918. In this connection it is interesting to note that many of Blount's wheats were successful in other states. Some of them are still being grown in New Mexico. Some of the best wheats of Australia were developed from crosses made with a few of Blount's wheats.

In 1888, the year of the establishment of the experiment station, James Cassidy and David O'Brine published Bulletin No. 7 on potatoes and sugar beets. Thus the experiment station early began to get and publish information on the handling of these two crops, which are now among our leading wealth producers.

In the period from 1888 to 1904 investigations were carried on with alfalfa, sugar beets, Colorado grasses, dry-land agriculture, pasture grasses and leguminous crops and wheat raising. James Cassidy and David O'Brine were in charge of the work from 1888 to 1890. Walter J. Quick was in charge of investigations from 1891-1892. In 1892-1893 Frank L. Watrous and David O'Brine published bulletins on sugar beets and potato growing. In 1893 O'Brine concluded his connection with the experiment station and published a progress report on his work with larkspur and loco.

W. W. Cooke carried on experiments from 1893 to 1895 and published bulletins in conjunction with Frank L. Watrous. Cooke retained his connection with the experiment station to 1900. During this period he published bulletins on sugar beets and other farm crops, especially corn and potatoes.

*Blount was a graduate of Dartmouth College, 1859; was president of the Female College of Cleveland, Tennessee, for nine years; afterwards professor and superintendent of the Agricultural Experiment Station of Knoxville, Tennessee, where much work was done in the improvement of small grains.

J. E. Payne joined the staff in 1900 and worked from 1900 until 1910, with a short break when he was employed by the U. S. Department of Agriculture in 1907.

H. H. Griffin, now agriculturist for the Great Western Sugar Company in the Fort Collins district, was with the experiment station staff in 1900 and 1901, leaving in 1902. F. L. Watrous left the staff the latter part of 1900. His last publication was one on bromus inermis, Bulletin No. 61, which was under the joint authorship of Watrous, Griffin and Payne and which was published in 1900.

Griffin published Bulletin 62 in 1901 on cantaloupes; Bulletin 68 on pasture grasses, leguminous crops and cantaloupe blight in 1902. His last publication was on the tomato industry of the Arkansas Valley in 1903.

Payne did most of his work on the dry lands of Colorado eastern plains, where he made studies of wheat growing, alfalfa growing, soil tillage, crop adaptations.

COLORADO 37 OATS.—From the period 1903 to 1908 the crop experimental work was in the hands of W. H. Olin, A. E. Danielson and Fritz Knorr. During this period Colorado No. 37 oats, still the highest yielding



Colorado No. 37 oats on State Experiment Station, Fort Collins.

oat in Colorado, was selected from plants found in the San Luis Valley. The present Colorado 37 oat has been re-selected and regenerated by the present department of agronomy. The original selections, however, were made by Danielson, Olin and Knorr. This one selection has added immense wealth to the state, because it was the best yielding oat for our irrigated regions.

On June 1, 1909, the department of agriculture was reorganized, and from it there were established the departments of Animal Husbandry, Agronomy and Farm Mechanics. The Department of Farm Mechanics was in existence only one year. With the resignation of H. M. Bainer, its first head, in 1910, the farm mechanics work was transferred to the agronomy department, where it has remained up to the present. The Department of Agronomy started its work under the headship of Alvin Kezer, who was brought from the University of Nebraska.

In 1909 and 1910 there were published in this department informational circulars on growing sugar beets and broom corn. A press bulletin (No. 49) was put out in 1909 on treatment of grain to prevent smut. In 1913 Bulletin 190, "Variation Studies in Brome Grass," appeared. This work showed the possibilities of improving this very important pasture crop.

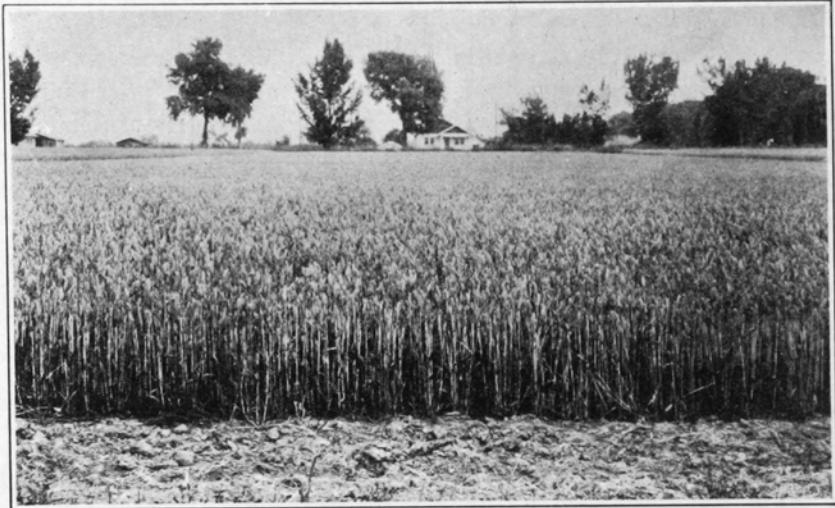
Bulletin 203, "Farm Costs on the Colorado Agricultural Farm," appeared in 1914. In 1915 Bulletin 209, "Irrigated Agriculture in the San Luis Valley" was a co-operative piece of work on irrigation which appeared under the authorship of V. M. Cone and Alvin Kezer. The same year Bulletin 214, "Forage Crops for the Colorado Plains," was published. This bulletin had a marked influence in the forage crop practices of the plains, because it made available experimental work and experiences not previously usable by dry land farmers.

In 1917 beans were becoming an important crop and received recognition in Bulletin No. 226, which discussed the growing of beans and their diseases. The bulletin was under the joint authorship of Alvin Kezer and Walter G. Sackett. In the same year Bulletin 227, "Dry Farming in Colorado," was published.

In 1918 the bean bulletin was revised and new material added. The same year there appeared Bulletin 249, entitled "Mendelian Inheritance in Wheat and Barley Crosses," by Alvin Kezer and Breeze Boyack. This bulletin was a very important contribution to plant breeding information.

Almost as soon as the Department of Agronomy was organized in 1909 it commenced a study of Colorado crops and their improvement. Colorado was a new state, and due to the mountains, climatic and soil conditions were highly variable. Accordingly settlers were clamoring for information on what crops to grow and how to grow them. The first work of the Department was, therefore, an effort to supply information on crop growing and to get crops adapted to the various regions. Plant breeding was early started to improve existing types of crops, in order to make them better adapted to some of these varied conditions.

COLSESS BARLEY.—From crosses made in 1911 between a beardless barley, Success and the then highest yielding bearded barley, Coast, there resulted many progenies, one of which was selected as having superior qualities. This barley was named Colsess. It is a beardless, high yielding, stiff-strawed barley. It has the advantage of no beards and still produces a high yield. This barley is adapted for growing in mountain agriculture



Colsess barley on Experiment Station farm, Fort Collins

where a barley is needed, which can be used for grain, hay and pasture, and pea and grain mixtures for forage. The production of Colsess has met these needs.

IRRIGATION STUDIES.—The Department early recognized that many regions were insufficiently supplied with irrigation water. Accordingly research was started to discover the most critical period in the growth of crops for irrigation water. This investigation was begun in 1916. In 1920 the manner of conducting the work was changed. The project is not yet completed, but it has already shown that if the wheat crop has water enough to keep the plants growing, that one irrigation given at heading time, or any period close to heading time, will produce as much grain as three or four irrigations applied indiscriminately through the growth of the crop.

Going along with this investigation has been a study of the residual effects of irrigation. That is, a study has been made of what happens to the crop which follows, where different irrigation practices have been

conducted. It is surprising what striking changes take place in the soil from irrigations at different times. Early irrigations, if the climate is dry afterwards, mean rather low yields on crops grown on the same land the next year. Late irrigations, however, have a very beneficial effect upon crops grown the following year.

ROTATION CONTROLS NITRATES.—Dr. Headden's work showed that many Colorado soils produced too much nitrate for the well-being of many crops. Nitrate is a good plant food material, but when present in excess produces harmful effects on the crop. In 1921 the Agronomy Department, co-operating with the Bacteriological Section of the Experiment Station, started comprehensive studies in the Arkansas Valley to see if excessive nitrate production could be put under control. These studies are not yet completed, but it has already been shown that a rotation of crops is necessary to control nitrate production. It has been shown that the production of nitrates is high where crops are inter-tilled during the growing season and relatively low on the crops which are not inter-tilled, such as clover, alfalfa, small grains and pasture crops. It is, therefore, apparent that a part of the system of control of excess production consists in a rotation in which tilled crops are suitably interspersed with untilled crops.

Colorado has much mountainous territory at altitudes which are higher than those commonly devoted to crop production. The Agronomy Department early realized the agricultural importance of these regions and commenced studies of high altitude crops. Since 1911 these studies have been largely concentrated at the Fort Lewis farm near Durango. A great deal of information has been gathered, much of which is now about ready for publication.

The staff, under direction of Professor Kezer, on agronomy research includes D. W. Robertson, associate agronomist; G. W. Deming and F. B. Smith, assistants at Fort Collins; P. K. Blinn, superintendent, Rocky Ford farm, and J. C. Ward, chemist, Rocky Ford; Dwight Koonce, assistant agronomist in high altitude work at Fort Lewis.

ARKANSAS VALLEY EXPERIMENT STATION

The Arkansas Valley Experiment Station farm was established at Rocky Ford, in 1888. Since 1895 the station has been in charge of Philo K. Blinn. It was started at about the time that the large irrigation canals were being constructed in the valley, and the agricultural development had just begun in real earnest.

The first experimental work was largely confined to the testing out of different varieties of grain, forage crops, fruits and vegetables to deter-

mine the crops best suited to the valley empire that was then being opened up for settlement.

Some of the early experiments had a deeper significance than mere variety testing. For ten years before a sugar factory was built at Rocky Ford, the station was investigating the possibility of the beet sugar industry. The sugar tests and purity of the beets were so phenomenally high that they were almost beyond belief, yet they were authentic, and were the stimulus for the development of the sugar industry of today.

Extensive experiments were also conducted in the interest of potato growing during those early years, until it was pretty well determined that potatoes were not a very dependable crop in the valley. This was a negative result, yet no less valuable for the farmer who was willing to accept the conclusion, namely, that some seasons fine potatoes could be produced, yet as a commercial crop they were not to be depended on.

CLOVER SEED TESTS.—Another interesting bit of experiment was a test of three acres of red clover, sown in 1895. The following season one crop was harvested for seed and yielded twenty-four bushels of clean seed from the three acres. The seed only brought six cents per pound. Even alfalfa seed of the choicest grade sold at the same price. Apparently the clover seed experiment was forgotten until about twenty-five years later, when the farmers in the vicinity of Rocky Ford turned their attention to red clover seed production, which now frequently will yield twelve to fifteen bushels per acre, and will usually bring twelve to fifteen dollars per bushel.

Henderson's bush lima beans and the Giant Gibraltar onions were successfully demonstrated on the experiment station farm in 1895. But only in very recent years have these crops become important in the valley, though they are almost surely destined to increase in importance.

About ten or twelve years after the sub-stations were established, the federal authorities at Washington ruled that funds appropriated for the Agricultural College Experiment Station should not be used for maintaining sub-stations. So, in the absence of adequate state funds at the time, several of the sub-stations were suspended or ultimately abandoned.

The sub-station at Rocky Ford underwent some radical changes. The size of the farm was reduced from two hundred acres to forty acres; the types of experiments previously carried on were greatly modified; the experimental orchard was grubbed out, the office of superintendent was changed to that of field agent for the Arkansas Valley. The forty-acre tract on which the buildings were situated was retained as headquarters for the field agent, and for use of those experiments where full control of all cultural operations was desirable as funds could be made available.

With the demonstrational type of experiments discontinued and a general lack of funds for constructive improvements, the station farm lost much of its former attractiveness for visitors. Yet with all the radical changes required, the station has been able to carry on many valuable investigations in the interest of better agriculture in the valley, through the services of its field agent, and by many other special lines of work through the efforts of the different departments of the Experiment Station, such as the control of insect pests, plant diseases, the measurement of water and the solution of various acute problems that have arisen from time to time.

The activities of the field agent have consisted largely of investigations carried on in co-operation with farmers in the valley, together with such experiments on the station farm as funds might permit. The results of these experiments and investigations with definite recommendations have been published in bulletins from time to time.

The tomato industry of the Arkansas Valley was studied and definite recommendations to improve the production of the crop were made and published in Colorado Experiment Station Bulletin No. 78, in 1903.

ADING THE CANTALOUPE INDUSTRY.—“Cantaloupe Seed Selection” was the subject of Bulletin No. 85, in 1904. This was the first public protest against saving cantaloupe seed from “cull melons.” Attention was directed to the importance of developing uniformity, and better market quality as a safeguard for the future development of the industry in the valley, and as a result greater attention was paid to seed selection, until Rocky Ford has become the center of a great cantaloupe seed production business, supplying a major portion of the seed for most all the large growing sections of the United States.

Perhaps the most important cantaloupe experiment with the most far-reaching influence for the state and valley, was the discovery of a disease-resisting cantaloupe, which was reported in Colorado Bulletin No. 104, 1905.

This bulletin had a salutary effect on the ideals of seed selection of every cantaloupe seed grower, although at first, the facts published were doubted and ridiculed and even scoffed at by some. But ultimately, the Rust-Resistant Pollock strain of cantaloupe became the foundation stock of all the present-day standard varieties of Rocky Ford cantaloupes.

Bulletin No. 126, 1908, on Cantaloupe Breeding, directed attention of some of the cucumber pickle companies to the possible development of similar work being carried on for the improvement of cucumber seed. And as a result, a large cucumber and cantaloupe seed growing industry has developed in the Arkansas Valley.

Another noteworthy project of the Experiment Station has been the alfalfa investigations that have been carried on for nearly twenty years.

BLINN'S ALFALFA DISCOVERY.—The first work published was "The Relation of Type to Hardiness" in alfalfa. This was the outcome of a very extensive comparative test of varieties of alfalfa from almost every country in the world. This investigation resulted in an important discovery; namely, that there are two large groups or types of alfalfa; within each group there are some variations. These two groups or types of alfalfa are the northern or hardy type and the southern or non-hardy type. The varieties in the northern type have a different root system. The crown grows under the ground and is thus protected by a layer of earth. This hardy or northern type not only grows underground, but produces a branching root system in addition to a tap root system. The southern type, which is non-hardy, has a crown at the surface of the ground or slightly above the ground, and develops a typical tap root system.

This discovery was made by Prof. Philo K. Blinn. It probably had a greater immediate effect on alfalfa growing than any discovery made on



Blount's Defiance wheat, State Experiment Station.

alfalfa in recent years. It had much to do with the exploitation of Grimm alfalfa throughout the country and it has been of great value in spreading the use of alfalfa in various states and sections where the non-hardy strains had been failures. Bulletin 181, 1911, gives details on this work.

Alfalfa is basic as a soil builder in crop rotations, and for feeding livestock. Feeding in turn enriches the soil of every farm where the livestock is kept, hence the investigations of alfalfa that have been carried on are of basic value to the agriculture of the state. The concluding report of the work on alfalfa was published in Bulletin No. 257, 1920, on the subject of the "Factors that Affect Alfalfa Seed Yields." This bulletin has valuable information for anyone interested in alfalfa seed production. The work on alfalfa was discontinued on account of the development of adverse soil conditions on the Experiment Farm, which was not well adapted to alfalfa seed development work.

SOLVING SOIL PROBLEMS.—The establishment of the beet sugar industry and the development of the vine crop industry, resulted in large acreages of these crops being grown in the Arkansas Valley, without the proper consideration of crop rotation and other methods of preserving soil fertility. The result was that, after about twenty years, serious soil problems began to appear, and the Experiment Station was called in to help solve the difficulty.

In the spring of 1922, the station farm was laid out in a series of crop plats, in order to carry on an investigation of crop effects on soil fertility for certain standard crops, the results to be measured by soil analyses of samples which were to be taken at frequent intervals throughout the year, from each plat with different crops growing. A chemical laboratory was equipped at Rocky Ford to carry on the soil tests, and for the past five years this soil investigation has been the major line of experimental work. The work has not been completed for final publication, yet the general indications are that there are certain crop effects which will need to be considered in planning the proper sequence of crops for basic rotation, which will ultimately correct the unbalanced soil condition when the facts are fully known.

Basic types of crop rotation for different soils are being worked out and the questions of commercial fertilizers also are being tested.

Bindweed eradication and the development of a high grain-yielding variety of corn, are minor problems that are being worked out for the farmers in the valley.

THE AKRON FIELD STATION

The Akron Field Station, one of 24 operated by the United States Department of Agriculture in the Great Plains area of the West, was established in 1907, as a result of a determination on the part of government agriculturists to locate these stations where they would serve best in the development of scientific data for guidance of dry land farmers, and a

desire on the part of progressive citizens of Washington County to show the world that profitable farming was possible in that region without irrigation. From the department side the man who was responsible for selecting the Akron location was E. C. Chilcott, agriculturist-in-charge of dry land agriculture, while from the farmer side James Brunker seems to have been the chief proponent of Washington County's claims as the right spot for the station. Mr. Brunker now lives at Hillrose; during the period when the location was in question his home was at Brunker, about ten miles southwest of Akron.

While the Akron field station now serves both as a federal and a state experimental farm, its original character and identity as one of the federal dry land stations is still maintained. It is a unit in the chain of stations stretching from northwest Texas to the Dakotas, on which practically every problem relating to the soils and cropping system of the Plains region has been tested.

CITIZENS PETITION CONGRESS.—In February, 1907, there was turned over to Mr. Chilcott at Washington a letter from Congressman Robert Bonyngé of Colorado, urging establishment of one of the field stations at Akron. Accompanying the congressman's letter was a letter from James Brunker, farmer, and a petition bearing signatures of 67 residents of Washington County, urging the Akron location.

Government funds were limited and no money could be used for the purchase of land. A proposition was made, therefore, to the citizens of Washington County, that if they would deed to the government a suitable tract of land, selected by Mr. Chilcott, and would furnish \$3,000 in cash for buildings and other equipment, the department would establish and operate a field station near Akron. James Brunker and August Muntzing were the two citizens of the county with whom Mr. Chilcott mainly conducted the negotiations. The outcome of these negotiations was a donation by Washington County of a 66-acre tract of land which was deeded to the United States of America, May 3, 1908. To this was added a quarter section of government land withdrawn from entry and assigned to the Agricultural College for forestry experimental purposes. It was incorporated in the Akron field station and has been thus operated since under a co-operative agreement between the state and federal government.

While the land donation on the part of the county was easily arranged, to raise \$3,000 in cash by popular subscription in Washington County in 1907 looked almost hopeless. It was then that Brunker and Muntzing had to do some scheming. They decided to appeal to the railroad company and to the Empire Ranch and Cattle Company for help, with the result that General Manager Holdredge of the B. & M. made an outright donation

on behalf of the railroad company of \$1,000, while the land company gave \$500. That provided for one-half of the cash. It was put up to the business men of Akron at a mass meeting to raise the balance, which they did, willingly.

PAYNE FIRST SUPERINTENDENT.—After the details of the purchase had been completed and the land formally conveyed to the government, J. E. Payne, who had been employed by the state as an investigator in dry land agriculture, was appointed superintendent of the Akron station, taking charge July 1, 1907. He remained in that position until April 1, 1910, when he resigned, Oliver J. Grace being named to succeed him. Grace served ten years, until June, 1920, when the present superintendent, Joseph F. Brandon, took charge. The list which follows shows names of the scientific workers who have conducted investigations in their several lines at Akron, and the years during which they were stationed there:

WATER REQUIREMENT INVESTIGATIONS

Dr. L. J. Briggs, 1910-1916	N. Peter, 1913-1916
Dr. H. L. Shantz, 1910-1916	H. W. Marquard, 1914
A. F. Kidder, 1910	J. D. Hird, 1914-1915
Homer Martin, 1910-1912	R. L. Piemeisel, 1914-1916
Auguste Bonquet, 1911	H. Shattyn, 1915, 1916
A. McG. Peter, 1911, 1912, 1913, 1915	T. R. Renault, 1915, 1916
R. D. Rands, 1912-1914	F. M. Eaton, 1916
G. Crawford, 1912-1916	Clyde Griswold, 1916, 1917
A. F. Cajori, 1913-1916	

OFFICE OF FORAGE CROPS

G. E. Thompson, 1910-1911	George W. Morgan, 1912
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DROUGHT AND ALKALI RESISTANT PLANT BREEDING

A. C. Dillman, 1910-1917

ASSISTANT IN DRY LAND AGRICULTURE

W. M. Osborn, 1911-1912	W. E. Lyness, 1916
L. N. Jensen, 1913	J. F. Brandon, 1917
A. E. Seamans, 1914-1915	A. Osenburg, April and May, 1919

CEREAL CROPS AND DISEASES

Wilson G. Shelley, 1908-1911	George McMurdo, 1914-1917
Clyde McKee, 1911-1913	Franklin A. Coffman, 1917-1923
Charles H. Clark, 1913	

In the 19 years of its existence the Akron Field Station has determined the relative values of all available crops for the section it represents. It has also determined the best cultural methods, the best varieties, the best dates of seeding, and the best rates of seeding for the several crops. Progress has been made in breeding new and better varieties, marked success having attended this work with oats, corn and grain sorghums.

The trees best adapted for windbreaks and shelter-belts, and the fruits best adapted to the farm orchard have been determined.

The use of sheep for the utilization of crop residues on the dry farm has been investigated. This project was carried on in co-operation with Colorado Agricultural College. The water requirement of plants in a dry climate has been determined.

The fact that the Akron Field Station is one of the 24 field stations conducted by the Office of Dry Land Agriculture adds greatly to the value of the investigations carried on there. It participates in the benefits derived from the comparisons of the results obtained from all these stations.

Department Bulletin 1304 (March, 1925) is the most important review of results issued by the field station up to the present time. The title is "Crop Rotation and Cultural Methods at the Akron (Colorado) Field Station." It is by J. F. Brandon, associate agronomist, who is superintendent of the station. The period covered by this bulletin is 1909 to 1923 inclusive.

TREE PLANTING DEMONSTRATION.—Trees border two sides of the farm at Akron. These trees were planted for the purpose of demonstrating the fact that certain species were adaptable to non-irrigated regions. The original planting comprised 5,000 trees. The results indicate that American elm, hackberry, Austrian pine and western yellow pine are adaptable, though not equally so. Western yellow pine has proved the most effective for windbreak and shelter belt planting. Austrian pine has developed almost as well, but jack pine died out, indicating that under drouth conditions it is not hardy. The Russian olive, although hardy throughout the greater part of eastern Colorado, has suffered seriously at the Akron Station from winter killing. The Russian mulberry has survived only by protection from other trees.

Native cottonwood made a good growth during its early stages on the farm at Akron, but proved short-lived. Catalpa did not prove hardy. Scotch pine failed, after making considerable growth. Black locust, though one of the most hardy trees of eastern Colorado, is being forced to give way, due to black locust borer. Tamarisk, Russian apricot and the Siberian pea tree are apparently hardy, but they have not been tested long enough for definite recommendation. The tree planting demonstration is carried on in co-operation with the State Forester.

Field days are held annually at Akron, hundreds of farmers visiting the station, to note what progress is being made in crop tests and demonstration work.

The altitude of the station is 4,560 feet. The average annual precipitation for a fifteen-year period from 1908 to 1922 inclusive was 17.93 inches.

LIVESTOCK DISEASES AND POISONOUS PLANTS

The relation of veterinary medicine to the animal wealth of the state was recognized in the early days of the Agricultural College. A limited amount of experimental research respecting animal disease was carried on and the results carried to the farmers and stockmen through the college extension service. Later when the importance of animal disease investigation and control became better recognized, the work was given a wider scope and better support. The state has been fortunate in having at the head of veterinary work at Fort Collins, Dr. George H. Glover, whose ability is nationally recognized and who was honored in 1911 with the presidency of the American Veterinary Medical Association.

POISONOUS PLANTS.—The loss of stock on the ranges due to stock-poisoning plants has always been a serious economic problem. A co-operative investigation of loco weeds (with the Bureau of Animal Industry) with headquarters at Hugo, Colorado, was carried on for four years. It was found that horses, cattle and sheep acquire a habit for the plant with equal facility. After acquiring the habit other food is refused, and the characteristic symptoms are soon manifest. The nature of the poison in the plant, if there is any, has never been determined. A cure for the disease while animals still have access to the plant is, of course, absurd. The only solution of the problem appeared to be in keeping animals away from badly infested areas. Since they do not acquire the habit of eating loco weeds when plenty of other food is available, the problem of overstocking the ranges assumed greater significance. Since most of the losses are confined to the plains region east of the mountains, the ultimate solution of the problem will pertain to cultivation of the land.

Larkspur as a poisonous plant is second in importance only to the loco weeds. The several species of larkspur are confined mostly to the mountains and all are poisonous to cattle but not to sheep. On ranges where larkspur abounds it is no doubt responsible for fully 90 per cent of the aggregate losses from poisonous plants. The relative poisonous qualities of the different species, conditions under which poisoning is most likely to occur, identification and appropriate remedies, have been studied for several years, and the results given to farmers and stockmen of the state through various channels.

WHORLED MILKWEED.—The whorled milkweed ranks third in economic importance among the poisonous plants of Colorado. In 1916 some of the milkweeds were sent to the Agricultural College for examination by Dr. A. P. Drew of Grand Junction. He was sure that they were responsible for heavy losses of animals on the Western Slope. The first feeding

tests on rabbits were negative, probably because the weeds were only eaten sparingly. The following year sufficient quantity of the plants was secured from Grand Junction to feed experimentally upon larger animals. This and other tests which followed proved conclusively that this particular species of milkweed is a dangerous and deadly plant. It was found that while the loco weeds kill animals very slowly, and the larkspurs kill one here and there, the whorled milkweeds usually take a toll of more than 50 per cent of a flock of sheep in twenty-four hours. No suitable remedy was found and it is practically impossible to exterminate the weeds by cultivation. The county agricultural agents were given the responsibility of educating the sheep-herders to identify the plant, and danger notices were posted at practically all of the whorled milkweed patches.

OAK POISONING.—For several years there were reports of poisoning of livestock by oak leaves. Where autopsies were held the causes of death were either obscure, or could be assigned to causes other than oak leaves. In 1924 a feeding experiment was conducted at Walsenburg, which clearly demonstrated that the leaves of scrub oak are disastrous when fed as an exclusive ration. The toxicity of many range plants has been studied by chemical analysis and feeding experiments. It was apparent from the first that most of the poisoning happened in the absence of herdsmen, and for this reason the study of antidotes and remedial measures would have very little practical value. Of vastly greater importance were those things that pertain to prevention of poisoning, such as the easy identification of dangerous plants, conditions under which poisoning occurs, and in a general way, herd management.

PESTILENTIAL DISEASES.—The four great pestilential diseases of cattle are considered to be: rinderpest, contagious pleuro-pneumonia, tuberculosis, and foot-and-mouth disease. Possibly contagious abortion should be added to this list. The first mentioned disease has never appeared in this country. Contagious pleuro-pneumonia is an Oriental disease that at one time made its appearance in Illinois, but never in Colorado. Tuberculosis is found practically everywhere among animals and people. Among animals it works its greatest disaster in cattle, hogs and poultry.

Tuberculosis eradication now constitutes one of the leading projects of the Bureau of Animal Industry, and Colorado is co-operating, as are all of the states. Foot-and-mouth disease has appeared in this country seven times, and each time has been stamped out after the expenditure of several millions of dollars. It has, fortunately, never reached Colorado. If it were to become widely disseminated under the range conditions that prevail in Colorado, the disaster would be incalculable. In the year 1915 the National Western Stock Show at Denver was called off because of the

appearance of foot-and-mouth disease in the Mississippi Valley. The disease did not reach the Rocky Mountain region.

Other diseases which have been met and either mastered or minimized are glanders, the Kansas horse plague, blackleg and anthrax and brisket disease of cattle.

CONQUERING HOG CHOLERA

Unique in animal disease prevention is the plan followed in the San Luis Valley where pork production is an important industry which was in danger of being wiped out in 1912 through hog cholera. After being built up carefully to a point where it was the leading industry in the region, cholera swept through the herds and at the end of 1912 the farmers were broke, banks refused to loan another dollar on hogs, and it looked as though the production of pea-fed pork for which the San Luis Valley had become famous, would have to be abandoned. At this juncture Dr. George H. Glover was called to Monte Vista to advise the hog growers as to what to do in their emergency.

At a meeting in the old town hall at Monte Vista, January 10, 1913, Dr. Glover's idea for co-operative veterinary service was explained, accepted by the assembled farmers, and the Monte Vista Hog Growers' Association was organized to carry it into effect. The farmers raised \$800 at this first meeting to start the work, which meant cleaning up the hog lots of the entire valley, putting them in good sanitary condition and vaccinating all hogs with cholera prevention serum.

Dr. P. C. Guyselman, a graduate of the Veterinary Department of the Agricultural College, was called to Monte Vista from Denver, where he had been working as chief milk inspector. He was made a deputy sheriff, given a star, an automobile, instructions and quarantine notices. His work was successful from the start, the farmers co-operating readily in the preventive measures. The association grew until it included two counties, Rio Grande and Saguache, with a total membership of 300 hog raisers. Three veterinarians were employed, but later the association was divided, one being formed for each county.

While the Saguache County association has disbanded, that covering Rio Grande County is still in active operation, having a membership of nearly 200 and employing two veterinarians.

The total number of hogs vaccinated each year has ranged from 10,000 to 24,000, averaging about 16,000. The average annual expense for the association in Rio Grande County has been \$6,500 to \$7,500, and as this sum is distributed among so many farmers, it has been considered cheap insurance against hog cholera. The disease is constantly under control,

there being few outbreaks, those occurring being promptly met and mastered.

An auxiliary association was organized in the winter of 1914, known as the High Order of Grunts (H O G). An annual "hog banquet" is held at Monte Vista, the number of guests usually running from 500 to 700. Farmers and business men enter into the spirit of the occasion, which is made truly a notable affair in spite of the plebeian name of the organization.

U. S. BUREAU OF ANIMAL INDUSTRY.—The work of the state veterinarian in livestock disease prevention and control is mentioned in the chapter on the Range Livestock Industry. Mention should also be made of the work done in Colorado by the U. S. Bureau of Animal Industry. Inspection service has been maintained in the state since 1900 by this federal bureau, attention being given to scabies in sheep and to cattle mange, for the prevention of which dipping is practiced. Other lines of work carried on by the bureau through its Colorado branch, of which Dr. W. E. Howe is in charge, include hog cholera control, eradication of cattle tuberculosis, and inspection at the Denver Union Stockyards, to protect the interstate movement of livestock from disease and to prevent diseased stock from moving to other parts of Colorado. Close co-operation has always been maintained between the federal and state livestock disease control forces.

MUNICIPAL FOOD INSPECTION.—The college authorities have ever been mindful of conditions in Fort Collins which make for the health and happiness of the students. In 1907 the college herd of cattle was examined for tuberculosis and found badly diseased. Following this several herds of dairy cows supplying the city of Fort Collins with milk were found diseased. Through efforts of the veterinarians of the college an ordinance was passed providing for inspection of all foods. The success of Fort Collins in eradicating tuberculosis from her dairy herds, and in otherwise supervising the food supply, came to the notice of other cities in Colorado and elsewhere. Upon request hundreds of copies of the Fort Collins pure food ordinance have been sent to other cities and used as a basis for drafting ordinances suitable to local conditions. Veterinarians from the college have assisted in the preparation and passing of food ordinances in most of the cities of Colorado of more than 2,000 inhabitants.

SECTION OF VETERINARY PATHOLOGY

The Veterinary Pathology section was separated from that of Veterinary Medicine in 1918. The chief project during all the years since has been that in connection with losses of sheep in the feed lots. In the earlier

years attention was given to the study of hemorrhagic septicemia. This section was the first to show that that disease actually existed in Colorado sheep and made a study of the means of transmission and of control.

One bulletin and three journal articles were published giving such data as had been collected. The disease was shown to be chiefly concerned with exposure during transit and to occur very largely in the sheep within two weeks after the arrival of the lambs in the pens.

Following this, attention was given to paratyphoid dysentery, which became epidemic among the feeding lambs in 1923. The disease affected some 30,000 animals at that time, with a loss of over 6 per cent. The causative organism was isolated and with it the disease was reproduced. It was shown to have a direct relation to hunger in the sheep. In other words, the disease became serious only in lambs that had gone several days without food, although hunger itself did not produce the trouble. This was the first time this disease had been described in North America.

The great losses associated with heavy grain feeding both in the San Luis Valley where the lambs were eating peas, and in the corn and barley feeding districts of northern Colorado and the Arkansas Valley, have received much attention. While the cause of death in these cases has not been determined, it has been shown very clearly that high grain feeding is the essential factor, since cutting off the grain will at once stop the loss. This section has frequently pointed out the need for a more succulent ration and a more varied one, in order to reduce the amount of grain consumed. Since it became apparent that this malady was largely a question of ration, the co-operation of the Animal Husbandry Section was asked and has been freely given. That section has shown that by the addition of cull potatoes, peas may be fed with reasonable safety and that the addition of beet pulp, ensilage and other succulent materials will do much in reducing the loss in corn and barley-fed lambs.

A bulletin on Paratyphoid Dysentery and one on the Diseases of Colorado Feeding Lambs have resulted from these studies. The extension of the project to include some diseases of breeding animals has caused the section also to give attention to progressive pneumonia and icterohematuria. Both of these diseases seriously threaten the range sheep industry.

The work on contagious abortion was originally planned to show the value of a live organism vaccine. In recent years it has been concerned with developing a practical means of eradication of the disease by use of the blood test.

The study of poultry diseases has taken up much of the time of the section. In the earlier days, sod disease was described and a bulletin published with that title. More recently a great deal of attention has been

given to white diarrhoea. During 1925 over 11,000 blood tests were run for this disease. The department carries on a service agency, making diagnoses of all kinds, rendered to both the farmers and veterinarians. Thousands of specimens are received annually in the elaboration of this work.

Dr. I. E. Newson has been head of the section since its organization and during that time has been ably assisted by Doctors Floyd Cross and Wm. H. Feldman.

FEEDING TESTS WITH SHEEP AND CATTLE

The Animal Investigations section of the Colorado State Experiment Station has completed many experiments and series of tests dealing with livestock problems in the state. The section is under supervision of Pro-



Feeders' Day at the Agricultural College.

fessor George E. Morton, head of the Animal Husbandry Department, with E. J. Maynard conducting the research work.

Cooke tells of methods (Sheep Feeding in Colorado, Experiment Station Bulletin No. 32, 1895) in growing and fattening lambs in early days. "Most of the native sheep of Colorado are raised on the open range, with no shelter and but little extra feed through the winter." "Fattening lambs are usually fed nothing but hay (alfalfa) for two months, then a small

amount of grain, gradually increasing to full feed of one pound per head per day by the middle of March. A lamb eats about 400 pounds of hay and 120 pounds of grain."

Cooke investigated the practice of pasturing sheep on alfalfa (Experiment Station Bulletin 52, 1899) finding that with proper precautions old ewes and lambs could be pastured with about a 5 per cent loss by bloat.

Lamb feeding experiments by Buffum and Griffin (Experiment Station Bulletin 75) indicated the value of wet beet pulp in fattening lambs. In their tests "sugar beets did not prove to have a high feeding value for lambs." Two pounds of sugar beets were equal to one pound of wet beet pulp. Griffin (Experiment Station Bulletin No. 76, 1902) gives additional information concerning the good qualities of wet beet pulp for fattening lambs.

Cut alfalfa of good quality showed no advantages compared to whole alfalfa, with \$1.00 per ton charged for cutting, in ration experiments conducted by Carlyle and Morton (Experiment Station Bulletin 151, 1910). A comparison of alfalfa hay self-feeders with panels for feeding hay to lambs indicated a considerable saving by the self-feeders.

EXPERIMENTS BY MORTON.—Further experiments by Morton (Experiment Station Bulletin 187, 1913) substantiated the value of hay self-feeders over panels. In these tests a plump, full-kerneled barley was found to be as good as corn for fattening lambs. A light-kerneled, heavy-hulled barley, however, was found to have 10 per cent less feeding value than the heavier barley. Four years' work with cut alfalfa hay indicated that, although a saving resulted from the use of cut hay with good hay, the saving was fully offset by the cost of cutting the hay where the cost of cutting amounted to \$1.00 per ton.

Experiments with beet by-products for fattening lambs (Experiment Station Bulletin 266, 1921) showed that neither California feed barley nor oats were as efficient fattening grains as corn. Beet molasses was shown to be a good ingredient of the lamb-fattening ration. Dried molasses beet pulp, a commercial by-product of the sugar factories, was found to have a higher feeding value when fed in conjunction with corn than when fed alone.

More recent experiments have dealt principally with lamb-fattening problems and the comparative feeding value of the different feeds available in Colorado. Corn, corn fodder, corn silage, wet beet pulp, sunflower silage, corn and soy bean silage, cull potatoes, beet top silage, potato silage, dried beet pulp, dried molasses pulp, beet molasses, linseed oil meal, cottonseed meal, field peas and alfalfa hay have been used in different combinations to determine the most practical and efficient rations.

SAN LUIS VALLEY TESTS.—Feeding tests being conducted in the San Luis Valley are throwing light on lamb-feeding problems there. Extensive death losses on peas seem to be attributive to nutritional causes which can be remedied. The place of sheep on the dry land farm is being determined by experiments in eastern Colorado.

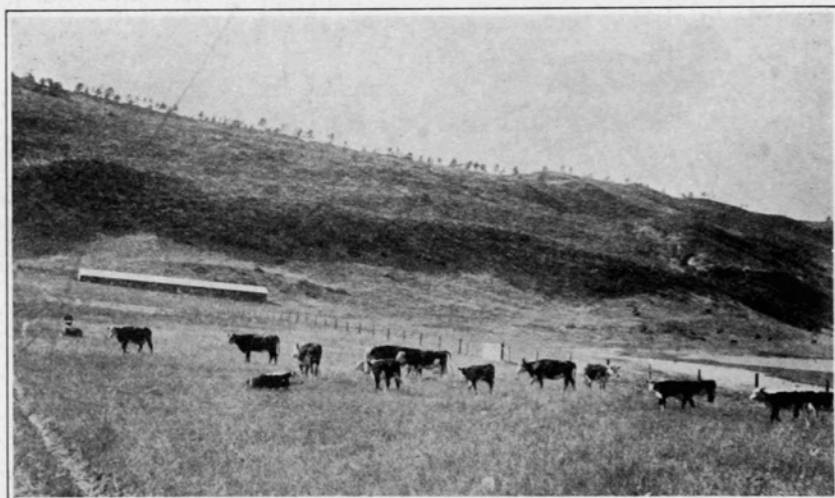
Early cattle-feeding experiments (Experiment Station Bulletins 97 and 102) indicated that wet beet pulp, when fed with alfalfa hay, made a well-balanced ration for fattening steers. The advisability of adding corn to this combination was indicated by these tests. For many years there was an unlimited supply of wet beet pulp for livestock feeders in the beet-growing districts. It was then and is now to some extent customary to feed a full feed of pulp to cattle. The increasing demand for wet beet pulp has cut down the allotment, however, so that only a limited amount (generally 25 per cent of the tonnage of beets produced) is available to each beet grower. More recent experiments, 1914-1926, have indicated most economical combinations of feed for utilizing a limited supply of beet pulp to cattle. Beet molasses, cottonseed cake, corn, corn silage, corn fodder and barley are some feeds that have been utilized to supplement the pulp fed.

CATTLE GROWERS' PROBLEMS.—Many cattle growers were encountering problems regarding the best age at which to market cattle and the advisability of winter feeding, using grain and alfalfa instead of native hay alone. In the fall of 1905 an experiment was started (Experiment Station Bulletin 149) which was designed to answer some of the following questions: Does it pay to winter feed as calves, as yearlings, and as twos, or would it be better to winter feed only as yearlings and twos, or only as twos? The results of this work showed that if the plan was to feed steers out at two years of age, winter feeding them as calves was not profitable, but it was advisable to feed them the two succeeding winters. It proved more economical, however, to winter feed as calves and finish as yearlings, than to winter feed as yearlings and finish as twos. The present general tendency to feed cattle out at earlier ages makes this system more attractive.

Feeding tests conducted at this time were planned to determine the value of sugar beets as a fattening feed for cattle. The beets were fed in the proportion of five pounds of beets to one pound of corn and half the corn was replaced by sugar beets. These tests indicated that sugar beets were a costly feed at prevailing prices and that it was more economical to grow the beets for sugar and feed the resultant by-products to livestock. By 1919 the growing scarcity of wet beet pulp, owing to increased demands

of beet growers, indicated a problem of finding rations suitable for fattening cattle without the use of wet beet pulp.

Other problems attacked at this time were a comparison of corn and barley and the cutting or grinding of alfalfa hay. These tests indicated that cattle could be successfully fattened on grain and alfalfa rations without the use of wet beet pulp, but that it was not possible to fatten them nearly as cheaply in this manner. Corn produced more rapid and econom-



Colorado Agricultural College foothills pasture, where range experimental work is carried on.

ical gains than barley in these tests. Cut or ground alfalfa did not prove as economical to feed as the whole alfalfa, and sugar beets did not make a satisfactory supplement to the fattening ration.

COST OF BEEF PRODUCTION.—An experiment on cost of beef production under semi-range conditions is reported in Experiment Station Bulletin 189. A series of feeding experiments (unpublished data) 1914 to '18, were chiefly concerned with finding the fattening value of wet beet pulp, beet molasses, corn silage, cottonseed cake and alfalfa. Beet top silage was found to be generally unsatisfactory as a cattle-fattening feed in Colorado, in a series of tests conducted between 1918 and 1921. These tests indicated also that dried molasses pulp had a comparatively low feeding value for fattening cattle when used as the lone carbohydrate. Beet tops were shown to have a high feeding value for fattening cattle. Corn silage proved to be less efficient than wet beet pulp in a ration of beet molasses, cottonseed cake and alfalfa. Alfalfa hay fed alone gave such poor results

as to indicate that at no time under present conditions would such a ration be advisable. All factors considered, pasturing beet tops, piled in small piles in the field, seemed more advisable than drying them and hauling them to the feedlot or ensiling them.

In a series of tests (1921 to 1924 inclusive) sunflower silage was found to have approximately 66 per cent the feeding value of corn silage pound for pound. It proved to be a good feed when cut and ensiled at the right stage. In these same tests dried molasses beet pulp showed a high feeding value compared with corn when fed with ensilage, cottonseed cake, and alfalfa. The present series of cattle-feeding tests has to do with developing rations for fattening off calves under Colorado conditions.

Early feeding tests with swine (Experiment Station Bulletin 74) indicated that home-grown grains, fed in proper proportions to balance the ration, were more valuable than corn. Sugar beets either fed alone or in combination with grain, proved unprofitable. The general conclusion in this bulletin was that there is enough feed at home, including grain, alfalfa pasture, by-products of dairies and beet sugar factories, to make swine growing and fattening a profitable industry on Colorado farms. Carlyle and Morton (Experiment Station Bulletin 165, 1910) conducted swine feeding tests with sugar beets, alfalfa, barley, wheat, shorts, peas and tankage.

RESEARCH IN IRRIGATION

When the Department of Irrigation Engineering was established most of the irrigation ditches in the state had been built. Consequently, the department had little to do in developing or constructing these ditches. Irrigation of the arid lands at that time was a demonstrated success and the first problems of the department were those caused by the over-appropriation of the water in many of our streams, and also the development of certain crops that require irrigation late in the season. These crops were principally potatoes and sugar beets. The rivers are mountain streams and are, therefore, subject to heavy flood flow in the spring and early summer with a very small flow in the late summer and fall. This caused a surplus of water in the spring and early summer and a deficiency, for the ditches then constructed, in the late summer and fall. The construction of reservoirs was, of course, the solution for this condition of affairs. Many reservoirs were constructed and the department offered valuable assistance in the survey, the design of the outlet structures and control valves for the reservoirs and the design of the reservoir dams.

STUDY OF THE RUN-OFF.—A study of the run-off from the watersheds of our streams was, of course, a necessary thing in order to ascertain

whether or not there would be sufficient water from the stream to fill the reservoirs located on its watershed. The study of the run-off of the streams in Colorado was carried on for a period of many years by this department. These data become more and more valuable with the years, for the run-off is a variable quantity and fluctuates from year to year and apparently has cycles of large run-off and cycles of small run-off. Finally the burden of keeping these records was taken over jointly by the State Engineer's Office and the United States Geological Survey, and the records are still being kept by these two organizations.

Because of the close relation existing between meteorology and irrigation, there has been kept a continuous record of the weather and other meteorological data since 1887. Several weather bulletins have been published setting forth extremes, means, normals and other data of value and interest. Recent information seems to indicate that the record of the evaporation from a free water surface, taken at this station, is one of the longest continuous records in this country. These were first begun in 1887 and have been carried on without interruption to date. Snow studies on the high mountains, from the standpoint of water supply, have been made.

RETURN FLOW BULLETIN.—The next study of importance attempted by this department was the return flow to streams, as shown in Bulletin No. 180 and 279. This subject is discussed in the chapter on Irrigation. The South Platte River, from the point where it leaves the canon to the state line, supplies more than three times the amount of water to the ditches along the way than would be supplied by the amount coming out of the canon. Practically all of our rivers are affected the same way by the irrigation of lands on their watersheds. A number of irrigation systems were constructed in the early days and proved to be of little value because of the lack of water, whereas there is ample water now for these systems, due to this return flow. The department has attempted to measure this return flow of water, and all of the data gathered has been published in the above-mentioned bulletins.

The department has done a great deal of work along the line of the measurement of water by means of the current meter, the weir, and the Venturi flume. Bulletin No. 150 covers a part of this phase of the work and Bulletin No. 265 covers the subject of the Venturi flume, which is a device for measuring water in ditches having a low velocity and flat slope, or ditches where the water carries a large amount of sediment that would collect in front of the weir check. The flume is now used in various places in the western United States and foreign countries.

Ordinarily many farmers draw water through the same lateral, and it is necessary to divide this water proportionately to the different farmers.

Devices for doing this are called "divisors" and Bulletin No. 228 gives the design and construction of these structures for dividing water in this way. As the years have gone by the temporary wooden structures in our irrigation ditches, constructed at the time they were built, have been replaced by permanent masonry or concrete structures, and the department has done a great deal in recommending the proper design and proper construction for headgates, flumes, drops and all other structures used on an irrigation system.

DUTY OF WATER.—It has always been noticed that in some parts of the irrigated sections in Colorado the science of applying water to the fields has advanced more rapidly than it has in other sections and the water is made to go much farther. Probably in the Poudre Valley farmers get the best "duty of water" of any place in the state and a good deal of time and money have been spent to ascertain just what the duty of water is in this section. The work has not given very definite results, due to variations of soils, seasonal climate, skill of different irrigators and the difficulty of maintaining accurate measurements at all times on the ditches.

The department has also given considerable time and effort to the loss of water through seepage in our canals. The effect of these canal losses upon the adjoining lands and the control of these losses have also been studied. Canal linings to prevent them have been studied and drainage systems installed to relieve the wet condition of the seeped lands. Considerable work has been done to demonstrate the advisability of drainage in these sections of the state.

Frictional resistance to flowing water in different canal structures and in different materials forming the bed of ditches is the subject of a study published in Bulletin No. 194.

During the last few years the department has co-operated with the State Highway Commission in a study of materials suitable for surfacing the roads of the state. A survey has recently been completed to determine where these road materials exist near primary road lines and the deposits have been located, mapped and the amount of material available ascertained and its suitability for surfacing determined. A report of road materials available in the state is given in Bulletin 284.

Staff men engaged in irrigation investigations are Ralph L. Parshall, Robert E. Trimble and Carl Rohwer. The road materials work is in charge of O. V. Adams.

WORK IN ENTOMOLOGY

The State Board of Agriculture, at its December meeting, 1890, established the Department of Zoology, Entomology and Physiology, and C. P.

Gillette, who was then entomologist of the Iowa Experiment Station, was called to take charge of the department. At that time he did all the work of teaching and experimentation. Since 1907 the head of the department, because of action of the State Legislature, has also been State Entomologist, charged with the control of insect pests and plant diseases in Colorado.

The active experimental work in entomology began in the summer of 1891 with the study of the Mexican bean beetle, the fruit-tree leaf-roller, the box elder leaf-roller and the codling moth. At this date the codling moth was beginning to assume importance as a pest to apple and pear growers in eastern Colorado, and also in the vicinity of Grand Junction on the Western Slope. It had not yet found its way into the orchards of Delta and Montrose counties. Later, investigations were undertaken to determine what species of grasshoppers occurred within the state and to work out practical methods for their control. This resulted in a report, Bulletin 233, upon grasshoppers of the state, and in several bulletins giving methods of control, the best so far used being the arsenic-bran-mash formula.

Still later, the plant lice or aphids came in for special attention, both for the purpose of determining the plants upon which the different species feed and the methods that can best be used to prevent their injuries to plants.

ALFALFA WEEVIL APPEARS.—In the summer of 1917 the alfalfa weevil was discovered in Delta County by J. H. Newton, who was stationed at Paonia to represent the office of the State Entomologist in that section. Much time and effort have been given for the purpose of preventing the spread of this insect to other sections of the state, and also to determine best methods for its control. The introduction of a parasite (*Pathoplectes curculionis*) has done much to lessen the numbers of this very serious pest and hold it in check.

ERADICATING PRAIRIE DOGS.—The Colorado Pest Act (Chapter 95, Session Laws of 1915) provided for the control of other pests such as prairie dogs, jackrabbits, gophers and noxious weeds, under the direction of the State Entomologist. The rodent control work has been in direct charge of W. L. Burnett, who developed "Colorado Formula No. 46" for the poisoning of rodents, which has met with almost phenomenal success in the destruction, especially, of prairie dogs, gophers and jackrabbits. For example, in Weld County, where prairie dogs were very numerous in the dry-farming areas, by use of this formula they were exterminated except in two or three small untreated districts. In that county alone fully 1,000,000 acres were treated and not less than 8,000,000 prairie dogs destroyed, resulting in a very great saving to the ranchmen in pasturage.

In 1913 the General Assembly passed an act (Senate Bill 169) for the control of bee diseases and the promotion of the bee-keeping industry in the state and charged the State Entomologist with its enforcement. Much has been accomplished in this line. In 1925 diseased colonies in the state had dropped to 2.8 per cent.

The more important results of the work of the department have been published in station bulletins and in circulars from the office of the State Entomologist. The success in the control of prairie dogs and jackrabbits alone has undoubtedly saved the people of the state many times over what it has cost to maintain the department in all lines of its work. The work with insect pests has probably done even better.

A very effective method for the control of the poisonous whorled milkweed was worked out by W. L. May, which has also resulted in a very large saving to the farmer from losses in sheep and other livestock that eat this plant, especially on the Western Slope.

The work done, especially by George M. List and those who have assisted him, to determine the life habits of the codling moth has been of great service to the apple and pear growers of the state in enabling them to use the best methods for the control of this insect pest.

RESEARCH IN FARM ECONOMICS

Five research projects have been developed by the Department of Economics and Sociology. In the field of farm management and farm organization two phases of work have been developed. One of these has involved the matter of securing farm business analysis records by personal interview; the other has been developed on the basis of keeping detailed farm business records day by day. These records have been checked by repeated visits of a member of the department. Preliminary reports on the costs and returns from sheep and cattle feeding have been issued from time to time during the past three years. Similar reports on the cost of producing crops for three years have been published and distributed. The results of these studies have been followed with considerable interest by farmers in northern Colorado and they have been used in various ways to aid in securing adjustments in the farmers' dealings, both with the government and with industry, also in changing their own plans to increase the profitableness of their business.

A co-operative project has also been carried during the past three years with the Division of Farm Management and Costs of the United States Department of Agriculture, in the study of economic methods of range livestock production in Colorado. The results of this investigation have been published in several reports on cattle and sheep. This information

has been utilized by a large number of producers in Colorado and other western states, in the organization and operation of their ranches. These cost reports have also been used by both state and national legislators in deciding agricultural policies with respect to the use of the national forest ranges and open public ranges, which have played so conspicuous a part in the picturesque history of the range-livestock industry of Colorado. Stockmen have used these data before the Interstate Commerce Commission in a successful attempt to obtain reasonable transportation charges on range livestock. The excellent results obtained from the pioneer work in Colorado has led to similar studies being initiated in several other western states.

During the past three or four years the Department of Economics and Sociology has co-operated with the Colorado Division of Markets in Denver. The major study during this period has dealt with the harvesting and marketing of cantaloupes and honeydew melons in the Arkansas Valley.

RESEARCH IN BOTANY

From 1909 to 1914 B. O. Longyear was acting botanist and during that time published the following bulletins:

- Some Colorado Mushrooms—201.
- The Dandelion in Colorado—236.

In 1915 W. W. Robbins was station botanist, holding that position until 1919. The following bulletins were published during that period:

- Colorado Plants Injurious to Livestock—211.
- Fungus Diseases of Colorado Plants—212.
- Native Vegetation and Climate of Colorado in Their Relation to Agriculture—224.
- Cleaned, Treated and Tested Seed for Colorado—238.
- Millet Smuts and Their Control—242.
- A New Poisonous Plant, the Whorled Milkweed—246.
- Alfalfa Dodder in Colorado—248.
- Irrigation Water as a Factor in Dissemination of Weed Seeds—253.

In 1920 Dr. A. K. Peitersen was station botanist, and during his incumbency the following bulletins were published from the botanical section:

- Whorled Milkweed—255.
- Colorado Plant Diseases—259.
- Perennial Peppergrass—264.

Dr. L. W. Durrell took charge in 1924, at which time the projects were reorganized as follows: Range improvement, co-operative with animal husbandry.

Alfalfa root rot project co-operative with bacteriology.

Physiology of seed project—covering a study of hard seeds of alfalfa; cracked seed of wheat and injured seed of sorghums.

Truck crop diseases and cereal diseases. Under this project the following studies have been made: The rust relations of our mountain barberry; the overwintering of red spores of wheat rust; testing of Colorado wheat crosses for rust; experiments have been conducted the last two years on stinking smut of wheat; about 2,000 plots, representing various treatments, have been planted in several localities in the state.

In addition to the above projects, work has been carried on since 1918 in the eradication of the common barberry, the management of which work was centered in this department. The past year co-operative work on weed eradication was begun jointly with the State Entomologist.

Miscellaneous physiological studies have been carried on by members of the department as follows: The effect of surface tension on germination of fungus spores; a study of the effect of plant tissue on the germination of corn smut spores; the influence of acids and oxygen on the germination of corn smut spores.

Aside from a number of scientific papers published in various technical journals, members of the botany section have contributed to the practical agricultural literature of Colorado within the last year three extension circulars covering the subject of smut prevention in grains through the use of the copper carbonate dust treatment and also the following bulletins: "Common Weeds of Colorado Lawns," Bulletin 310, L. W. Durrell; "Eradicating Bindweed and Poverty Weeds," Bulletin 313, L. W. Durrell and C. F. Rogers; and a "Handbook on Botany" for use of agricultural workers.

SEED TESTING LABORATORY

The Colorado pure seed law, which is administered by the Agricultural College, under the supervision of the Botany Department, was passed by the Twenty-first General Assembly. Its purpose is to regulate the sale and importation of field and garden seeds and to provide for the testing of such seeds. Through seed testing, which is done free for farmers, the spread of noxious weeds is prevented and the sale of adulterated seed, or that low in percentage of germination, is kept at a minimum. The law does not require a farmer to purchase seed of any particular quality. He may buy inferior seed if he so chooses, but this must be labeled so that he may know what he is buying.

The law became effective April 10, 1917. It requires the labeling of all field seeds sold or offered or exposed for sale, either in bulk, packages or other containers of five pounds or more. The label must show the kind

of seed, the variety, purity, its germination, date of test, where grown and the name and number of noxious weeds in excess of a certain quantity. The Colorado seed laboratory is in charge of Anna M. Lute, seed analyst.

RESEARCH IN HORTICULTURE

The Department of Horticulture maintains a close contact with the growers in the field, both by personal visits and through meetings held at various times and also by correspondence. The growers' problems are constantly being studied, both in the field and in the laboratory, and the results of these experiments are disseminated through experiment station bulletins. These publications deal in general with problems with which the grower meets in the business, and are thus of direct value. Among the bulletins published during the last thirteen years are the following: "The Reclamation of Niter Soil in the Grand Valley," "Fruit Growing in Colorado," "Hardy Apples in Northern Colorado," "Beautifying the Home Grounds," two dealing with vegetable production, four dealing with the tree fruit industry, three dealing with the potato industry, a bulletin on "Tip-Burn of Lettuce" and one on "Orchard Management."

At present the following lines of experimental work are in progress: Improvement of potato varieties; the selection of seed peas; fertilizer experiments with vegetables, particularly head lettuce and tomatoes; selection of disease-resistant squashes; celery storage; problems in orchard management, particularly with regard to cover crops.

The horticultural department operates an experimental and demonstration orchard at Austin, where the problems of the fruit growers are studied and worked out and where the best orchard methods are practiced. Growers are making constant use of the orchard, both in obtaining specific information and in watching the results.

The department also maintains a vegetable demonstration and experimental farm at Avon, at an altitude of 7,500 feet. Here the best methods in commercial vegetable production in high altitudes are studied and experiments in seed production, variety tests and in the use of commercial fertilizers are being conducted. This farm consists of 100 acres under cultivation, and the work is on the basis of commercial production. Experiments dealing with the growing of tomatoes for canning factories are carried on at Manzanola and experiments in storing celery at Littleton.

At the home garden at Fort Collins extensive variety tests with celery are in progress. Breeding and selection of disease-resistant varieties of squashes, the growing of Spanish onions and variety tests of vegetables and small fruits are carried on.

Dr. E. P. Sandsten is head of the department and in that capacity has charge of experimental work. He is also the state horticulturist.

HOME ECONOMICS RESEARCH

The research that occupied the major part of the time in the Home Economics section of the experiment station, during the period 1919-1925, was the study of variations in the composition and cooking qualities of standard varieties of Colorado-grown potatoes.

The varieties studied were the Burbank, Rural, Brown Beauty, Downing, Pearl, King, Ohio, Irish Cobbler, Peach Blow, Blue Victor, Gold Coin, Late Rose and Triumph. These were variously obtained during the years 1919-1924 from lots grown under irrigation and on dry land in several districts of the state. The districts largely represented were the San Luis Valley, Carbondale, Greeley, Briggsdale and the Arkansas Divide.

Observations of practical value to the grower and the housewife as a result of this study are as follows:

The size of a potato is no criterion of its maturity.

Potatoes which have had the longest growing season are the most mature.

The quality of potatoes seems to depend more upon the grower, soil and season than upon variety.

Two bulletins were the result of the potato research by Dr. Nellie E. Goldthwait: Bulletin No. 296, "Variations in the Composition of Colorado Potatoes," and Bulletin No. 297, "Potatoes from the Housekeeper's Standpoint."

Bulletin No. 298, "Principles of Making Fruit Jellies," is a revision of a similar bulletin written by the author for the University of Illinois in 1908-11. Incorporated in the revision are the results of her examination of Colorado fruits with respect to their jelly-making properties.

EXPERIMENTAL WORK IN FORESTRY

Since the professor of forestry of the Colorado Agricultural College is ex-officio state forester of Colorado, the work of the Department of Forestry and the activities of the state forester are intermingled. The office was established in 1911 with Professor B. O. Longyear in charge. He outlined a number of experiments and investigations, which have been carried on in association with his successor, Professor W. J. Morrill, Professor Longyear continuing in the department. Among these investigations are (1) a study of the tree species best adapted to planting in the plains region of eastern Colorado, (2) the preservation of fence posts, methods, preservatives and results to date.

In connection with the study of the trees most successfully planted in eastern Colorado, the state forester furnishes at cost seedling stock to the

ranchmen, from 70,000 to 100,000 trees being sent out each of the past five years. These are planted in groves, windbreaks and for beautifying the farm homes, relieving the bleakness and monotony of the landscape of the plains, besides furnishing wood, posts, shelter and nesting places for insectivorous birds and, in general, adding to the appreciation of rural life as well as the sale value of the property improved by the planting.

A surprisingly high percentage of these tree seedlings survive, at least for a few years. On 112 irrigated ranches 73 per cent of nearly 10,000 young trees of which records were made survived. One hundred thirty-three planters on non-irrigated lands in eastern Colorado, planting 11,689 seedlings of ten species, report survival of 59 per cent.

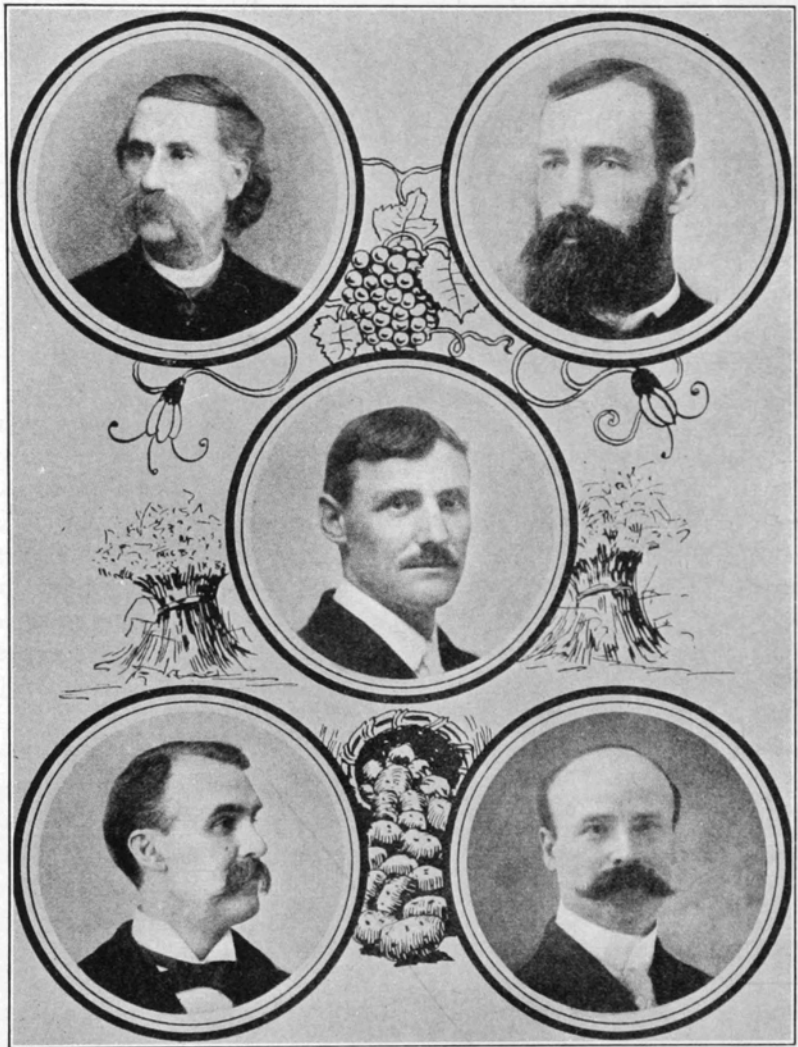
The results point to the conclusions that practically any area in Colorado capable of supporting a home by cultivation of the soil, is also suited to the growing of one or more hardy species of ornamental or forest trees, when given proper protection and care.

Native round fence posts, cut in the mountains, of such common materials as lodgepole pine, Engelmann spruce and Alpine fir, were treated with crude water-gas tar creosote, such as can be obtained as a by-product in gas plants in several cities of the state at small expense per gallon or barrel. A high percentage of these posts are still in service after thirteen years, while the untreated similar posts failed after five years. Time has not elapsed to enable one to give exact results, but enough is now known to assure the farmer that home-creosoted fence posts will cut the annual expense of posts in half, if creosote can be purchased economically.

MECHANICAL ENGINEERING RESEARCH

The Mechanical Engineering section of the experiment station has undertaken several important projects in the last five years, some of which have a direct bearing on the state's agriculture. Among the latter may be mentioned the subjects of protection of hay in the stack and methods of handling hay. The results of these investigations are incorporated in Bulletin 281 by G. A. Cumings. As hay is one of Colorado's important crops, information on curing, stacking, protecting and measuring hay is of vital interest.

Another project undertaken by this division is that relating to "Treatment of Alkali and Other Waters for Domestic Use." As alkali water is found in practically every section of the state, efforts to find an economical method of treatment to make such water less harmful are of general interest. The conclusions drawn from this investigation were that deep wells, either for an individual farm or for a community, often solve the alkali problem. Also that purification by condensation is the only method by which alkali water may be made potable.



*Presidents of the State Agricultural College: E. E. Edwards, Charles L. Ingersoll,
Charles A. Lory, Alston Ellis, Barton O. Aylesworth.*

CHAPTER XV

Agricultural Education

HISTORY OF COLORADO AGRICULTURAL COLLEGE

THE LAND GRANT LAW.—To Justin S. Morrill of Vermont is due the honor of having led the movement that resulted in the establishment of our state colleges of agriculture and mechanic arts. His two first efforts in 1856 were unsuccessful. What is known as the "First Morrill Act" of 1862 provided a grant of 30,000 acres of public lands for each senator and representative in Congress for the endowment of a college of agriculture and mechanic arts. This grant was made conditional upon each state accepting the terms of the act, one of which provided for land, buildings, equipment and maintenance over and above the income from the special land grants. This act further provided that the object of these land grant colleges shall be, "without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

LOCATION FIXED IN 1870.—An act of the Territorial Legislature of February, 1870, nominally established an agricultural college and fixed the location at Fort Collins:

Section 1. There shall be established an agricultural college to be called and named the Agricultural College of Colorado, which college shall be located in the County of Larimer, at or near Fort Collins.

Section 2. James W. Smith, Timothy M. Smith, John Wheeler, Hugh Munson, Jesse M. Sherwood, B. T. Whedbee, Samuel Ashcraft, H. B. Bearce, G. Berkley, J. T. Lynch, M. Lucero and Samuel H. Elbert, are hereby appointed trustees of said Agricultural College of Colorado.

There was a provision empowering the trustees to purchase "all necessary personal property," and to provide for the erection of buildings, to organize the college and to employ "a sufficient number of professors and tutors," but no appropriation was made for these purposes, hence the trustees were unable to carry out this provision. However, the enactment had been passed in anticipation of a donation of 240 acres of land adjoining the Fort Collins townsite on the south. The donors were Arthur H. Patterson, 80 acres; Robert Dalzell, 30 acres; Joseph Mason, H. C. Peter-

son and J. C. Mathews, jointly, 30 acres, and the Larimer County Improvement Company, 80 acres. The deeds were executed at various dates in January, 1871, December, 1872, and January, 1873. Thus the territorial government came into possession of the land upon which the college was later established.

While this land had little cash value in that early day, it was proof, nevertheless, that citizens of Fort Collins were doing their part in the effort to establish the institution by providing a suitable site without cost to the territory.

The legislature in 1872 amended the law of 1870 by naming a new board of trustees, the amended act, signed February 9 of that year, listing the following in lieu of the first named board: T. M. Smith, H. C. Peterson, J. M. Sherwood, B. H. Eaton, A. H. De France, Samuel H. Elbert, J. Marshall Paul, A. F. Howes, Granville Berkley, A. K. Yount, George M. Chilcott and B. T. Whedbee.

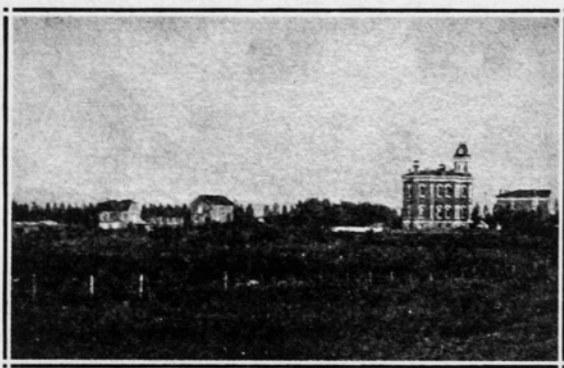
FIRST APPROPRIATION \$1,000.—Two years again elapsed before another step was taken toward founding the institution, the next enactment being one signed by the governor of the territory February 11, 1874, making an appropriation of \$1,000, to aid in erecting buildings and making other improvements "on the grounds now belonging to said institution." This sum was to become available after the trustees should have expended an equal amount, "raised by subscription, donation or otherwise." Senator N. H. Meldrum of Larimer County was the author of this, the first college appropriation measure.

CHRISTMAS TREE NETS \$80.—The Fort Collins Town Company raised part of the money by selling lots; the Grange and citizens did the rest, and \$2,000 was made available. The first money secured in support of the college was raised through the patronage of an old-fashioned "Christmas tree," which netted \$80. This occurred before the passage of the appropriation bill.

With the fund now made available, construction began by building a five-board fence around forty acres of the donated land and a brick building, 14x28 feet in dimensions, east of the building now occupied by the Conservatory of Music. This building was first used as a tool house, later as a "bachelors' hall," then as a chemical laboratory. At one time it was occupied by the president of the college and his family of seven. It is interesting to note in this connection that the territorial act of 1874 provided, in Section 5, that: "Each county in this territory shall be entitled to send to said college, tuition free, one pupil; said pupil to be selected by competitive examination before the county superintendent and awarded to the highest scholarship."

After the forty-acre tract had been fenced it was farmed by different individuals, and in the spring of 1875 Fort Collins Grange, Patrons of Husbandry, turned out in force with plows, harrows and seed grain and sowed a part of the adjoining eighty acres to wheat. In the fall they harvested and threshed 67 bushels, which was stored in the first building erected on the campus. When the college opened in September, 1879, this building was made the nucleus of the Department of Horticulture, and a greenhouse was attached to it for the purpose of growing flowers and vegetables.

STATE ASSUMES CONTROL.—The constitution of Colorado, as adopted in 1876, provided that "the Agricultural College at Fort Collins" should become an institution of the State of Colorado and be subject to the control of the State. At that time the state found itself in possession of the 240 acres of land, forty acres of it fenced and one small building thereon, in use as a granary for the crop grown by the grange on the adjoining 80-acre tract in 1875.



View of the State Agricultural College in its pioneer years.

The First General Assembly of the state, acting under provisions of the constitution, by an act approved February 27, 1877, created the State Board of Agriculture, to be composed of eight appointed members, with the governor of the state and the president of the college to be members ex-officio. This act provided that the trustees of the agricultural college who had served under territorial enactment should convey by deed to the new board title to all real estate held in trust for the college and also transfer all other property. With considerable enlargements of power, the Board of Agriculture still exists as the governing board of the college.

FIRST BOARD OF AGRICULTURE.—The first State Board of Agriculture, appointed by Governor John L. Routt, was composed of N. W. Everett, Jefferson County; John Armour, Arapahoe County; B. S. LaGrange, Weld County; P. M. Hinman, Boulder County and William A. Bean, John J. Ryan, Harris Stratton and W. F. Watrous of Larimer County. The first

official meeting was held at Denver in March, 1877, where W. F. Watrous was chosen president and Harris Stratton secretary.

The first State General Assembly met in Denver in January, 1877. Larimer County was represented in the House by N. C. Alford and in the Senate by N. H. Meldrum. They secured the passage of an act authorizing the levy of one-tenth of a mill on the assessed property of the state, to provide a fund for use in erecting a suitable building in which to open the college.

In recalling his activities at that session, Mr. Alford related the following incident: "I found, on a close canvass of the members of the House, that I lacked one vote of having strength enough to put the measure through. I labored more than half of one night trying to get Jim Carlisle at Pueblo to promise to vote for the bill. Finally, whether because he was tired of my urging or because he wanted to go to bed, he promised to vote for the bill, remarking, 'I feel as if it was throwing the money away, for you never can make Colorado an agricultural state. It is only fit for a cow pasture and for mining.'"

The bill passed the House and went through the Senate without trouble and received the signature of Governor John L. Routt.

THOUGHT COLLEGE A JOKE.—W. F. Watrous, the first president of the board, several years later, in a letter addressed to Dr. Alston Ellis, made the following interesting comment: "When an article was agreed upon, locating the State Agricultural College at Fort Collins, representatives from other localities did not consider their loss irreparable or Fort Collins' emolument beyond compare. The affair was looked upon as something in the nature of a burlesque. A school for the promotion of agricultural science and the mechanic arts, located in the Great American Desert, with nothing in sight more suggestive of enlightened civilization than dry prairies, dotted with cactus patches, bestrewn with bleaching bones of departed buffalo, and inhabited by prairie dogs, coyotes and buzzards, with only here and there a little oasis along the creek bottoms, was an enterprise that was considered both amusing and pathetic." He states, however, that several years later, after its importance began to be appreciated, it required considerable "alert watchfulness" to prevent it from being removed elsewhere.

OLD MAIN COST \$7,000.—In 1878 the legislature made a continuing appropriation of one-tenth of a mill for the support of the college, but as this only provided about \$4,000 per annum, it was held over until the second installment became due, when a contract was let to H. C. Baker of Boulder to construct the "Old Main" for \$7,000. George King of

Boulder was the architect, and ground was broken on the 20th day of June, 1878.

After many difficulties and the loss of considerable money in construction, the building was completed, and the legislature in the winter of 1878-9 increased the appropriation from one-tenth to one-fifth of a mill, but the Senate killed the bill which provided for \$3,000 for opening the college the following September. In this emergency the friends of the college sought to borrow \$2,000 from the state, but this at first seemed impossible, since the time had passed for the introduction of bills. At last a way was found whereby this might be accomplished. The "deadhead" special appropriation bill was resurrected, given a new rider, rushed through both houses and became a law.

The cornerstone was laid with Masonic honors on the 29th day of July, 1878. The report of the secretary of the Board of Agriculture, Hon. Harris Stratton, contains a lengthy account of the laying of the cornerstone, the address of Mr. J. C. Shattuck, state superintendent of public instruction, and recites the seemingly insurmountable difficulties that were met before the college doors were finally thrown open for the reception of students September 1, 1879.

CORNERSTONE LAYING.—Mr. Stratton's account of the laying of the cornerstone appears under the caption, "A Fete-Day of the Agriculturists." He says: "Yesterday was a proud day for the town of Fort Collins and the county of Larimer, and a day fraught with importance to the entire state, if the enterprise which was formally set on foot brings forth its legitimate fruit. It was really refreshing to see the crowd—such a crowd as one cannot see in every part of Colorado, and that reminds one of the turnouts that are met within the agricultural regions of the trans-Mississippi states. A string of wagons forming a procession at least four hundred yards long, occupied by good-natured and rotund ranchmen, and their wives, and sons, and daughters, all looking robust, agreeable and prosperous, and intelligent—a descriptive adjective which cannot always be applied to gatherings of the kind in the East. The only drawback was the unfavorable weather. For once the farmers had rain that they did not appreciate. The rain commenced just at the time when the ceremonies were to begin and continued until they had been brought to a close. Notwithstanding this drawback, however, not one who came to witness the laying of the cornerstone sought to shun the wet, or missed the sight, the prospect of which had attracted them to the spot, showing that the people about Fort Collins are people of grit as well as of intelligence."

SHATTUCK DELIVERS ORATION.—The orator of the day was State Superintendent J. C. Shattuck. After fifty years it is instructive to read

the thoughts expressed by a Colorado farmer and educator of the pioneer days. What he and others were thinking and hoping when the foundation was being laid for the first building in which instruction was given on the ample grounds where now a large group of buildings serve the purposes of teaching and research, has unusual historical interest, as the following extracts must be permitted to indicate:

MODERNIZING AGRICULTURE.—While agriculture is one of the oldest of human occupations, it is a strange fact that its improved methods, and especially its improved implements, are of very modern origin. The nation that gave the world the parthenon and the Iliad plowed its fields with a pointed stick. Rome created literature that is still the admiration of the world; she carried the manufacture of warlike implements to a point hardly surpassed today, except such new forms as the use of gunpowder has required; but her implements of agriculture were scarcely superior to those of the now forgotten race whom Pizarro conquered among the mountains of Peru.

Up to the middle of the last century the grain of the world was still thrashed in the manner to which Moses referred when he wrote: "Thou shalt not muzzle the ox that treadeth out the corn;" and it is only about eighty years since the farmers of England and America began using plows with both mold-board and land-side of iron. Indeed, so young is the art of agricultural implement manufacture that in the fields of wide-awake farmers today you will hardly find a tool that is not—at least in its present form—the invention of the present generation. The English-speaking race, in a remarkable degree, has led the van in this department of advancing civilization. In the Agricultural Department of the Centennial Exposition, continental Europe exhibited an assortment of clumsy implements which a Yankee farmer would not use if given to him, among which I searched eagerly for one tool, simple or complex, that England or America had not anticipated and improved. I found only a hollow leathern tube which the farmers of Southern Russia used to relieve an animal when choking. * * * I do not see how any one could walk through the Agricultural Department at Philadelphia and avoid the conviction that, in all that pertains to brain-work in agriculture, the English-speaking race is far in advance of all others * * *.

BOTH BRAIN AND BRAWN.—Much has been written and spoken of late years of the dignity of labor, and England and America have done more to give dignity to labor than all other nations of the earth, because they have put more brains into agriculture. I take the risk of shocking the notions of some people when I say that there is not a particle of dignity in manual labor alone. If such be in itself ennobling, then the peasant woman of Europe, yoked in the field beside a cow * * * has reached the acme of human dignity. Would it be elevating for a farmer to go into his grain-field today with a sickle, and by dint of hard work and long days, cut and bind an acre a day, when, with a pair of horses and self-binding reaper, he can accomplish the same in an hour? The one is muscle, pure and simple; the other is muscle under the control of an intelligent brain. * * *

Farmers of Colorado, this stone which you are laying today is something grander far than the simple corner of a modest building of brick and stone. It is another monument of the emancipation of your guild. May it be the guidon of greater triumphs than any yet achieved.

That of all laws ever enacted, either State or National, for the advancement of practical education, no one has ever been productive of such fruitful results. The originators and framers of this law "builed better than they knew." No tabulated statement can give more than a faint idea of what has been done in a short space of time in advancing agricultural education. * * * Up to 1865 the Agricultural College of Lansing, Michigan, was the only one in the United States in which students could pursue a college course arranged and adapted to meet the wants of those who might desire, in after years, to engage in agriculture. Since that time, some thirty have been organized. * * * Among agricultural colleges, I am of the opinion that our sister State of Kansas is entitled to pre-eminence in the determination to do the specific work which its name would indicate. It has not impoverished itself by spending its endowment in imposing buildings, but has built only what is needed in a plain and substantial manner. I

commend this example most heartily to our own board of managers. There is a great case being tried in these latter years before the American people, viz: Mind vs. brick and mortar, as an educating power. How many institutions of learning have been shipwrecked because the founders built a magnificent edifice and then were too poor to employ a first-class mind?

EDUCATED BY MIND.—We are educated—and I care not whether the education be classical or technical—we are educated by mind, and not by brick and mortar. I had rather a child of mine would sit down before a warm-hearted, great-minded man, with nothing but the canvas of a tent between them and the winds of heaven, than to enter a fully appointed university, if the great mind be wanting. Of such men as Thomas Arnold and Mark Hopkins, of such women as Mary Lyon and Emma Willard, it may well be said, "To know them is a liberal education." It is impossible, especially for youth, to come within the influence of such a mind without being educated, without being drawn out of self and lifted up by the strong attraction of the master spirit, and made better for time and eternity.

Gentlemen of the Board, I charge you, fling away ambition—if you have any—to erect here grand buildings; but let your ambition rather be to create here an educational influence that shall be felt on every farm, in every kitchen, in every workshop, in every cattle camp in the State of Colorado. We will send you our boys and girls, that you may make of them more skillful men and women than are their fathers and mothers. * * *

NO MODERN DEVICES.—At that time there were no electric lights, no telephones, no gas engines, phonographs, automobiles, concrete pavements, aeroplanes, rural mail routes, nor had the radio been invented. There was no city water system in Fort Collins, but the Poudre River was a pretentious stream those days and flowed not far away. Water was delivered to householders at 50 cents a barrel. There was a well just north of the main building and water was drawn by buckets. It was really not fit to drink. The bell tower not being considered safe, the bell was placed on an improvised tower, about thirty feet north of the front steps of the main building. The rope swung in the breezes and, of course, was a constant temptation at all hours of the day and night.

COLLEGE OPENED SEPTEMBER 1, 1879.—College opened on September 1, 1879, with a total registration of nineteen for the first term. The first faculty consisted of Elmer E. Edwards, president; A. E. Blount, professor of agriculture, and Frank J. Annis, professor of chemistry.

Official action on these appointments was not taken until the annual meeting of the State Board of Agriculture November 28, 1879, at which time Blount's title was fixed as "Professor of Practical Agriculture" and the duties of superintendent of mechanical department were added. His salary was fixed at \$1,200 a year. Annis was given the duties of superintendent of horticulture and nursery department in addition to being professor of chemistry, and his salary was fixed at \$1,000. The minutes of that meeting do not give the salary of President E. E. Edwards.

There was but one course of study, and this was scarcely of college grade. The college year was made to begin with the spring term and close with the autumn term, the long vacation occurring in midwinter. Male

students were required to work on the college farm, for which they were paid at the rate of fifteen cents per hour. Elective studies were first offered in 1886-7. The year following, differential courses were offered at the end of the sophomore year, the choice being agriculture and mechanics. A "ladies' course" was offered in the college year 1889-90.

LITERARY SOCIETIES ORGANIZED.—The first literary society was organized in November, 1879, and was called the Philolethian; this was soon changed to Philomathian. The girls became piqued and formed a society of their own, which they called Aesthesian. Later (1883), the wrath of the girls having been appeased, the two combined into the Philo-Aesthesian. The first number of the Collegian appeared in 1890. In 1880 the buildings on the campus consisted of the east end of what is now known as the main building, the little brick in the northeast corner of the campus and several sheds just west of the railroad track. The following year the dormitory was erected, but was later turned over to the physics department for offices and classrooms. In January of this year (1881) Mr. William Rist, a graduate of Bethany College, was employed to teach mathematics, but remained with the college for only a short time. In February, 1881, Mr. Chas. F. Davis, a graduate of the Michigan Agricultural College, was elected to the chair of chemistry.

A few names stand out conspicuous for achievements. Among those especially notable are: W. F. Watrous and Harris Stratton, the first president and secretary of the board, respectively; John J. Ryan, P. M. Hinman and B. S. LaGrange, members of the first board, who were untiring in their efforts to get the new enterprise under way and were confronted with almost unsurmountable obstacles. On the educational side too much credit cannot be given to President C. L. Ingersoll, Chas. F. Davis and J. W. Lawrence. The latter, a graduate of Massachusetts Institute of Technology, came to the college in 1882. On the administrative side no one did more in wisely directing affairs of the college in early days than Frank J. Annis.

The inventory of all college property at the end of the first year showed a total of \$16,000. The chemical laboratory was built during the winter of 1893-4. The old bell had been moved to the belfry. In those days the bell was a good one and could be heard for many miles in the country.

The first greenhouse and the first wing of the mechnic shop were constructed in 1883. The first addition to the east end of the main building followed in 1889-90. The third addition to the west came in 1901.

ATHLETICS GOT A BAD START.—Organized athletics got a bad start, which may in a measure account for the poor showing made in early-day contests. President Alston Ellis was unalterably opposed to football. In his annual report for December, 1894, appears the following statement:

"Owing to the craze for college athletics, so-called, that has possession of the students of many of our colleges and universities at this time, a brief notice of the subject may not be out of place in my report. Among the catch phrases that have become popular in educational circles, 'Send the whole boy to school,' it is a somewhat pretentious claim made for football when it is asserted that the game develops a high type of manhood in those who engage in it. It would seem that a new definition of manhood is called for. I have no hesitation whatever in placing myself among those



Agronomy Building, Colorado Agricultural College.

who look with disfavor, not unmingled with disgust, upon the game as it is now played. Its tendency is to develop brutality instead of manliness. I am strongly antagonistic to any so-called sport that smacks of professionalism and by its senseless brutality consigns many of its votaries to the invalid's chair. A lively war skirmish is but little more dangerous to life and limb than the game of football. Educators have had difficulty in getting the whole boy to school. A new and perplexing question now confronts them—how are they to get the whole boy back to his home after his school days are over?*"

McCLELLAND'S VIVID RECOLLECTIONS.—One of the first students has written for this history a vivid account of his experiences as a pioneer

*That was written when football was a notoriously brutal sport and President Ellis was voicing a conviction common among educators that playing rules would have to be altered if the sport should continue in the colleges.

"Aggie." He is Frank A. McClelland, long engaged in editorial work on *The Rocky Mountain News*, Denver, son of J. S. McClelland, a pioneer editor and orchardist of Larimer County. This is his story:

My first view of the college grounds was in 1873, in the fall of that year. I was a boy of 12 years, and, in company with my father, the late J. S. McClelland, walked from Mountain Avenue in Fort Collins to Fossil Creek, which is five miles south. My father had taken up what is now the large fruit farm, on land lying between Mail and Fossil Creeks, and we went out to look it over, so that he might plan for the beginning of work the next spring.

As we passed the grounds where the college buildings have since been erected, he called my attention to the spot, saying that there was where I was expected to complete my education. As I was really interested in study and finding out things that announcement carried more to me than it would to the boy who looks on the school house as a prison, and considers it his duty to keep up a feud with the teacher. But the prospect was not bright, even to my young eyes, for the small hills and the swale that ran through the center of the grounds gave no promise of school house or school books.

SHOT DUCKS ON CAMPUS.—The next spring my father took me on a hunting expedition down to the Cache la Poudre—it was one of those small trips of a few hours when a man goes out to shoot ducks and takes a boy along to carry whatever may be killed. My father owned a musket he had brought home from the Civil War. He was a good shot, too, so when he fired it was my duty to run over and pick up what had been shot at. Going up through what is now the college grounds, he spied two ducks in a small pool or puddle in the little creek that trickled its way through the grounds. He fired and the duck took to the air, but it came down in the grass over on the small hill rim, near where the machine shop is now built. Another winter I set figure-four traps for rabbits in the region in and around the college grounds, and caught a good many. I kept it up until some one stole my traps.

BUFFALO SHOT ON COLLEGE GROUNDS.—In the spring of 1878, word was passed down into Fort Collins that a buffalo had been shot on the college grounds. Almost the entire population, and I was not one of the exceptions, went to the scene. There we saw a butcher named William Schenck, busily skinning a young buffalo cow and heard him describe how he had seen the animal browsing with a lot of cattle, had got out his gun and run it down and killed it. He even then was informed that it was a pet of the owner of the cattle—Charles Baldwin of Boulder—that the owner had been sent for and that there would be verbal calisthenics when he should arrive. The buffalo lay on the ground at a spot that is close to where the road now is located running from the college to the railway track and the little station kept there.

In the spring of 1879, work began on putting up college buildings, the first being what is now the front portion of the main building. The building of the college was a matter of great concern to all of us young folk of that day, and I have dim remembrances of visiting the scene of operations many times while the work was under way. College had been underway for sometime before my brother and I were able to join the classes. Some day in October, 1879, we began to attend lectures. With this beginning of attendance on lectures came the two hours of work each day on the college farm. It may seem strange, but it is so, that the labor on the farm is remembered long after every recollection of classroom work has passed. The work was connected with putting the grounds in order—building fences, terracing the grounds in the front yard of the building, repairing crossings of the railway track, manuring the ground, transplanting shrubs, resodding parts of the grounds—so many little bits of work that we were never or seldom ever two days in succession on the one job. How well the work was done is not a matter of record—perhaps fortunately so.

BOARD MEMBERS "SCRAPPED."—The State Board of Agriculture, which had and has the college under its charge, held occasional meetings during those early days, and the members of that board, in the main, practical farmers, would look over the grounds and lay plans for improvements. I remember that W. F. Watrous, Harris Stratton, B. S. LaGrange of Greeley and J. S. Stanger of Denver, all men with whom I was acquainted previous to their being named on the board, were among the members. One

day LaGrange and Stanger spent part of the morning looking over the grounds and planning. A sort of reminder of what they did during that morning may be gathered from a passage at words heard by one of the classes. "Stanger," said LaGrange, with some heat, "you contradict every damn assertion I make." "I don't contradict every damn assertion you make," retorted Stanger, thereby keeping his record clear for the day.

BLOUNT STARTS EXPERIMENTING.—Professor Blount started experimenting in the spring of 1879 with forty-six varieties of wheat, ten of oats, several of corn, among the last Blount's Prolific, a production of his own which promised well but finally proved too late to succeed in this region. Further mention of this is made in the chapter devoted to the State Experiment Station. The harvesting of the first year's crops gave the students their first manual labor.

The first term was called the initial term, twenty-five students being enrolled. Students were required to pass examinations in reading, writing, spelling, arithmetic, geography and grammar. The freshman class was organized in February, 1880, when a regular curriculum was prepared, with a course leading to the degree of bachelor of science.

TEN NIGHTS IN A BAR-ROOM.—Organization of the college Lyceum, later called the Philosophian Society, has already been mentioned. There were open sessions occasionally, to which the public was invited. Prizes were given by citizens for the best essays and debates. In the winter of 1881 the students presented "Ten Nights in a Bar-Room" to a large audience in the old Fort Collins Opera House. Several other entertainments were given, the proceeds being used to purchase a reed organ for the chapel.

During the first two years chapel exercises were held Sunday afternoons, the sessions being open to the public. Faculty members and an occasional outside lecturer led the exercises.

Farmers' institutes were inaugurated at the college in 1879, the first being held in the chapel November 26 and 27 of that year. The program included a paper by Dr. Edwards on "The Relation of the Agricultural College to the People of the State"; by Professor Annis on "Soils and Their Analysis"; John Sheldon on "A New and Promising Plant Called Alfalfa."

Under Professor Blount's direction exhibits were made at the state and county fairs, the work of the college coming rapidly into public favor through these exhibits.

In June, 1879, State Engineer E. C. Nettleton tendered the college the use of meteorological instruments, with the understanding that weather records be kept and a report be made each month to the Weather Bureau at Washington. The instruments were installed and records have been kept ever since. For thirty-five years this work has been in charge of Robert E. Trimble, meteorologist.

It was not until the late '80s that money could be obtained to systematically lay out the farm, establish driveways and set out trees, which have since added so much to the beauty of the campus. Trees near Old Main, however, had been set out earlier.

CURRICULUM KEEPS PACE WITH THE INDUSTRY

The foregoing must suffice for the earlier years of affairs on the campus, that marked the beginning of the State Agricultural College in its primary work of educating the youth. Readers who have followed the thread of agricultural development through the various chapters of this volume have become familiar with the widespread influence of the College in its activities outside the classroom. This was brought out first of all in the chapter on irrigation, the first subject to claim attention when tests with crops began some years prior to the official establishment of the Colorado State Experiment Station. Following that is the chapter on dry land farming, in which it is shown that all efforts toward establishing soil-culture practices and methods, and safe plans of crop and livestock production, finally were co-ordinated through College and Department of Agriculture influence. Next in the order of chapters is sugar beet production, which started years before there was any scientific agency in existence to aid the farmers, but which received immediate attention after establishment of the State Experiment Station.

So the record goes—alfalfa, corn, wheat, potatoes, dairy development, melon growing, orchard fruits, vegetables—all benefiting by the aid which was set up through the land-grant college and the experiment station acts, passed by the federal government and met usually on a dollar-for-dollar basis—or better—by the State of Colorado. What is true of crops applies with equal force to livestock improvement, through breeding, disease prevention, range improvement and feeding; and it applies also in the economics of agriculture, as is apparent from reading the chapter on farm organizations and marketing. In short, no line of agricultural development remained untouched by the College and the State Experiment Station. What that aid has accomplished must be left to the reader to judge, as he studies each separate activity from the beginning to the present day.

It is apropos here to mention these facts, because of the bearing all this had on the College in its classroom work. It may be said in truth, and without semblance of boasting, that no state educational institution has been so entirely subject to the influences of the industry which it was created to serve as has the Agricultural College. On the other hand, no state educational institution has so strongly influenced its industry. Continuity of purpose is manifest throughout the history of the institution,

which has been fortunate in having few changes in administrative heads and few in policy. Whatever changes came in policy were not due to new personnel so much as to conditions in agriculture that dictated advancement.

The State Board of Agriculture has always been the governing body or board of control, and its personnel, from the beginning, has been subject to gubernatorial appointment. Changes in the method of appointment have been made to safeguard continuity of policy, so that in no biennial period are there more than two places to be filled through expiration of term. Always the governor has been *ex-officio* a member of the board, and few governors have failed to take advantage of this opportunity to serve the industry by giving some personal attention to college affairs. From time to time the board has been given added duties and responsibilities.

STATE BOARD OF AGRICULTURE.—Its legal name is The State Board of Agriculture. It consists of eight members, besides the governor and the president of the College, who serve by virtue of office. The statutes provide that the governor, "by and with consent of the Senate, on or before the third Wednesday of January of each biennial session of the General Assembly, shall appoint two members of the board to fill the vacancies that shall next occur, which vacancies shall be so filled that at least one-half of the appointed members of the board shall be practical farmers."

The law specifies that the board shall meet at the State Agricultural College on the Wednesday preceding commencement day in June, and, annually, on the second Wednesday in December. Meetings may be held at other times and places at the call of the president of the board.

The board chooses a president from its own membership biennially, and appoints a secretary, outside its membership. Presidents of the State Board of Agriculture and period of service of each are listed as follows: W. F. Watrous, 1877-1881; B. S. LaGrange, 1881-1884; David Boyd, 1884-1886; George W. Wyman, 1886-1893; A. L. Emigh, 1893-1894; John J. Ryan, 1894-1896; A. L. Kellogg, 1897-1899; Pliny F. Sharp, 1899-1907; B. F. Rockafellow, 1907-1909; Alfred A. Edwards, 1909 to date.

Mr. Edwards has served continuously for seventeen years, having been honored with re-election by his fellow members ever since he first took the presidency, in succession to Captain B. F. Rockafellow. Up to May, 1924, Elias M. Ammons shared with Mr. Edwards the honor of long and faithful service, he too having been appointed in 1909. He served continuously on the board from that year to the time of his death in 1924, including his two years as governor of the state, when he was *ex-officio* a member of the board. Another whose appointment also dates back to 1909 is Judge John C. Bell.

Lathrop M. Taylor, appointed secretary April 14, 1909, to succeed A. M. Hawley, is still serving in that capacity. The act creating the office

of secretary specifies many duties which, in effect, would make the office correspond to that of a state commissioner of agriculture. In the early years the secretary was able to carry out some of these duties, such as seed distribution, supervision of institute work and the like. As the institution expanded, the secretarial, accounting and administrative duties became so manifold that educational effort was relinquished by the secretary to other agencies of the College.

The president of the Board of Agriculture and two members, selected at biennial intervals by the board, constitute an executive committee which meets once a month, to pass upon every detail of college management, including bills and accounts, as well as proposed changes in personnel through resignation or other causes. This committee carries out literally for the board the following provision of the statute entitled "An Act to Establish a State Board of Agriculture and Define Its Duties," as follows: "Sec. 7.—The board shall direct the disposition of any moneys appropriated to the State Agricultural College."

ONLY FIVE PRESIDENTS.—While the governing board thus is shown to have been remarkably free in the last seventeen years from changes that so often handicap a politically appointive body, the history of the institution also shows stability in its chief administrative heads. The College has had only five presidents in forty-seven years. E. E. Edwards was the first, serving from 1879 to 1882, about three years; C. L. Ingersoll, to 1891, nine years; Alston Ellis, to 1899, eight years; Barton O. Aylesworth, to 1909, ten years, and Charles A. Lory, to date, seventeen years. S. Arthur Johnson is dean of the faculty and Virginia H. Corbett serves as dean of women.

To one reviewing the progress of the institution from the outside, the temptation is to write of it by periods of administration. That, however, would necessarily be an arbitrary process. Changes were made, of course, with each incoming administration, but these were mostly incidental. The growth of the College as an educational institution has kept pace steadily with the state's agricultural development. The curriculum reflects that development, clearly and definitely, as indeed must be the case with an institution that has never restricted its activities to the classroom, but, contrariwise has been a constructive force in its industry.

RESIDENT INSTRUCTION.—Resident instruction in the first years was not altogether of college grade. The institution was little more than an academy or seminary, ranking between an elementary school and college. The first courses of study were arranged to suit the demand of prospective students, in accord with the limited facilities and small faculty. These faculty members were not specialists, but men who had broad training as

teachers and who were able thus to fill the places first assigned to them, and to give such individual attention to students as small classes of unequal preparatory training necessitated. Much stress was laid on the practical, and an attempt was made to provide instruction in elementary studies for which, in many cases, the student then enrolling in college, had not found earlier opportunity.

This condition was apparent only in the beginning, for as soon as money became available to increase the facilities for study, purchase laboratory equipment and engage instructors who could qualify as specialists in technical subjects, changes were made in the curriculum and the entrance requirements became more rigid.

Engineering was the first subject to be raised to the standard of college grade along technical lines. Elwood Mead, who had been appointed professor of mathematics and engineering in 1882, was quick to perceive this need. He taught these subjects two years, then left for two years, but returned in 1886 as professor of physics and irrigation. In his annual report to the Board of Agriculture under date of January 1, 1887, he said:

INITIATIVE IN IRRIGATION.—“In establishing the chair of irrigation engineering the College has taken the initiative in what must soon be an important branch of industrial training in all technical schools in the arid region. In Europe every country where irrigation is practised has schools supported and controlled by the state for the education of the irrigation engineer. In the United States, while this College is first to offer college training in the subject of irrigation engineering, two other industrial schools have since made it a prominent feature in their courses of study. In a country, however, where thirty-two million acres of otherwise valueless and unproductive land have been brought under cultivation through the art of irrigation, and where there yet remains two hundred and fifty million acres susceptible of being thus reclaimed, the need of such training and the opportunities for usefulness open to those possessing it, either as farmers, citizens in the ordinary walks of life, or as engineers, are too great to admit of doubt or question.”

The catalogue of 1886-7 lists a department of irrigation engineering for the first time, stating its purpose as follows: “The instruction in this department is designed to acquaint the student with the theoretical and practical features of irrigation as applied to agriculture of the arid region.” The course was continued through the junior year and the winter term of the senior year.

At that time other departments were listed as follows: Agriculture, including the study of breeds and breeding of farm animals, crops and soils, including thrashing and marketing; laying out of farm; irrigation

and its application; dairy husbandry; farm accounts; rotation of crops; drainage; farm implements, and selection and breeding of cereals.

Botany, chemistry, horticulture, mathematics, military science, practical mechanics, physics, physiology and comparative anatomy, zoology, microscopy and veterinary science were taught. Under cultural studies we find English, history and literature, French and German, mental and moral science, logic and political economy.

That was an ambitious curriculum, with an evident emphasis upon two main subjects, agriculture and irrigation. A study of the catalogues shows rapid development of irrigation, but with a growing tendency toward the engineering and construction phases of the subject, rather than the application of water. The latter subject was left largely to the teachers of agriculture.

At this time, also, practical mechanics subjects were becoming popular, this finally crystalizing in the establishment of a mechanical engineering department.

It was natural that men of specialized training, who now came to the faculty, exerted great influence upon the development of the particular subjects which they taught. However, the relative importance to the state of agriculture and engineering was not maintained in the curriculum, engineering soon stepping ahead of other departments and maintaining a lead for many years. There is nothing in this fact to deplore, for the importance of the subject seemed at that time to merit the effort. The only regrettable feature was the fact that other divisions of resident instruction could not be maintained at the same level of efficiency. Agriculture was in partial eclipse for some years, and it finally took an upheaval to restore the balance. That restoration came when the range livestock industry lost its speculative glamour and more attention had to be given to general agriculture and livestock feeding.

It is of interest to note that Elwood Mead, who pioneered in irrigation teaching, and who has since become world-famous in the application of irrigation engineering to land development, was succeeded in 1888 by L. G. Carpenter, another engineer who has attained fame in his profession. Carpenter called the attention of the board to the lack of irrigation literature in the English tongue, bringing out the fact, apparent to the readers of previous pages of this history, that irrigation was new to Anglo-Saxon people. He was given leave of absence to visit France, Spain, Italy and Egypt, for study of irrigation systems, and he brought back to the College much knowledge from these Mediterranean countries, useful in the development of courses of study.

While this reaching out for the experiences of older countries in irrigation was in progress from Colorado, the work being done here was, in

turn, attracting attention in other parts of the world where semi-arid conditions prevail. In 1893 foreign visitors were entertained at the College from Finland, Russia, Turkestan, Holland, England and Germany, all desirous of investigating agriculture under irrigation and learning something about methods of teaching this phase of technical agriculture.

PREJUDICE AGAINST FARM SCIENCE.—Professor E. B. House, now head of the department of civil and irrigation engineering, who has been a member of the faculty since 1896, when he came as an instructor in mathematics, has explained the conditions that existed in reference to agricultural education at that time. During summer vacations it was Prof. House's duty to travel over the state, to interest people in the work of the College. He found little response among rural people to his presentation of agricultural education, for the farmer, when approached as to sending his son to college, would say: "Farming, farming—why bless my soul! if John wants to be a farmer I will teach him all there is to that right here. But John doesn't want to be a farmer, do you, John?"

John's reply invariably was: "Oh, I should say not!"

Professor House would then tell of the engineering opportunities, and many times John would come to college with engineering as his choice of professions. However, in his first two years, he would discover that he had a poor mind for mathematics, and then he would decide to change his course to agriculture.

That illustrates the prejudice which had to be overcome among farming people against scientific training in their own line. It should be mentioned, however, that this was in the days before the development of county agent work or vocational teaching in rural high schools, when the need for trained teachers of agriculture had not materialized and when comparatively few channels were open to the agricultural college graduate. Back-to-the-farm training did not seem to demand a four-year technical course; at least the farmer was inclined to take that practical view, and to consider the question of higher education from the standpoint of the value of the training to the farm and not so much to the man or the woman trained.

AYLESWORTH SUMS IT UP.—President Aylesworth, in his annual report for 1906, touched upon the matter thus: "We have strengthened the course of study by striking off the first preparatory year, by adding a year at the top of each course, and by such other changes in the remainder of the curriculum as will best make excellent working experts and good citizens. We have been searching, in fact, for the best possible agricultural curriculum, keeping always in mind the needs of our state. The land grant colleges have been compelled to slowly find their destiny in the educational world. We think the problem as at last been solved. Their function is

three-fold: experimentation, instruction and dissemination. These are met by the experiment station, the college and the institute or extension workers. More and more the member of each of these three groups must work within his own group."

The problem encountered in Colorado was similar to that of other states in the development of the land grant colleges, though it was intensified in this state by the variety of conditions under which agriculture is carried on here, and by the lack of fundamental teaching material to fit these conditions. This accounts, in part, for the early rush toward irrigation engineering.

The pendulum swung back in time toward a better balanced curriculum, without affecting the strength of engineering. That course, under Professor House's supervision, was changed to provide more irrigation engineering, as distinguished from civil engineering, and in 1912 highway engineering was added, to keep pace with the better roads movement, which is of such vital concern to the movement of crops to market.



Class in meat cutting, Animal Husbandry Department, Colorado Agricultural College.

LIVESTOCK SEEKS RECOGNITION.—As might have been expected, the time came when other lines of agriculture began clamoring for more attention in the course of study. The range livestock industry had experienced a change from the old conditions of free and unlimited grass to a basis

when small herds and better quality were necessary to assure success in beef production. Dairying was becoming an important industry; hog raising had assumed proportions that indicated there was money in the business, and the establishment of the sugar industry made fattening of beef cattle and lambs an attractive avenue for the farmer.

While this development was being aided by research, and more and better livestock was a favorite subject on the platform of farmers' institutes, the curriculum did not recognize animal husbandry as a major subject until 1907-'08. The catalogue covering that year announced that senior students in agriculture would be permitted to major in animal husbandry, and in June, 1908, four students were graduated in that subject. In the following year a separate course in animal husbandry was announced.

This does not mean that animal husbandry had been previously ignored, but it assumed now the status of a major subject in which students enrolling in agriculture might specialize. That this change was timely is evidenced by the popularity of the subject, as from 50 to 70 per cent of the agricultural students now major in animal husbandry. This indicates complete recognition of the fundamental idea on which successful agriculture in Colorado is based.

GOES BACK TO BEGINNING.—The agricultural division, of which the animal husbandry department is an outgrowth, goes back to the very founding of the College. Ainsworth E. Blount was the entire department in 1879—teacher, research worker and institute lecturer. His title was professor of agriculture. Much was expected of him and he gave much. Twenty-five years later the department was separated into two sections, animal husbandry and agronomy, with W. L. Carlyle as dean in charge and Walter H. Olin as professor of agronomy. This arrangement continued from 1904 to 1908. The deanship was abolished in 1908, and Prof. George E. Morton, who had come as professor of animal husbandry in 1907, was made acting head of the new department. His appointment was made permanent in 1909. In 1910 a separate course in agronomy was offered for the first time, with Alvin Kezer in charge as department head. Since then agronomy has been separate from animal husbandry as an administrative unit.

As now constituted, animal husbandry includes meat animal production, horse work, dairy husbandry, dairy manufactures and poultry husbandry. The teaching personnel under Professor Morton comprises Charles I. Bray, Charles N. Shepardson, L. P. McCann and H. H. Smith.

Incidental to its teaching work the animal husbandry department maintains herds of various classes of livestock, including Shorthorn, Hereford and Aberdeen Angus beef cattle; Holstein, Jersey and Guernsey dairy cat-

tle; Duroc-Jersey and Poland-China swine; Hampshire, Rambouillet and Shropshire sheep, and Percheron horses.

The department is closely identified with the state's livestock breeding industry, takes part in the Western National Stock Show; sends student judging teams to this and other livestock expositions; makes exhibits at these shows and has several times won national and international grand championships at such shows, in competition with other agricultural college herds and with the leading breeders' herds of the United States and Canada.

Within this department also is placed the office of State Dairy Commissioner, in which capacity the head of the department serves. This work is more fully mentioned in the section of this volume giving a history of the dairy industry.

AGRONOMY COURSE.—The agronomy course includes crop production, soils, plant breeding, irrigation farming, rural architecture, farm machinery, farm motors, power machinery and related subjects, with Alvin Kezer in charge, others on the teaching staff being J. W. Sjogren and F. B. Smith, associate professors, and C. H. Alford, assistant professor. As head of the agronomy department Professor Kezer is also farm manager of the home plant at Fort Collins, comprising 480 acres of irrigated land and 1,080 acres of foothills pasture.

BOTANY.—Botany is required of all students in the divisions of agriculture, science and veterinary medicine. Historically the department is traced through various changes from the original study of general agriculture under Blount. The next step was botany and horticulture united under James Cassidy in 1883; then botany and forestry combined, with Longyear as professor, in 1910, and full departmental status in 1916, with W. W. Robbins in charge. He was succeeded by A. K. Peitersen, who died in 1924, and whose successor, Dr. L. W. Durrell, is now in charge, with a staff composed of: H. C. Hanson, associate professor; C. D. Learn, assistant professor; E. A. Lungren, Charles F. Rogers, instructors.

ENTOMOLOGY.—Entomology has been taught since 1890 by C. P. Gillette, who has been in charge ever since. In 1910 the subject was first listed as a separate course. At present the teaching staff includes S. Arthur Johnson, Charles R. Jones, associate professors; Miriam A. Palmer, J. L. Hoerner, Mabel A. Hoyt, assistant professors; W. L. Burnett, curator of the museum.

HOME ECONOMICS.—The catalogue of 1880 made mention of hygiene, foodstuffs and household economy in the general course, indicating that provision was made for women students from the very beginning. A separate "ladies' course," as it was called, was established in 1887-8. It included commercial subjects. The first professor of domestic economy was

Theodosia G. Ammons, appointed in 1895. This marked the beginning of women's courses under a separate department head. The department is in charge of Inga M. K. Allison, the staff including Charlotte A. Carpenter



Class in Home Economics at Colorado Agricultural College.

and Bertha A. Most, associate professors; Frances A. Starin, Beryl Dixon and Hulda H. Cooke, assistant professors.

HORTICULTURE.—Horticulture, like other subjects directly related to agriculture, has been taught from the opening of the College, the first instructor being Frank J. Annis, who also taught chemistry and mathematics. P. M. Hinman was the first superintendent of horticultural work, which included gardening on the campus, and Mrs. A. E. Blount was superintendent of floral work. James Cassidy was the first professor of horticulture, combining it with botany in 1883. In 1910, when the two branches were separated, E. R. Bennett became professor of horticulture. He was succeeded by Dr. E. P. Sandsten, at present in charge. R. A. McGinty is associate professor and Edgar Tubby florist.

MECHANICAL ENGINEERING.—The department of mechanical engineering ranks with the oldest divisions of the College, and in its long period of usefulness, devoted strictly to instructional work, with little direct contact with the general public, has trained thousands of young men in the practical lines assigned to it. In 1882 the first professor of mechanics and drawing was appointed, in the person of F. H. Williams. He served only

a short time, and on March 21, 1883, James W. Lawrence succeeded him. Under his supervision the work was developed to departmental status. In 1907 Professor Lawrence became dean of the faculty, but remained also head of mechanical engineering until failing health compelled him to relinquish the work. He was succeeded by Professor LD Crain as active head of the department, Professor Lawrence retaining the status of emeritus professor. The course includes care of tools used in farm shop, filing and setting of saws, sharpening of edged tools, construction of farm buildings, repair of tools and harness, rope work, soldering, forge, foundry, machine shop work, mechanical drawing, machine design, power plant engineering, steam turbines, heating and ventilation, internal combustion engines, compressed air machinery, refrigeration, hydraulic machinery, specifications and contracts; in fact, nearly everything that relates to the broad subject of mechanics as applied to the farm and to industrial plants. The department has a mechanical engineering laboratory equipped with various types of engines and devices of all sorts for the purpose of teaching, in a practical way, the branches assigned to it. Professor Crain's staff includes J. H. Scofield, G. F. Henry and J. Pinsky, associate professors; R. A. Bradley and E. J. Mayer, assistant professors.

ELECTRICAL ENGINEERING.—The course in electrical engineering dates back to 1902, when LD Crain taught the subject. In 1907 Charles A. Lory then professor of physics, became professor of electrical engineering and physics. He was succeeded in 1909 by Prof. F. G. Person, on Lory's appointment to the presidency. In 1919 electrical engineering became a separate department with L. S. Foltz as professor. In 1920 Henry G. Jordan took charge of the department. Carl T. Almquist is associate professor.

VETERINARY DEPARTMENT.—Veterinary science has been taught since the early years, the first instructor in that branch being Dr. George C. Faville, who was appointed in 1883. Numerous changes occurred and for a long period no veterinary instructor was employed. In 1899 Dr. George H. Glover, a member of the first graduating class of the institution, was engaged to come to Fort Collins from Denver for one lecture a week. This arrangement was continued for two years, whereupon Dr. Glover was engaged on full time as instructor in veterinary medicine. Later the work was enlarged and organized on a departmental basis, a complete course in veterinary medicine being established in 1907.

In the course of years the institution has developed one of the strongest and best known schools of veterinary medicine in America. Dr. Glover has remained as head of the department. The work of the division in protection of the livestock industry is explained in detail on the pages

devoted to the State Experiment Station. The teaching staff is composed of: Dr. Harry E. Kingman, Dr. Richard F. Bourne and Dr. James Farquharson. The pathology department was separated from the veterinary department in 1918, Dr. I. E. Newsom being in charge with Drs. William H. Feldman and Floyd Cross as associates. Veterinary pathology, laboratory diagnosis, meat inspection and dairy inspection are among the subjects taught.

FARM ECONOMICS.—The initial courses of instruction in farm economics were developed in the department of English and history and in the department of agronomy. The first course in sociology was offered by Dr. W. R. Thomas during the college year 1911-12. The work at that time was general and little emphasis was given to the problems of country life. Later, this course was changed to rural sociology and country-life problems were given prominence in the discussions. Similar development may be noted in the evolution of courses in farm management and marketing. Growing interest in economic problems led to the enactment of special legislation in 1921.

Acting under authority of House Bill No. 527, the department of economics and sociology was established in November, 1921. The preliminary steps in the organization of the department were taken during the early part of November, 1921, and Llewellyn A. Moorhouse was appointed head. Courses of instruction were outlined in economics, farm organization and management, advanced farm organization and management, marketing and co-operation, advanced marketing, cost accounting, agricultural economics, rural sociology, advanced rural sociology. Instructional work with College, School of Agriculture and vocational classes was begun at the beginning of the second semester of the college year 1921-22.

The teaching staff is composed of Llewellyn A. Moorhouse, professor, and B. F. Coen and R. T. Burdick, associates; Carl Gentry, assistant professor.

FORESTRY.—In August, 1904, B. O. Longyear became instructor in botany and horticulture under Professor Wendell Paddock. The subjects he taught included elements of forestry. During the following year a small experimental plantation of trees was started on the college farm. This plantation is still maintained, having been enlarged from time to time and now including over 100 native and foreign species of trees.

During the winters of 1906 and 1907 short courses in forestry for rangers in the National Forest Service were held at the College. There were the first ranger courses ever given in the United States.

In June, 1908, on the resignation of Professor Paddock as head of this department, botany and forestry were separated from horticulture, and

Professor Longyear was appointed head of botany and forestry. During the following year forestry was first offered as a four-year course.

The next important event in the history of the department was the passage of a law by the General Assembly, creating the office of state forester, to be filled by the professor of forestry at the Agricultural College. Professor Longyear thus became the first state forester, beginning his work in that capacity in January, 1912.

Congress in that year passed a special act, enabling the Agricultural College to purchase 1,600 acres of forested land within national forest boundaries. This area was selected in Pingree Park, about forty-five miles



Future flockmasters learning to grade wool at Colorado Agricultural College.

west of Fort Collins. During the autumn of 1914 a forestry lodge was built, accommodating forty students. Summer work in forestry is carried on at the lodge.

Professor W. J. Morrill, who had been head of the forestry department at the University of Nebraska, was appointed professor of forestry and state forester and Professor Longyear assumed the duties of associate professor and deputy state forester. The teaching staff comprises W. J. Morrill, professor; Burton O. Longyear, associate professor, and R. E. Ford, instructor.

MILITARY DEPARTMENT.—The federal law creating the agricultural colleges, known as the Morrill Act, of July 2, 1862, included in the purposes of such colleges the teaching of military science. The language of the statute specified that this teaching “without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts.” Under this act all colleges receiving benefit therefrom must give military science and tactics a prominent place in the course of instruction. In 1881 a company of cadets was organized at Colorado Agricultural College, with a roster of thirty-six. They were armed with Spencer carbines and instructed by the president of the College. In 1884 the department was taken over by Major V. E. Stolbrand, an ex-officer of the 13th U. S. Infantry, after which regular drills were required. Several changes occurred in command, and there was continual progress. In 1899 Major R. A. Maxfield, a graduate of C. A. C., was appointed commandant of the battalion. Maxfield had served as an officer of the U. S. Engineers in the Spanish-American War. Under Major Maxfield the spring training camp was inaugurated, the site being in the foothills northwest of town and known as Camp Aylesworth. This camp was discontinued in 1903. Major Maxfield continued in command until February, 1906, when he was relieved by Capt. T. M. Anderson, Jr., of the 7th U. S. Infantry. The following year Captain Humphrey, then on the retired list, was appointed commandant, which position he held until his death in 1912. His successor was Major G. L. Scott, 6th U. S. Cavalry, retired, who remained until 1915, when he was relieved by Lieutenant J. A. Rogers, 20th U. S. Infantry.

When an Officers' Training Corps was established, Lieutenant Rogers formed a class of candidates for that corps. Thirty-three students enrolled in the fall of 1916 and all were commissioned during the following spring. These men ranked from second lieutenants to captains and formed the nucleus of students going from this institution to the first officers' training camps, held in the summer of 1917. Lieutenant Rogers was also instrumental in the establishment of Battery A, 1st Colorado Field Artillery, and its first commanding officer.

When war was declared in April, 1917, Captain Rogers was ordered to active duty, being assigned to the 6th U. S. Field Artillery, with which he served throughout the war, with promotions through several grades to the rank of colonel. The creditable showing made by the students of C. A. C. in the training camps of 1917 and as officers during the war was attributed largely to the excellence of the training given by Colonel Rogers.

Lieutenant T. J. J. Cristian, 9th U. S. Cavalry, was assigned to the institution for a few months during the summer of 1917, and in the fall of that year Captain L. R. Ball, a retired officer, succeeded him, remaining

until the formation of the R. O. T. C. in 1919, in command of Major William C. Harrison. In 1922 the last named was succeeded by Major G. H. Franke, who remained until the summer of 1924. On September 5, 1924, Major John P. Lucas succeeded to the command. He is professor of military science and tactics, and the staff includes Captain Ward H. Maris, Captain Loyal M. Haynes, Captain J. W. MacKelvie, First Lieutenant Lloyd R. Garrison, First Sergeant Roy O'Kane and Sergeant Frank M. Lydon.

RURAL AND VOCATIONAL EDUCATION.—Training of teachers of agriculture, home economics, trade and industry, under the Smith-Hughes law, is the function of the department of rural and vocational education. The courses for students intending to qualify as teachers include: psychology, sociology, principles of education, and methods. These courses are providing the training for the many teachers required in Smith-Hughes high schools and other vocational institutions, graduates being placed not only in Colorado but in many other states of the West. This demand for teachers specially trained along vocational lines has arisen in the last ten years. It is co-ordinate with the establishment of Smith-Hughes work, and, in Colorado, has developed rapidly as a result of the rural school improvement program of the Agricultural College, the details of which are given elsewhere in this volume.

The department has the following resident staff: C. G. Sargent, professor of rural education; George T. Avery, associate professor, education and psychology; G. A. Schmidt, associate professor of agricultural education and teacher training; Margaret E. Durward, associate, education, and those listed under the Smith-Hughes staff mentioned elsewhere: L. R. Davies, R. W. Foard, Mary Blodgett, Maude Williamson and H. A. Tiemann.

Scientific and cultural branches taught by departments not so directly in contact with the state's agriculture as the foregoing, but equally essential in the training of young people for professional or practical service in agriculture and the mechanic arts, include chemistry, physics, mathematics, English and history, physical education, languages and music. Only the present organization of the College faculty along these lines can be given here, without attempt to trace these departments through the various changes from the original organization of the College, when each one of the small faculty was a general-utility teacher and not a specialist, as is required today.

CHEMISTRY: G. H. Whiteford, professor; Roy G. Coffin and Elizabeth M. Wing, associate professors; W. E. Pyke, Norman J. Harrar, C. G. H. Johnson, Keith G. Irwin and Ruth Fehleisen, instructors.

MATHEMATICS: S. L. Macdonald, professor; Andrew G. Clark, assistant professor; Mrs. Nellie Landblom, Dwight F. Gunder and E. T. Sheppard, instructors.

ENGLISH AND HISTORY: Alfred Westfall, professor; Virginia H. Corbett, C. F. Davis, Lucile D. Smith, associate professors; Ruth J. Wattles, Alice B. Curtis and Alinda E. Montgomery, assistant professors; Sarah L. Schmidt and Paul R. Brown, instructors.

LANGUAGES: Sarah I. Kettle, professor; Elsie E. Pell, assistant professor; Ruth E. Edwards and Mrs. R. G. Richmond, instructors.

PHYSICS: Fred G. Person, professor; Frank P. Goeder, associate professor; Dorsey F. Richardson, assistant professor; Orve K. Hedden, instructor.

PHYSICAL EDUCATION: H. W. Hughes, director; R. H. Lavik, associate professor; Elizabeth Forbes, William Saunders, G. W. Tompkin and George Anderson, assistant professors; Marion Fezer and Naomi Russell, instructors.

MUSIC*: Alexander Emslie, director of Conservatory; Clarence D. James, Mrs. Alexander Emslie, Mrs. Clarence D. James, W. H. Feldman and D. C. Carson, instructors.

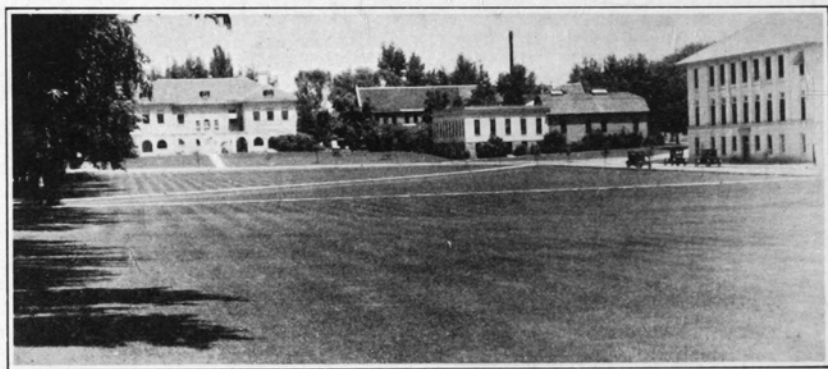
SUMMER SESSION.—The College maintains a strong graduate school and also has a summer session, which has been developed in recent years, drawing as students many who are engaged in the teaching profession. The summer session faculty includes many noted educators. Exceptional advantages for summer study are due to favorable climatic conditions and nearness to the mountains, in which the Agricultural College shares popularity with other Colorado educational institutions. Dr. George T. Avery is director of the summer session.

COLLEGE LIBRARY.—There is a tradition that very early in the history of the College the first president, E. E. Edwards, walked into his office with a Webster's dictionary under his arm. Placing it on a table, he remarked, "Now we have started our library." From this modest beginning has come the library of today with 54,657 volumes and about 25,000 pamphlets.

In the summer of 1906 Miss Charlotte E. Baker, who had been five years in the cataloguing department of the Denver Public Library and six years librarian of the New Mexico Agricultural College, was appointed as assistant to the librarian, Joseph F. Daniels. She succeeded Mr. Daniels January 1, 1910, on his resignation and removal to California. In 1926 plans had been completed for a new library building.

*The Conservatory of Music is self-sustaining. Its courses are elective and its work is co-ordinated with that of the College.

THE LORY ADMINISTRATION.—The seventeen years of the Lory administration have been coincident with the state's greatest agricultural and industrial expansion; the years of prosperity that preceded and ushered in the war and the years of discouraging aftermath, from which the agricultural industry is just now recovering. Agricultural education has made wonderful strides during this period and Colorado has been hard pressed to keep apace. The state government has always been moderately poor; at



View of the Oval, with Physics Building at right and Guggenheim Hall (Home Economics Building) at left.

times financially embarrassed; never flush. Its physical properties, including the capitol at Denver and the buildings devoted to educational uses in various centers of learning, are modest testimonials to a policy of thrift.

Whether by choice or force of circumstances hardly matters, but the fact is that the same policy of thrift has prevailed in the administration of the Agricultural College. "Pay as you go" has been the motto of successive Boards of Agriculture, carried out to the letter by the present administration. A ten-year building program has just run its course as these lines are written. Each year has witnessed some modest structure, urgently needed, added to the group on the campus at Fort Collins. These buildings are unpretentious in size, but substantial and architecturally balanced. And, they are paid for. Future generations are not to be taxed for their cost, and there are no interest charges on deferred payments, nor sums to go into sinking funds, to be met out of taxes uncollected.

Looking at the physical assets comprising this group of twenty-five buildings, and at the rich land surrounding these structures, and then passing in thought from these outward evidences of an educational plant to the spiritual values engendered through the combined efforts of administrators, instructors and research workers over a period of forty-seven years,

in enhancing the productive capacity of farms and ranches, and in teaching thousands of young men and women how to live useful and satisfying lives, and the job then does seem worth while. The historian, who has approached the subject with an outside viewpoint, makes no apology for urging the people of the state to continue their liberal support of higher education. It pays.

GROWTH OF EXTENSION SERVICE

INSTITUTES AUTHORIZED IN 1879.—Farmers' institutes were authorized at the first annual meeting of the State Board of Agriculture, November 28, 1879. Extension work began, therefore, with the opening of Colorado Agricultural College in the fall of that year. The action of the board, as shown by the minutes, was as follows: "On motion of P. M. Hinman, all communications in reference to holding farmers' institutes were referred to the secretary, with instructions to inform all applicants that the faculty and the State Board of Agriculture, in part or whole, will attend the institutes, provided satisfactory arrangements with the railroad officials can be made for transportation."

Free transportation was given by the railroads for educational work at that time, and had it not been for that liberality very little lecture work could have been done away from the campus.

The action of the board would indicate that demands for institute lectures had come from farmer groups. While most of the institute work was done in northern Colorado, there came a call that first winter of 1879-80 from Del Norte. According to the recollection of Dr. George H. Glover, a student in the first class, this call was answered by Blount and Annis, who went by rail to Alamosa, then the terminus of the Denver & Rio Grande's southwestern line, and from Alamosa by wagon to Del Norte. That town was a lively outfitting point for miners of the San Juan country. The settlers along the upper Rio Grande were finding a ready market for the food they produced. Wheat and potatoes were the principal crops, though there was also some dairying.

THE LONGMONT INSTITUTE.—Other farmers' institutes were held that winter. These gatherings were forerunners of what is now called agricultural extension work. At that time the meetings were devoted to discussions of experiences in farming and exchange of ideas in which a few were selected as program leaders. While the general plan was the same as that followed by the earlier farmers' clubs, described in detail in another chapter, the institutes differed somewhat from the farmers' clubs in confining themselves more exclusively to farm problems and letting political questions alone. However, the distinction was not always adhered to. At

Greeley, the Weld County Farmers' Institute of the present is the successor to the old farmers' club and it is hard to make a distinction, except in type of program and in name.

Mrs. Nellie A. Goss, in writing about the Longmont farmers' institutes for The Times of that city, under date of February 14, 1914, gave the following historical information:

I have not been able to learn positively that there were regular meetings in Longmont prior to 1880. I do know, however, that there was a farmers' institute held in Longmont in the winter of '79 and '80. It was held in the Congregational Church, and to the best of the recollection of my informant, Dr. Sewell, then president of the State University, if I am not mistaken, and Professor Blount,* president of the State Agricultural College, and Professor Annis of the college, were present and the latter delivered an address on 'The Chemistry of the Soil.'

The earliest complete farmers' institute program in possession of Mrs. Goss is that of the session of February, 1883, at the Dickens Opera House, including the following lectures:

Thursday, February 22: "Irrigation", Daniel Tracy; "Bee Culture," J. S. Flory; "Carp Culture," S. Terry; "Fruit Culture," G. W. Webster; "The Dairying Interest," J. W. Bacon; "Broom Corn Culture," R. B. Glover.

Friday: "Reclaiming Alkali Lands," Fred Affolter; "Restoring and Maintaining Fertility of Soil," Dr. I. L. Bond; "Farmers' Orchards," D. S. Grimes; "Some of the Relations of Chemistry to Agriculture," G. W. Rust.

Saturday: "Potato Culture," C. Carlton Calkins; "Wheat Culture," Professor Blount; "The Horse," R. L. Culver; "Construction of Silos and

*A. E. Blount was Professor of Agriculture and not President of the College; Frank J. Annis was Professor of Chemistry.

PROGRAM
OF THE
FARMERS' INSTITUTE,
TO BE HELD AT THE DICKENS OPERA HOUSE,
Longmont, Colorado,
February 22d, 23d and 24th, 1883.

THURSDAY, FEBRUARY 22d, 10 O'CLOCK, A. M.

"Irrigation,"	Daniel Tracy
"Bee Culture,"	J. S. Flory
"Carp Culture,"	S. Terry

2 O'CLOCK P. M.

"Fruit Culture,"	G. W. Webster
"The Dairying Interest,"	J. W. Bacon
"Broom Corn Culture,"	R. B. Glover

FRIDAY, FEBRUARY 23d, 10 O'CLOCK A. M.

"Reclaiming Alkali Land,"	Fred Affolter
"Restoring and Maintaining the Fertility of the Soil,"	Dr. I. L. Bond

2 O'CLOCK P. M.

"Farmers' Orchards,"	D. S. Grimes
"Some of the Relations of Chemistry to Agriculture,"	G. W. Rust

SATURDAY, FEBRUARY 24th, 10 O'CLOCK A. M.

"Potato Culture,"	C. Carlton Calkins
"Wheat Culture,"	Prof. Blount
"The Horse,"	R. L. Culver

2 O'CLOCK P. M.

"Construction of Silos and Storage of Ensilage,"	G. W. Rust
"Farmers' Mutual Hail Insurance Companies,"	Luther H. Kauffman

LITTLE FIGURE.

After each address, opportunity will be given for discussion, and every farmer is earnestly invited to be present through the entire institute, and in order that all the good points may be got out of the different subjects, let each one prepare a list of questions on those papers read, other subjects than those above mentioned, will be introduced if it shall be the desire of a majority present.

Longmont Institute Program of 1883.

Storage of Ensilage," G. W. Rust; "Farmers' Mutual Hail Insurance Companies," Luther R. Kaufmann.

A glance at the subjects indicates that problems forty years ago differed very little from those which might be discussed at a farmers' meeting today.

Mrs. Goss has preserved the programs of these institutes up to very recent years, the Longmont institute being by many years the oldest in Colorado in continuous service to the community. Names appearing on subsequent early programs that are familiar to the farmers of northern Colorado include J. S. McClelland, founder of The Fort Collins Express and pioneer Larimer County fruit grower; A. E. Gipson, then of Greeley, who in later years was editor of The Idaho Farmer; J. E. Washburn of Loveland, secretary of the Northern Colorado Horticultural Society; Dr. Alexander Shaw, for years prominent in the State Horticultural Society; and, always, the professors of the Agricultural College, including President Alston Ellis, L. G. Carpenter, C. P. Gillette, Professor Cooke and Professor O'Brine.

In 1895 the Longmont Farmers' Institute was organized on a permanent basis, with J. W. Bacon as president; G. D. Rider, vice-president, and Dr. George H. Glover, then a resident of Longmont, as secretary.

LOVELAND AND COLLINS.—Loveland started a farmers' institute shortly after that of Longmont, the first record being of a meeting in the Grange hall in 1881, at which B. S. LaGrange of Greeley and Thomas Johnson of Loveland were the principal speakers. Sessions were held in subsequent years at which Agricultural College professors and leading farmers from the Union Colony at Greeley were on the program.

Fort Collins held a farmers' institute in 1888 and also in the years following. At the '88 session the college speakers included J. W. Lawrence, Frank J. Annis and A. E. Blount, and among the farmers on the program were John G. Coy, who spoke on stock feeding. Coy was one of the earliest farmers to finish beef for market. R. Q. Tenney discussed "The Best Horses for Farm and Market," A. F. Howes spoke on "Shorthorns" and Dr. Glover came up from Longmont, where he was practicing as a veterinarian, and gave a talk on animal diseases.

At the Golden farmers' institute February 2, 3 and 4, 1888, twenty-seven papers and addresses were given, among the speakers being President Ingersoll of the Agricultural College on "How Shall We Educate?" Dr. George H. Glover of Longmont on "Contagious Diseases and Stock Raising," Prof. Blount on "Improvement of Seeds," Elwood Mead on "Drainage and Seepage," J. S. Stanger on "Corn Raising," "Judge" Downing on "Grasses." Downing was the man who introduced alfalfa in 1863 and

who in 1888 was the largest grower of that crop in Colorado, his farm being in Jefferson County.

BULLETIN ON INSTITUTES.—In 1893 there was issued by the college a "Farmers' Institute Bulletin," containing a definition of the meaning of that term, complete suggestions for programs and a list of college speakers available for lectures. D. W. Working, then secretary of the State Board of Agriculture, prepared this pamphlet. He was one of the lecturers, the others being President Alston Ellis, L. G. Carpenter, C. S. Crandall, C. P. Gillette and W. W. Cooke. Each individual had a series of four lectures, from which the farmers might choose a suitable subject. The institute force was also the experiment station council, and the pamphlet pointed out that "these men have immediate control of the work of scientific investigation," and that their training and work "specially fit them for usefulness in making institutes helpful and interesting."

While institute work continued to be a definite duty laid upon the instructors and station workers for many years, it was not organized upon a departmental basis until 1907, with the appointment of Henry M. Cottrell as first director of farmers' institutes.

COTTRELL FIRST DIRECTOR.—Not only did Cottrell organize a staff of speakers from among faculty members who could spare the time to go out over the state, but he also organized the farmers into institute groups, guiding them toward the study of problems that seemed most pressing in their particular localities and supplying information in bulletin form and through lectures to aid in the solution of such problems. There was in Cottrell's plan much attention to emergencies of the weather, climate or economic conditions, to prompt the programs which he put before the farmers during his three years of service as director. It was during his incumbency that the publication known as News Notes was first issued as a weekly clip sheet for use of editors. Much attention was given by Cottrell and by W. H. Olin, then agronomist at the college, to the dry-land region of eastern Colorado.

On Cottrell's resignation in 1910, C. H. Hinman was appointed to succeed him. Hinman followed much the same line, gradually developing a regular staff of extension speakers and organizing the work among the farmers more closely and permanently. The railroads were doing considerable agricultural development work at that time, and both Cottrell and Hinman co-operated, by supplying speakers and arranging programs, while the railroads aroused the interest of the people and furnished special trains, with exhibits and demonstrations, through which lessons in better agriculture were broadcast. All of this was gradually leading up to the more

intensive type of agricultural extension, of which county agent service is the keystone.

COUNTY AGENT WORK BEGAN 1912

County agent work in Colorado began in October, 1912, with the appointment of D. C. Bascom for Logan and W. H. Lauck for El Paso County. The first named undertook the work on a part-time basis, along with his duties as instructor in agriculture in the Sterling high school, continuing thus for several months, until arrangements were made to relieve him of his school work. Lauck began on a full-time basis October 16, 1912, having been transferred from the office of irrigation investigations of the U. S. Department of Agriculture. He had been superintendent of a field station at Eads, Colorado, where experiments were made in supplementary irrigation.

At that time county agent work for the northern and western states was under supervision of the Bureau of Plant Industry. That bureau contributed \$1,200 of federal funds for the work in El Paso County, while the county commissioners appropriated an equal sum. The Colorado Springs Chamber of Commerce provided office room, equipment and supplies, and office assistance. The agricultural committee of the chamber worked very closely with the county agent, the purpose being to establish harmonious relations between town and country and to aid new settlers on the plains of El Paso County in getting started.

There had been two or three very dry years, which left many dry-land farmers without means for carrying on, and the first practical result of the establishment of county agent work was the creation of a revolving loan fund for farmers who needed credit to buy feed and seed. This fund was subscribed by the business men of Colorado Springs and loaned to settlers, under supervision and on the recommendation of the county agent. Over 80 per cent of the loans were paid back at the end of the first year and there were no losses. This was an emergency measure that emphasized the value of county agent service when the work was new. It was, however, only one of many activities, other lines taken up including crop production, pruning and spraying fruit trees, better seed potatoes, alfalfa seeding, dairying, silo building, marketing and the organization of community clubs.

LAUCK'S TRAVELING LIBRARY.—A traveling library, which the agent carried in his automobile, proved popular. Fifty agricultural books and many bulletins were thus put in circulation. The agent spent most of his time in the field, his work partaking of the nature of a farm missionary, who carried the gospel of better agriculture from house to house in a county where the elevation of the agricultural lands runs from 5,500 to 9,000 feet,

with correspondingly varying types of farming, under both dry and irrigated conditions.

In Logan County the financial arrangements were different, the Bureau of Plant Industry, the county commissioners and the Logan County high school committee each contributing \$450, while the State Agricultural College made up the balance necessary to pay salary and expenses of Mr. Bascom. Four farmers' clubs were organized during the first few months,



Pasture demonstration tour on J. L. Tinsman farm, Severance, Colorado, County Agent H. H. Simpson answering questions about the demonstration.

and one club of farm women, the first to be formed in the state for extension work. Boys' and girls' club work also was undertaken. Communities were organized to fight grasshoppers, and much work was done in the sugar beet districts on fertility, crop rotation, insect and plant disease projects. Here, as in El Paso County, it was the dry-land farmers who seemed to be most eager to listen to the county agent. Most of them were new settlers, trying to farm under conditions which they did not understand, and they welcomed the advice of a trained agriculturist.

Pueblo County was third in line for county agent work, Stanley V. Smith, who had been an instructor in horticulture at the Agricultural College, being appointed March 1, 1913. Here, as in Colorado Springs,

the business men were chiefly responsible for starting the work, the Pueblo Commerce Club contributing \$1,800 for the first year and the Bureau of Plant Industry \$1,200. The club also furnished office quarters and stenographic service. Truck gardeners quickly took advantage of the presence of the county agent and called on him to aid in the formation of a marketing association and to advise them on soil and plant disease problems.

The San Luis Valley was next in line, Conejos, Costilla, Rio Grande and Saguache Counties joining forces with the Bureau of Plant Industry and the Agricultural College in financing the work of one man, whose duty it was to cover the entire valley. L. M. Winsor was appointed, but he served only six months, when he was succeeded by A. C. Cooley.

Dana W. Frear was state lender of county agents from the beginning of the work up to 1915. He had been transferred to that work from the Agronomy Department of the College.

COUNTY AGENT STATUTE.—The Colorado law under which county agent work was then conducted was known as Senate Bill 227. This law authorized boards of county commissioners to enter into the necessary agreements with the State Agricultural College to carry on the work, and it outlined the duties and functions of the agent in Section 2, as follows:

It shall be the duty and function of the County Agriculturist to study the farm management, and to give instruction to farmers of the county upon their own farms, and at neighborhood meetings; to aid in the development of the agricultural community; to co-operate, so far as practicable, with agricultural associations in the county whose object is the betterment of agriculture, and generally to promote agricultural development of the county and its associated interests by all suitable and approved methods; to co-operate with and act under the general direction of the State Agricultural College of Colorado and the United States Department of Agriculture.

At the end of the second year of work under this law, June 30, 1914, four agents had been added to the roster, namely: W. Harrison for Mesa; H. H. Simpson, Boulder; C. G. McCord, Morgan and E. E. Brown, Prowers County. New work taken up that year included farmers' short courses, which proved popular. In Logan County agriculture, domestic science, carpentry and blacksmithing were taught, and ninety men and women were enrolled for these courses. Farmers' tours also were started, as an effective means of passing information on better methods and practices from farm to farm. Cow testing and farm account work got under way during that year.

SMITH-LEVER LAW.—The federal Smith-Lever law, which provides for joint federal and state support of extension work, became effective May 8, 1914, and its first benefits became apparent in Colorado during the fiscal year beginning July 1, 1915. The Colorado statute which was enacted to accept the Smith-Lever law is known as Senate Bill 225 by Barela (S. L. 1915). It became effective April 9, 1915.

In September, 1915, Dr. H. T. French was appointed director of extension, the department having been supervised during the previous year by President Lory as acting director. In August, 1916, A. E. Lovett was appointed state leader of county agents, to relieve Director French of the increasing duties that came with the addition of personnel and enlargement of the scope of the work under the Smith-Lever law. By December 31, 1915, ten county agricultural agents were in service, the additional ones being George R. Smith for Adams; R. R. Jeffries, Fremont; R. C. Allred, Garfield; P. N. Flint, Kit Carson and Lincoln; E. D. Smith, La Plata and Montezuma, and Charles E. Smith, Las Animas County. Also, D. C. Bascom, who left the work for a time, to return later as agent for Larimer County, had been succeeded by George C. Burckhalter, and A. C. Cooley had been succeeded by E. H. Thomas in the San Luis Valley.

FIRST WOMAN AGENT.—E. Bula Herschler was the first woman agent, being appointed county home demonstration agent for El Paso County October 1, 1916. Good results were reported by State Leader Lovett in summing up the year's work, which included twenty-seven projects, among them silo building, crop pests and diseases, alfalfa improvement, grain smut control, rodent pest control, use of pure seed, dairy stock improvement, standardization of crops and varieties, orchard management, organization of federal farm loan associations and much emergency work.

During the war year, when additional funds became available, there was rapid, though temporary, expansion, every ounce of effort and every dollar available being put into the work for the purpose of increasing production of essential foods needed by the army in France. There were numerous changes in personnel, some of them of a temporary nature due to war exigencies, but the work was kept well under supervision, so that at the close of the period readjustment was easily accomplished.

Director French was compelled to give up the work in February, 1919, and for over a year following Mr. Lovett was acting director. Supervision of county agent administration was assumed by R. H. Felts, as assistant state leader.

SPECIALISTS ENTER THE FIELD.—Specialists in various lines were appointed as the demand for such aid to county agent work became insistent. The first specialist in home economics was Mary L. Oberlin, who served but a short time, when she was succeeded December 1, 1915, by Miriam M. Haynes, who later was made state leader of home demonstration work.

In the fiscal year ending June 30, 1920, twenty-two resignations were accepted, the year being remarkable for the big turnover in personnel. New appointments were made for most of the vacancies, there being few losses of counties. It was a period of readjustment due to post-war con-

ditions in agriculture and to the change in character of the farm bureaus, which up to 1920 had functioned as extension organizations, but had now become independent associations of farmers through the formation of the American Farm Bureau Federation. This change is recorded in detail in the section devoted to farm organizations. It proved a difficult period for extension work, but the upheaval which came in several counties finally subsided.

On July 1, 1921, Roud McCann, who had been secretary of the National Dairy Council at Chicago, was appointed director of extension, and under his administration the work has progressed, keeping pace with the advancement of agriculture in the state and setting the goal educationally for that advancement.

THE ROSTER IN 1926.—In 1926 the roster of the extension staff was as follows: Roud McCann, director; F. A. Anderson, assistant to the director; R. H. Felts, E. D. Smith, R. W. Shafer, district extension agents; Maude Sheridan, state leader of club and home demonstration work; Blanche E. Hyde, B. W. Fairbanks, Waldo Kidder, Thomas H. Summers, A. T. Steinel, C. A. Lee, O. C. Krum, Miriam J. Williams, specialists; C. W. Ferguson, club work; Warren Leonard, publicity.

The county extension agents and assistants were as follows: L. H. Rochford, Alamosa; A. H. Tedmon, Arapahoe; George R. Smith, Boulder; R. E. Kiely, Conejos; R. H. Tucker, Delta; J. C. Hale, El Paso; P. L. Smithers, Fremont; J. L. Shields, Huerfano; D. C. Bascom, Larimer; C. W. Stocker, Las Animas; L. C. Gilbert, Lincoln; J. E. Morrison, Logan; Ben H. King, Mesa; C. A. Johnson, Moffat; H. A. Ireland, Montrose; W. F. Droge, Otero; F. R. Lamb, Prowers, T. G. Stewart, Rio Grande; A. A. Goodman, San Miguel; A. A. Kroll, Teller; H. H. Simpson, Weld; Robert W. Vance, Washington; A. C. Allen, at large.

Home demonstration and club work: Velma Borschell, Logan; Beulah Winburn, El Paso; Bertha Boger, Delta; Florence Glenn, Alamosa; Dorothy Jackson, Boulder; Lydia Warren, Larimer; Elwood O. Johnson, Weld.

BOYS' AND GIRLS' CLUB WORK

STARTED IN 1914.—Boys' and Girls' Club work, which is an integral part of extension service, was begun in 1914, immediately after the Smith-Lever Act became a law. W. E. Vaplon was the first state leader. Boulder, Logan, El Paso and Las Animas Counties were the first to take an important part in the work.

Boulder County began with a corn club program that later developed into one of the really outstanding pieces of work in the state.



American teams demonstrating canning to the French at Concy, in the devastated area, in a temporary community building. Colorado team and leader at the left.

One notable feature of the first year of work with the boys and girls in Colorado was the first club camp. This was held in Monument Valley, at Colorado Springs. It was given to the two hundred club members of El Paso County by the Chamber of Commerce of Colorado Springs, under the supervision of County Agent W. H. Lauck.

For the first few years the club work of the state was carried on by the county agents and club leaders without local leadership assistance. Miss Beulah Herschler (now Mrs. George R. Smith) was the first county club leader in the state. She worked in El Paso County. Miss Herschler traveled either on horseback or with horse and buggy. She met with each club as often as possible, and no club met except when she was present. The distances covered were considerable, especially in view of the modes of transportation employed, consequently she was compelled to be absent from her office for from three to four weeks on each trip.

Club work gradually increased in the state. In July, 1916, Maude Sheridan was appointed assistant state club leader. In 1917 another assistant was added, Miss Roberta Smith. She was succeeded by Miss Eunice Kennedy in 1918. During this year two more assistant club leaders were added, namely, F. A. Chisholm and John T. Tingle.

LARGE ENROLLMENT DURING WAR.—Club enrollment increased very rapidly during the period of the war, until there were 18,000 members. During 1918 and 1919 there were forty-one paid leaders in counties, villages and cities. Many of these leaders were employed for the summer vacation months only. The city and town work of the war period consisted mostly of garden and canning clubs. Much food conservation work was done by club members during these years. At this time pig clubs had a larger enrollment than has been the case at any other period. Mr. Tingle was employed to take charge of this work only.

Club work in 1919 had 16,967 members, the enrollment being as follows in the different activities: Canning, 1,099; corn raising, 498; bread making, 610; sewing, 1,102; potato growing, 110; gardening, 11,947; poultry raising, 511; pig raising, 950; calf raising, 81; sheep raising, 37; bean growing, 22. It will be noted that there was some decrease in membership, as the city clubs were being discontinued. The canning club members canned 40,695 jars of products. Garden club members raised vegetables with a commercial value of \$55,790.

Team demonstration work was first done in canning and proved an effective means of disseminating ideas of food conservation. The outstanding work in this line was in Kit Carson County, under the leadership of Amelia Alexander, and in Morgan County, under the direction of Mrs. Roy Hale.

FIRST CANNING CONTEST.—The first state canning contest was held in the fall of 1918. At this time three Morgan County girls—Vanetta Hanscom, Gertrude Law and Dorothy Maris—were declared champions. They were later sent to Sioux City, Iowa, for a non-competitive demonstration at an exposition.

With the close of the war, the work of the cities was gradually discontinued. The method then adopted reverted to the original plan of working only with rural boys and girls. By 1922 the work had again assumed normal proportions with an enrollment of approximately 6,000.

In the fall of 1919 Maude Sheridan became state club leader, and Mr. Tingle and Miss Kennedy continued in the capacity of assistant state club leaders. In the spring of 1920 Walter R. Freeman was appointed assistant state club leader. The work of the other two assistant club leaders was discontinued at this time. Since the resignation of Mr. Freeman in the fall of 1924 the work of assistant state leader has been carried on by C. W. Ferguson. The number of county leaders and leaders employed for the summer vacation only has gradually decreased. With this decrease the county extension agents have assumed more and more of the leadership. By this plan more emphasis is given to the development of local leadership.

The various specialists of the Colorado Agricultural College extension service gradually took over more and more responsibility for the club work. This included the preparation of subject matter and the training of demonstration teams and of judging teams. For the years 1923 to 1925, inclusive, the enrollment remained near the 6,000 mark.

CORN CLUBS STAND OUT.—As previously indicated, the corn club activities of Boulder County are deserving of special mention. This work was begun in 1914, under the direction of County Agent H. H. Simpson. As related in detail in the section devoted to the corn crop, the idea of the work was to develop a type of corn adapted to local climatic conditions. The seed chosen was Minnesota No. 13. The club boys tested this corn carefully. They gave painstaking attention to its cultivation. When harvest time arrived the seed corn was carefully selected and cured according to the most approved methods. For many years the annual seed show of Boulder County was the inspiration of all corn club boys. From seed carefully selected in the field seed corn was provided for sale. This consisted of whole ears in half-bushel crates.

During the high prices these half-bushel crates sold for large sums. In 1920 there were twenty-two crates sold at auction. The first-prize crate belonged to Bernard Buster of Hygiene and was sold for \$9. It was bought by a farmer of Larimer County, who loaned it as seed to the boys of that county, who wanted to join a corn club for 1921. In the sale of January,

1921, there were forty-two half-bushel crates sold at auction. The price averaged \$6.50—or at the rate of \$13 per bushel. That year the best ear in the show was sold at auction for \$24. This ear was grown by Eugene Crosson of Hygiene, who made a net profit of \$199.95 on his season's work.

The corn club work in Boulder County continued through a period of ten years. While prices did not remain as high as those mentioned, the enthusiasm spread and functioned in many of the other counties of the state. Club work has done much to raise the standard of corn produced in Colorado and to make it a profitable and abundant crop.

CONDON'S GREAT RECORD.—The work of Raymond Condon of Weld County in 1925 may well serve as a model worthy of imitation. The following summary of his report speaks for itself:

"Raymond Condon, who was a club member in Weld County for four years, in 1925 became a leader of eight club boys. He continued his work with seed corn. In the fall of 1925 he hand-selected 10,000 pounds of seed, which he sold at 10 cents a pound, and 7,000 pounds of seed which were sold at 5 cents a pound. He could have sold many times this quantity if he had had it. From his crop he selected one hundred ears which he retained for his own planting. This was planted in 1926. One hundred grains were selected from each ear and planted in a row. From this he will select his 1927 seed corn. Raymond, now at the age of 20, has an enviable reputation as a grower of pure seed."

TEAM GOES TO FRANCE.—The splendid work begun in Kit Carson County during the war period under the leadership of Miss Amelia Alexander had much lasting effect. During the years of 1918 and 1919 Kit Carson County canning club girls gave demonstrations each Saturday in the stores of the various towns of the county. When



International Championship Canning Team: Bertha Boger; Maude Sheridan, state leader; Elaine Hendricks.

a national contest was held at Chicago in 1922 it found Elaine Hendricks and Bertha Boger so well prepared for demonstrating and so well grounded in subject matter that they easily won the trip to France arranged for by the American Committee for Devastated France. They, with the team from Iowa, represented the United States in a canning demonstration tour throughout France.

Many members of boys' and girls' clubs have continued their agricultural interest by attending Colorado Agricultural College. They have set a high standard in their college work and most of them have secured positions of more than ordinary responsibility upon graduation.

Many of these former club members have become teachers—others successful farmers. Some have, of course, entered other lines of work, but all are better citizens of their communities because of their early training in club work. Two former club members are now employed by the extension service. Velma Borschell, assistant county extension agent of Logan County, Colorado, was a member of a canning club and a sewing club in Mesa County. Bertha Boger, assistant extension agent of Mesa, Delta and Montrose Counties, was a member of the team that went to France.

CARLOT FEEDER CLUBS.—During 1921 and 1925, inclusive, several counties have demonstrated by means of club work the feeding and marketing of carload lots of hogs and calves. In Larimer County the LaPorte club secured fifty-five purebred Duroc-Jersey shoats weighing approximately 100 pounds each. The number of hogs allotted each of the nine members of the club varied according to the handling facilities and feed supply. The hogs were put on feed November 12, 1921. Accurate records of costs of hogs, feed and labor were kept from the start. Special study was made of care and feeding, including kinds of feed, nutritive value, digestibility, compounding of rations, methods of feeding, watering and general herd management.

The hogs were marketed at the time of the National Western Stock Show. They were shipped January 14, 1922, at which time they averaged 204 pounds. They had made the average gain of 104 pounds in 63 days, or $1\frac{2}{3}$ pounds per day, at a cost of 5 cents per pound. The hogs were sold at \$9 per 100 pounds. While the profits were somewhat disappointing, the experience was extremely valuable.

Many other club members have demonstrated this feeding problem. Ross Crow of Otero County has twice shipped a carload of hogs to the Denver market. The Logan County boys and the Boulder County boys have each shipped carlots of hogs and cattle.

STATE FAIR ENCAMPMENT.—The Colorado State Fair has been the mecca towards which club members of Colorado turn their faces. The

county champions gather at the club camp, which is known as Camp Tobin, named for Senator John Tobin of Montrose. In 1922 the Legislature of Colorado gave the club members of the state two dormitories for the camp.

Since 1918 the three states of New Mexico, Wyoming and Colorado have held club encampments each year at the Western National Stock Show in Denver. This has been possible through the efforts of Harry A. Youngerman of the National Western Stock Show and George T. Wells, chairman of the boys' and girls' club committee of the stock show.

A brief resume such as the foregoing can of necessity give only a hint of the extent and influence of boys' and girls' club work in the state. But to those who recognize that the greater part of what is accomplished in work of this kind can never be reduced to figures or to reports, it may serve to indicate, in a manner, that the activities of the clubs are a significant factor not only in developing and augmenting the material resources of our commonwealth, but in developing as well that superior type of manhood and womanhood that makes for better citizenship. No one can measure how far the influence of properly conducted work with clubs of rural boys and girls will extend, but of the intrinsic value of such work there can be no doubt.

SCHOOL OF AGRICULTURE

The Colorado School of Agriculture opened October 5, 1909, and is to close a period of successful operation as a secondary school with the end of the current school year, April, 1927. The school was established in response to a demand voiced by the Colorado State Grange and other farmer groups and individuals, to fill a need for vocational training for young people who had completed the grammar school and desired a more practical course of training, leading back to the farm or shop, or the farm home, such as is not given by the city high schools. Among the individuals most active in advocating the establishment of the School of Agriculture was the late Elias M. Ammons, who, as chief executive of the state and during his years as a member of the Board of Agriculture, always insisted on better educational facilities for the farm boys and girls—an equal chance for them with the young people of the cities.

Until the Smith-Hughes high schools had been established all over the state the need for the School of Agriculture was apparent. It served especially well during the post-war years, when rehabilitation work was going on at the college, and disabled war veterans were given a chance to fit themselves for a vocation, both in regular college work and in the School of Agriculture. While there are still a few sections of the state, principally in the mountains, that do not have ideal facilities for training pupils of high school age, the point was reached in enrollment where the School of

Agriculture had to be discontinued. Northern Colorado, especially, is well served by county high schools, having Smith-Hughes departments, and the consolidated rural schools are now so numerous over the state and so well equipped that the use of state funds could no longer be justified in maintaining the secondary school at Fort Collins. Southwest Colorado, however, is being well served by the Fort Lewis School of Agriculture, which is being enlarged and broadened in its curriculum from year to year.

The minutes of the Board of Agriculture meeting of June 3, 1909, make the first mention of the School of Agriculture in the following entry:

"Mr. Ammons moved that the president and faculty committee be authorized to put in this course (agricultural high school) next year and that they proceed to work it out."

Immediate action toward organization followed, the first term opening October 5th with an enrollment of 213 pupils, which was about double the number anticipated. T. M. Netherton of the Montrose high school was engaged as principal, on the recommendation of Judge John C. Bell. The choice proved a wise one, Mr. Netherton being a practical farmer as well as an educator. He suggested a six months' course instead of nine months, as had been planned, and that suggestion was adopted. Principal Netherton remained in charge for ten years, when he resigned to engage in farming. He was succeeded by Miss Margaret Durward, under whose administration the school continued to serve for training hundreds of young people for college or for their life vocation.

FORT LEWIS SCHOOL

The Fort Lewis School of Agriculture at Hesperus, Colorado, occupies what was originally a military post. The land holdings comprise 6,300 acres. The post was established in 1882 and for about ten years it was in active use, providing quarters for a regiment of United States soldiers, whose business it was to hold the Indians in check. After the troops were withdrawn in 1892 the post was converted into an Indian school. At one time 400 children were under instruction, but the attendance dwindled, and in 1910 the school was abandoned by the government. Through the efforts of citizens of Durango and the aid of Congressman Edward T. Taylor of the Fourth Colorado district, a clause was inserted in the Indian appropriation bill of April 4, 1910, offering the Fort Lewis property to the State of Colorado providing a school of agriculture, mechanics and household arts were established and maintained on the property. This offer was made by the federal government and met by the state in January, 1911, when Senator West's bill passed the General Assembly and received the signature of Governor Shafroth. The property was formally turned over to the State

Board of Agriculture at that time, and President Charles A. Lory of the Agricultural College was made president also of the Fort Lewis school.

When ex-Governor E. M. Ammons of the Board of Agriculture and Dr. Lory visited the property after it was turned over to the state they found a discouraging prospect. The buildings had been neglected and were in dilapidated condition. An appropriation of \$60,000 had been made by the General Assembly for repairs to the buildings and maintenance of the school for a two-year period. However, only two-thirds of this sum became available. Out of that fund it was necessary to remodel the dismantled buildings, furnish them for school and dormitory purposes, supply the farm with livestock and equipment and open and maintain a school for two years.

In spite of these difficulties, the plant was ready for educational work in October, 1911. Professor G. F. Snyder, head of the Teachers' Training School at Readsburg, Wisconsin, had been engaged as principal, and he was on the ground in June, 1911, where he assumed supervision of the rehabilitation of the property and engaged a staff of teachers.

Thirty-four pupils enrolled at the opening of school in October for the course in agriculture for boys and domestic science for girls. During the following school year a short course was offered for farmers and their wives, and it proved popular, forty-four enrolling. A district teachers' institute was held, with an enrollment of seventy-three.

For the second winter term the enrollment was fifty-three pupils, and the work then seemed to be on a permanent basis.

In 1913, however, the appropriation of \$45,000, which was to provide for the biennial period, was put in the third class, which meant that there were no funds in the state treasury out of which to pay it. For a time it was feared that the school would have to be closed, but it was found possible, finally, to keep the institution going, though on a limited scale.

During 1916, '17 and '18 the term was changed from winter to summer, but in 1919 courses were established for both summer and winter terms. The summer term was finally discontinued, as the enrollment was unsatisfactory, and since 1914 there has been one regular term of nine months.

Large enrollment has not been the chief aim at Fort Lewis. The attendance could easily have been doubled by lowering the standards of the school. It has been felt, however, that one student going out into a community to do effective work and become a useful, forceful and intelligent citizen, is more desirable than a great many who may be poorly equipped for the responsibilities of citizenship.

As the school is isolated from town and railroad, it is necessary to provide for the social and recreational needs of students as well as the

educational. Pupils and faculty live in a well-organized community group, practically on a family basis. The school is in a region where winter snows stay on the ground and where travel during several months is difficult. A food supply must be maintained on the property. The farm and the cold



High altitude experiment farm, Fort Lewis School of Agriculture.

storage plant, therefore, are essential. There is an electric plant, and the school also owns motor vehicles and power implements. There is a well-equipped machine shop, herds of livestock of various breeds and kinds are kept, all in use for the school and farm, as well as for teaching and laboratory work, the students thus being able to supplement their studies with practical farm-shop and farm-home work. Winter vegetables are grown in a greenhouse, which is used also for plant study during the school term, when the fields and meadows are under snow.

Considerable experimental work is done on the farm under high-altitude conditions for the benefit of the southwestern agricultural section of Colorado.

There is a dairy herd of Holsteins, some of which are registered cattle, and a herd of Hereford beef cattle, mostly registered. Oxford and Rambouillet sheep and Duroc-Jersey swine are kept. Part of the pasture land is in use for the school herds and the balance is leased to cattlemen. Coal measures underlie the property, on which, in accordance with recent legislation, leases may now be given to miners.

In athletics the Fort Lewis school is making its mark, particularly in basketball. Literary and cultural advancement is stressed and there are debating and dramatic teams and musical clubs. The school also sends a stock-judging team to the National Western Stock Show at Denver each year. While expansion has been the rule, the Fort Lewis school, like the parent institution at Fort Collins, has always lived within its income. In 1926 the faculty was composed of: G. F. Snyder, principal; Ernest Bader, farm manager and agronomist; C. C. Brooks, history and psychology; Dillon Longenbaugh, livestock; Esther Pfeleger, physics, chemistry and biology; Charles N. Alden, Latin and mathematics; Ruth P. Huber, household arts and business; Viola Enloe, English and education.

RURAL SCHOOL IMPROVEMENT

That something was radically wrong with the rural schools of Colorado was recognized by educators, if not by the general public, years ago. In that respect conditions were no worse than in many other states, but that could not be used as an excuse by any typically American commonwealth where much emphasis was put on higher education and the state was spending several million dollars annually to provide training in the professions for its youth. It was the progress of higher education and the advancement in elementary and high school training in the cities that first emphasized the difference between the advantages provided for urban youth and for those upon the farm.

FARMERS' UNION STARTS IT.—The first effective action on the subject was taken at the annual meeting of the Farmers' Co-operative and Educational Union at Glenwood Springs in 1910, when W. R. Callicotte and Dr. Charles A. Lory were put on a committee of the union, with instructions to set rural school improvement in motion. It was the opinion of the delegates at this session that Dr. Lory, being president of the Agricultural College, would be in position to take leadership in the movement. Progressive farmers were alarmed over the backward condition of the average country schools. Farm organizations discussed it in their meetings, both the Grange and the Farmers' Union urging action.

Soon after the union convention at Glenwood, Dr. Lory went to Grand Junction, to attend the annual meeting of the County Superintendents' Association. He broached the subject there and outlined the plan of the Agricultural College for appointment of a rural school visitor. He told the county superintendents that the college had been doing considerable toward improvement of crops and livestock in the state and that he thought it time to take up field work on the same general plan in rural school improvement. He found the county superintendents eager to co-operate,



The new Raymer consolidated school.



Eleven one-room schools were abandoned when the new Raymer school was completed.

for they well knew the condition and they realized the necessity for a statewide movement to bring about improvement.

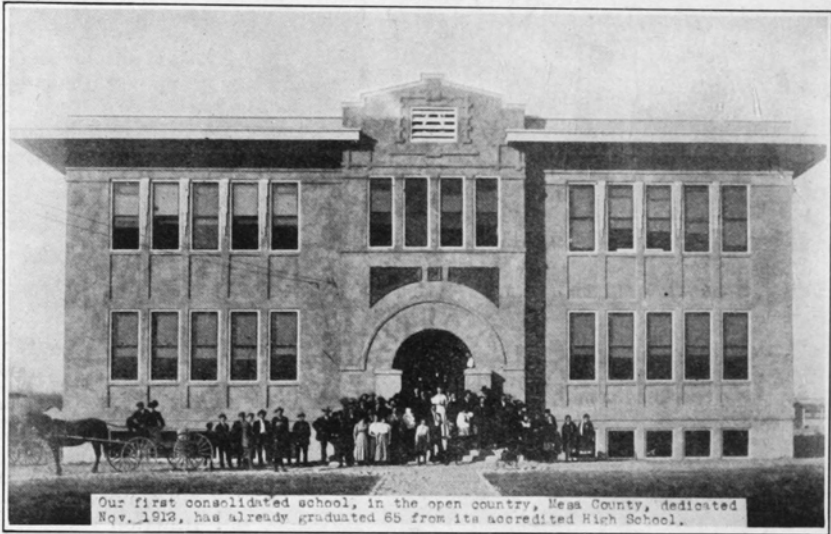
In the meantime the matter had been discussed with the Board of Agriculture, President A. A. Edwards, ex-Governor Ammons and other board members approving the suggestion for intensive efforts in rural school improvement and agreeing that the job should be undertaken by the college. Dr. Lory also had obtained the endorsement of the State Teachers' Association and the backing of that body for his program. The first thing desired was the appointment of a rural school visitor. An act of the legislature was necessary for the creation of the office, and that was passed at the session of 1911.

C. G. Sargent was thereupon appointed rural school visitor, and to him was given the task of carrying out the improvement program. He has made it his life work, and in a little over a decade Mr. Sargent has been able to accomplish what amounts to a revolution in rural education. Colorado's rural school system today stands in the front rank nationally. Many other states, moved by the example of Colorado, as shown to and discussed at sectional meetings of the National Education Association, became aroused at what Colorado discovered and followed the example of this state in improving the inadequate system of primary education in the country.

Mr. Sargent had become active in school consolidation in Mesa County, where he was county superintendent. The consolidation idea was brought from Ohio by Secretary Thomas Mahoney of the Grand Junction Chamber of Commerce. Mahoney realized that to be really attractive to high-class settlers a community must have good rural schools. It was through his efforts that the school consolidation act of 1909 was introduced in the State Legislature. The law, which was merely permissive, was passed without attracting much attention, but when it reached Governor Shafroth opposition had developed. The governor was unfamiliar with school consolidation, and as the bill apparently had no friends, he announced his decision to veto it. Word got to Grand Junction, and Mr. Mahoney called in County Superintendent Sargent. They had worked together on school improvement, and Sargent immediately got busy, with the result that the governor finally decided to sign the bill. It seemed to be a local issue anyway, involving at that time only one school district in Mesa County—the Appleton district.

APPLETON DISTRICT FIRST.—Having a state law legalizing consolidation of districts, the active campaign in the Appleton district, already under way, was put on a firm foundation. Much opposition had developed, and more than two years elapsed after the passage of the law before the Appleton consolidation was finally effected. The school was not dedicated until November 27, 1912. No less than five actions in court had to be met and

won before the three districts were made one. Two of the cases were thrown out of court, but three were heard, and before final settlement the State Supreme Court passed on the constitutionality of the consolidation law and sustained it. Mesa County thus became the cradle of school consolidation in Colorado. Loma followed Appleton, and Fruitvale was the third consolidation. Incidentally these three pioneer districts have not only remained



The Appleton consolidated school in Mesa County, the first in Colorado. Dedicated in November, 1912.

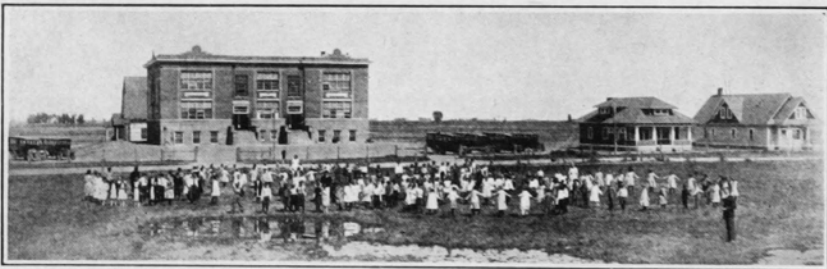
in line, but each year since building and equipping their excellent school plants efficiency has increased and they are now giving complete courses from primary grades up to and including four-year high school. Clifton has since consolidated, giving the Mesa County fruit districts a system of rural schools rated 100 per cent in efficiency.

While these consolidations were under way Professor Sargent was back of the movement; in fact, the leader of it, and with him was a group of forward-looking citizens led by Mahoney, whose popularity as a chamber of commerce secretary suffered in some quarters because of his devotion to the educational ideal. He never wavered, however, and when the fight was won in Mesa County and the pace set for Colorado, even those who had opposed, what they termed an experiment in education, were willing to admit that the Ohio idea would work in Colorado and that Sargent and Mahoney had accomplished something worth while in the development of the county.

COLLEGE ASSUMES THE TASK.—In the meantime the county superintendents had held their session in Grand Junction, where rural school improvement was in the air, and President Lory had assumed, for the Agricultural College, the large contract of pulling rural elementary education out of the rut of mediocrity. In many sections it was less than mediocre—positively decrepit.

Not only were school facilities often inadequate, but the teacher material was untrained, often indifferent, always underpaid and rarely satisfied or satisfactory. That was the rule; the exceptions were often outstandingly good in communities where farmers were progressive, but the good districts were in the minority then.

No evil of the system was so glaringly apparent as that of school district quarrels. Controversies involving community leadership, personal jealousies and petty family spats often developed into permanent factional splits, and the children suffered. In other districts it might have been a parsimonious policy that held back the school, but in a majority of the small districts it was merely indifference. That indifference proved less of a bar finally to progress than the evils of jealousy and miserliness, which have not yet been finally driven out of rural school management, and probably will not so long as it is possible for control to remain in the hands of a limited group, who are not responsible to the entire county for the manner in which tax money is expended in educational work.



The Sargent consolidated school in the open country, seven miles from Monte Vista. This plant serves the community both as school and church.

When Sargent was appointed rural school visitor, October 15, 1912, it was with the idea of rural school improvement, without specifying the means through which this should be brought about and with no thought of confining the work to school consolidation. In fact, the authorities at Fort Collins were not sure that consolidation was the remedy.

It was decided as the first step that a statewide survey of conditions should be made, and this was undertaken, along with consolidation work, which did not wait on survey results. Sentiment was created for improve-

ment and the benefits of consolidation exploited in communities that showed interest.

The first consolidation completed on the Eastern Slope was that at La Porte during the holiday period of 1912, and the Cache-la-Poudre school, as it was named, was dedicated in October, 1913. Fort Lupton was second; Parker in Douglas County, third; and then New Raymer and Kersey in Weld, and Dailey in Logan County. By that time the survey results were being made known, though the booklet giving these results, entitled "The Rural and Village Schools of Colorado,"* was not published until 1914. This survey went back over a period of eight years. Sixty-two counties and more than 1,800 school districts were covered by the investigation, which required 3,600 typewritten pages for tabulated data alone.

WHAT THE SURVEY DISCLOSED.—The survey brought out that the average school census in 1,725 districts in sixty counties was 82,174 for each of the eight years, while the average enrollment was only 64,385, or 78 per cent of the census. An average of 22 per cent did not enroll each year. This included those who had finished the eight grades, but for whom no further provision was made by these districts; many others, however, never finished the elementary course. Exhibit "A" in the survey was the figure given of 17,789 boys and girls who were not enrolled, this being the first loss recorded against the district school system.

There was a compulsory attendance law, but evidently it had not been enforced. The law was strengthened, this being one of the minor effects of the survey.

Exhibit "B" represented 25,171 who were out of school all the time on account of irregular attendance. "This is a more serious and more unnecessary loss than the 17,789 who did not enroll. In most cases irregular attendance represents dead loss to the taxpayers and untold injury to both pupils and the schools," was the comment made in the bulletin.

"Buildings and equipment are provided, books are purchased, teachers are employed for all the children who enroll, and the cost of the schools is in no way lessened, even if 49 per cent of the children enrolled are absent from school each day, as was the case in one county during the whole eight-year period."

Further analysis brought out that 78 per cent of the average enrollment, or 49,826 out of a total of 64,385, did not finish the eighth grade. In other figures, only 14,559, or 22 per cent, did graduate. This was on the basis of enrollment—those who should have been in school. On the basis of actual attendance, 63 per cent, or 24,660, did not finish the eighth grade.

*"The Rural and Village Schools of Colorado," an eight-year survey of each school district, 1906 to 1913 inclusive. By C. G. Sargent, Specialist in Rural Education, Colorado Agricultural College, 1914.

This figure, then, became Exhibit "C," constituting the third great loss recorded against the rural schools.

NONE FINISHED IN EIGHT YEARS.—In some counties only 6 and 7 per cent finished the eighth grade in eight consecutive years; in one county 49 per cent finished, this being the highest, and in one district there were no graduates from the eighth grade in any year of the eight covered by the



Part of the one-room district schools of Colorado, abandoned through consolidation.

survey. The average census in that particular district was 123; the average daily attendance 38 pupils. Only one teacher was employed, yet there were enough pupils in the district to keep three teachers busy—and not a pupil enrolled or attending finished the eight grades in the eight-year period. And there were other districts with a similar record for inefficiency, these districts being named in the bulletin, which hid nothing, but proved every statement by careful tabulations.

Other points were covered in the survey, such as length of term, special school taxes and revenues, teachers' salaries, sites and buildings, and then, by way of contrast, rural school improvement by consolidation was described

and illustrated, with photographs showing progress already made in Mesa County and in Larimer County.

The summary called attention to the fact that it cost \$13,019,959 to operate these district schools in the eight years for buildings and maintenance, which represented an annual expenditure of only \$20 for each of the 82,174 children, and that, however large the total looked, it would build and equip only one battleship. An argument was made for what is known as the "county unit," as distinguished from the district system, which, according to the survey figures, had shown its weakness and inadequacy.

WELD COUNTY HAS TWENTY-SEVEN.—When the results of the survey got into general circulation consolidation took a spurt that continued until interrupted by the war. Weld County went in strong for consolidation shortly after the movement got under way, and a dozen or more followed Fort Lupton in a short period. In fact, consolidations continued until there were twenty-seven in Weld, putting it ahead of any county in the United States for number of consolidated schools, and including in its list such justly famed school plants as that at Ault and Windsor, the latter coming into national prominence when the Windsor basketball team won the championship for the United States in 1924 at Chicago.

El Paso and Logan Counties started simultaneously, and now each of these has seventeen consolidated schools, though there was strong opposition in El Paso, where severity of weather conditions, sparse settlement and other stock arguments were advanced by the proponents of the small school district. That opposition vanished when school patrons saw the effect of the modern school plant and equipment on attendance and interest and discovered that their children were now getting not only thorough elementary training but a practical high-school course.



Center consolidated school at Center, Saguache County. This plant not only provides educational facilities for town and country, but serves as a community center.

SAN LUIS VALLEY'S FINE SCHOOLS.—The section that has attracted most attention in other states to Colorado's consolidation work is the San Luis Valley. Everything that the people of that valley take up is thoroughly done. Public spirit there is remarkably unified, and any movement that is considered beneficial receives

whole-hearted backing. It has been so with school consolidation, there being at present eight modern consolidated school plants in the valley. The work started in La Jara, where the first consolidation was completed in 1915, and in order came Sargent, Hooper, Del Norte, Monte Vista, Center, Mosca and Saguache.

In Rio Grande County (San Luis Valley) there are now (1926) only two one-room district schools still in use. Every child in that county eligible to high school has available free transportation to an accredited four-year high school.

ONE-ROOM SCHOOLS ELIMINATED.—Five of the outstanding consolidated schools of the United States are to be found in the San Luis Valley and in contiguous districts—namely, Sargent, Center, Del Norte, Monte Vista and Hooper. And within the general boundary of these five contiguous districts there is not a solitary one-room district school remaining.

Del Norte is unique in that the district runs up the valley of the Rio Grande to a mountain community known as South Fork, and two miles beyond, where the school bus picks up pupils seventeen miles from the school and at an altitude of 8,200 feet, undoubtedly the highest point reached by school transportation anywhere.

Sargent school is unique in that the plant is in the open country, miles from any town or village; that it contains within itself not only every branch of school work, including a teacherage, but also a parsonage, for this school plant serves its patrons on Sundays as a community church. It was named for Professor Sargent, whose ardent championship of school consolidation is responsible, in a major share, for the achievements here recorded.

What part the automobile has played in consolidation is realized when the size of the districts is considered. In the first few years horse-drawn vans were used. This was the case in Mesa County, as well as originally at the Cache-la-Poudre school, La Porte. Now the autobus handles the transportation and enables the pupils to attend regularly and go back and forth in a reasonable time in districts that, like Cheyenne County, have a forty-four-mile round-trip, or New Raymer with four and a half townships to cover every school day.

ONE HUNDRED EIGHTY-SEVEN CONSOLIDATED SCHOOLS.—Summing up, it may be said that there are now 187 consolidated schools in forty-three counties, ranging from one to twenty-seven in a county, and having a total enrollment of 37,000 pupils in the elementary grades with 6,500 enrolled—and attending—rural high schools. This last figure of rural high school enrollment totals more than the entire city high school enrollment in Colorado in 1899, when Professor Sargent came to the state. Six hundred abandoned one-room schools tell the other side of this story of achievement for

the youth of rural Colorado, for which Colorado Agricultural College is largely responsible.

Other publications of Professor Sargent that came out of the work of rural school improvement can be mentioned here only by title:

"Better Country Schools in Colorado."

"A Study of Colorado School Revenues, 1915."

"Consolidated Schools of the Mountains, Valleys and Plains of Colorado, 1921."

"Better Country Schools in Colorado, 1925."

SMITH-HUGHES WORK

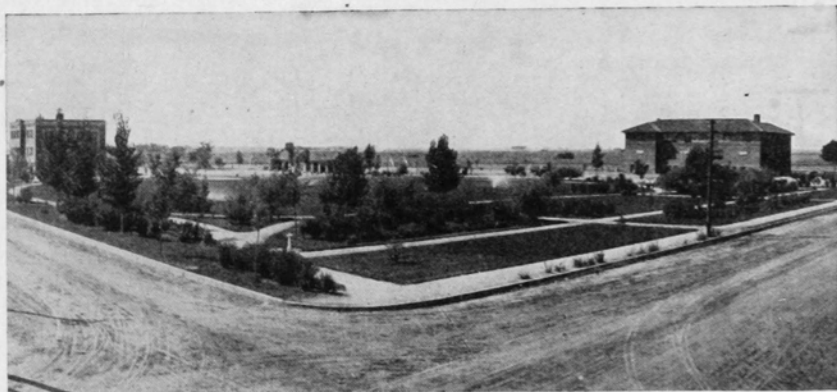
STATE ACTED PROMPTLY.—In turning Smith-Hughes work over to the Agricultural College there was recognition of the fact that this institution had pioneered in advancing rural education, as has been told in the account of rural school improvement and consolidation. To Governor Julius C. Gunter belongs the credit for directing the legislature to accept the terms of the federal Smith-Hughes Act and place its control under the State Board of Agriculture. The bill had not yet become a law when word reached Colorado of its progress, and as the session of the State Legislature was already well advanced and delay might have set back the work for two years, Governor Gunter acted immediately. When the President affixed his signature to the Smith-Hughes bill to make it the law of the nation in February, 1917, the Colorado Legislature had its acceptance bill ready for the signature of Governor Gunter. This law designated the State Board of Agriculture as the State Board for Vocational Education. This action followed agreement between the Agricultural College, the State Teachers' College and the State University.

The act of acceptance did not make any appropriation, but authorized the State Board of Agriculture to use its own funds for administration and teacher training, and further authorized it to meet the federal money on a dollar-for-dollar basis, with money raised by local school districts or by state educational institutions. In August, 1917, C. G. Sargent was appointed state director, although he had been acting as such in an unofficial way since the passage of the act the preceding February.

At the beginning of school in September, 1917, an active effort was made to organize agriculture, home economics, trade and industrial schools and teacher training classes in all three lines.

COLLEGE, THE TRAINING CENTER.—The Colorado Agricultural College was designated as the training center for agriculture, home economics and trade and industrial teachers. The first schools in vocational education actually organized were a small group of agricultural schools, including

Greeley, Logan County high school, Fort Morgan and Longmont. The first home economics schools organized were the Cache-La-Poudre and Timnath consolidated schools and the La Jara consolidated school in the San Luis Valley. Some trade and industrial classes were approved in the Denver Opportunity School and in the Denver Evening Vocational High School, and before the year was over some work was started in the mining camps



Ault Consolidated School Plant.

of the Colorado Fuel and Iron Company in Las Animas and Huerfano Counties. For the first two years there were very few classes in any type of vocational education and the work grew rather slowly. L. F. Gary was employed the latter part of 1917 as state supervisor of agricultural education. He was the first supervisor employed. In the spring of 1918 Mr. Van Dalsem was employed as state supervisor of trade and industrial education, and in July of the same year Miss Mabel Campbell was employed as state supervisor of home economics education.

With a director and three supervisors, the work could be more successfully promoted, and the number of schools and classes in all types of work continued to increase from year to year, until within three years after the passage of the act the state was using all of the state and federal appropriation available for this work. After five or six years of promotional work, all lines of vocational education have become firmly established and much of the lack of interest, and some active opposition which was apparent in the early years, seem to have entirely disappeared and vocational education of all types in Colorado now is on a secure footing.

COMPARATIVE FIGURES SHOW GROWTH.—A brief comparison of the fiscal years 1924-1925 and 1925-26 will indicate the rapid growth of the enrollment in classes in vocational education. During the fiscal year 1924-1925 there was a total enrollment of 5,583 men and 2,301 women, or a

grand total of 7,884 students in all types of classes in vocational education. During the fiscal year which closed June 30, 1926, there was co-operation with 152 different schools and state educational institutions in the promotion of classes in vocational education. There was a total of 450 different classes and an enrollment of 9,668 male students and 2,340 female students, making a grand total of 11,989 students enrolled in all types of classes in vocational education. There were 98 teachers in agricultural classes and 151 teachers in trade and industrial classes; 61 in home economics classes and 21 in teacher training classes, making a grand total of 331 teachers employed in teaching all types of vocational education during the year.

In 1917, when the National Vocational Education Act was passed, there was practically no work being done in any line of vocational education; in the year that closed June 30, 1926, there was expended for all types of vocational education the sum of \$214,668.12. The above figures will show the rapid growth of this work in the brief span of a single decade.

Fifty-one Colorado high schools are teaching vocational agriculture, the courses ranging from two to four years. Thirty-two different communities conducted evening classes in vocational agriculture of at least ten sessions each and a total enrollment of 1,313; five communities conducted part-time classes in vocational agriculture with an enrollment of 60 young farmers recently out of school. Classes in vocational agriculture were conducted in 27 different counties; home-making classes in 21 counties; trade and industrial classes in ten different counties, making a total of 35 counties in which classes in vocational education were conducted during the past year.

The executive staff consists of: C. G. Sargent, director of vocational education; L. R. Davies, supervisor of agricultural education; R. W. Foard, itinerant teacher trainer; Mary Blodgett, supervisor of home economics education; H. A. Tiemann, supervisor of trade and industrial education; H. C. Stillman, trade and industrial teacher trainer, Pueblo; F. C. Miller, trade and industrial teacher trainer, Trinidad.

FORTY-THREE YEARS OF FAITHFUL SERVICE

William Kelley holds the record for length of active service at Colorado Agricultural College. He was employed March 11, 1883, as janitor, and in 1926 he was still on the job as head janitor and campus mail carrier. He has served under four administrations and given forty-three years of faithful labor to the institution. Though his position is humble, he is looked up to by students and faculty, exemplifying as he does the value

of loyalty in service to the state. Like the walnut trees which he transplanted as one of his first tasks in improving the campus in 1883, and which have grown to the full stature of forest giants now shading Ammons Hall, so has William Kelley become rooted in the heart of the C. A. C. organization. He saw the elms set out on Shady Lane when they were saplings and the silver spruces in front of Old Main, now as tall as the tower, were making their youthful growth up in the mountains when Kelley came. He started fires in the stoves, swept dormitories and class rooms and rang a hand bell that called students to classes in the eighties. Thousands of students have come and gone, hundreds of "profs" have done their grind and worn out at it, and Kelley has kept the campus tidy for them all. Kelley still carries the mail, uncomplainingly traversing his daily route, always good humored, a sage and patriarch, the personification of faithful service.



Kelley carries the mail.

LITERATURE THAT INFLUENCED AGRICULTURE*

THE READING AGE.—This has rightly been called the "reading" age. Today there are a hundred newspapers, magazines, periodicals and bulletins of all kinds published compared with less than ten twenty years ago. The development of this interest in reading in the American people has made it comparatively easy to get information of all kinds to them.

Especially is this true with the agricultural colleges. To get before the people the great mass of information—both new and old—that is constantly being assembled by the scientists and investigators is a problem which always confronts those engaged in research work everywhere.

*This resume on bulletin service prepared by I. G. Kinghorn, Editor of Publications, Colorado Agricultural College.

Since the general public is quite specific about the subjects in which it is interested and since it is quite willing to read bulletins and circulars, the problem of distributing new discoveries has been greatly simplified. There are, of course, those who prefer to see new information in exhibit form. There are those who prefer to hear it spoken in talks and lectures. But the great majority of people are satisfied—in fact, anxious—to get the important details in bulletin form.

As a natural consequence of this tendency nearly everything which the Colorado Agricultural College wishes to get into the hands of the people of the state is published in bulletin form. These bulletins have been classified as popular and technical—the circulation of the more technical bulletins being limited to scientists and investigators in similar institutions. The bulletins have also been standardized as to size, shape, style of type and cover page. More and more attention is being given to the presentation of the material in the bulletins, the idea being to cut out all unnecessary details, making them just as short and readable and understandable for the layman as possible.

The enormous increase in the demand for these bulletins is conclusive proof that the public uses them. That their use is beneficial is evident from the rapidity with which new practices in the home and on the farm are established.

NEARLY 700 BULLETINS ISSUED.—Naturally some subjects are more popular than others. A survey of the nearly 700 publications issued by the Colorado Experiment Station and Extension Service during the past thirty years shows the popularity of bulletins as follows:

Household Problems	58
Insects and Insecticides	45
Fruit Growing and Handling.....	33
Irrigation in All Its Phases.....	29
Plant Diseases	27
Soils and Their Tillage.....	26
Alfalfa, Hay, Forage and Pastures.....	25
Vegetables, Their Production and Marketing.....	23
Potatoes	21
Poultry	21
Animal Diseases	19
Weeds and Their Control.....	18
Small Grains	18
Boys' and Girls' Club Work.....	17
Beets	16

There are nearly 100 more subjects, including dairying and dairy cows, sheep and sheep feeding, cattle and cattle feeding, seeds and seed testing, dry farming, engineering on the farm, corn growing, swine and swine feeding, marketing, both co-operative and individual, horses, rodents, adobe

houses, farm machinery and its care, climatology and meteorology, concrete on the farm, etc.

Nearly all of the college bulletins have had a good circulation, especially among the rural people of the state. To say which ones have done the most good is impossible. In the early days of the Experiment Station, the bulletins on irrigation, dealing with the methods of handling and measuring water, were very popular. Most of the methods and practices advocated in those early bulletins are today common practices in the irrigated sections of Colorado.

MANY ON INSECT CONTROL.—Dr. C. P. Gillette and other entomologists at the college have issued a total of 45 bulletins on insect pests and their control. The Department of Entomology has done a remarkable piece of work in enabling the farmers in all sections of the state to keep closely in touch with means of combating these pests.

Likewise the botanical research men and plant pathologists have aided materially in controlling plant diseases; the animal husbandry and veterinary medical men, the control of animal diseases.

In the early days of the institution, the work done with beets, potatoes, alfalfa and grains, especially wheat, resulted in definite and important progressive strides in the state's agriculture. In more recent years the college has given considerable attention to feeding problems, not only with sheep and cattle, but with swine and poultry. The late bulletins issued on these subjects have been among the most popular.

In more recent years the farmer's wife and children have received aid that was not even available, let alone in demand, in the early days of the college. Specialists have made comprehensive studies of the farm-home problems in an effort to simplify and save labor, beautify and modernize the rural home. Only in the last ten years has this type of bulletin become really popular, and the reason for this popularity is undoubtedly due to work in the Boys' and Girls' Clubs.

This brings us to another phase of the bulletin service from the college, namely, that for the Boys' and Girls' Clubs. While the number of specific bulletins for this work is next to the bottom of the above list, in all probability it should be near the top because a large number of bulletins from all the other classifications are used in the Boys' and Girls' club work.

STANDARD STATION BULLETINS.—Among the individual bulletins issued by the Experiment Station which have been in greatest demand are:

No. 150, by L. G. Carpenter, on the Measurement and Division of Water, issued in 1909, is yet standard among irrigation engineers all over the world.

Vegetable Growing in Colorado, by R. A. McGinty, first issued in 1914 as Bulletin No. 199, has been revised twice and gone through four editions. It is now No. 276 and the demand is increasing annually.

Bulletin No. 211, by George H. Glover and W. W. Robbins, on Colorado Plants Injurious to Livestock, issued in 1915, is very popular with the cattlemen of the state. In fact, all the bulletins regarding livestock have had a good circulation among the ranchmen and farmers.

Colorado Plant Diseases, No. 259, by J. G. Leach, had to be reprinted in 1924 on account of the great demand. It is a very complete text for Colorado farmers, fruit growers, gardeners and everyone engaged in agricultural pursuits. It has also had quite a wide circulation outside of the state.

Poultry bulletins have become very popular in recent years, and Bulletin No. 202, Sod Disease of Chickens, by Drs. I. E. Newsom and Wm. H. Feldman, had to be reprinted in 1925.

With the introduction of head lettuce growing in the higher altitudes of Colorado, the Bulletin No. 283, Head Lettuce in Colorado, by R. A. McGinty, met a ready reception in all those districts. That subject was also covered in a more recent bulletin by Professor McGinty entitled High Altitude Vegetable Growing, No. 309.

Bulletin No. 290, Beautifying the Home Grounds, by E. M. Lowry, filled a distinct need for rural as well as suburban home-owners. It was well illustrated and, being the only publication of its kind available at the institution in bulletin form, it has had an extensive circulation.

Dairymen and creamerymen of the state, in Bulletin No. 295, entitled Make the Dairy Pay, by F. E. Ball, which is really a revision of No. 202 by Roud McCann, have found a brief text covering all the main points of their business, and they are using it constantly.

Bulletins on household subjects have not been very plentiful in the Experiment Station output, but No. 298, Principles of Making Fruit Jelly, by Dr. N. E. Goldthwaite, while it was only issued in 1925, has had wide circulation all over the United States. It is of value and interest to the technically trained housewife as well as the one whose training has come from experience.

Sheep Production in Colorado, No. 304, by Dr. C. I. Bray, and Diseases of Colorado Feeding Lambs, No. 305, by Drs. I. E. Newsom and Floyd Cross, have been two of the most popular livestock bulletins issued from the station. No. 305, while it only had half the original edition of No. 304, had to be reprinted within a year's time, and the demand is still very steady.

EXTENSION SERVICE LITERATURE.—Among the Extension Service Bulletins, nearly all have had good circulation because there are no technical bulletins among them.

Interest in poultry raising has grown rapidly in the state in the past ten years and Bulletin No. 126, entitled *The Poultry House*, by W. E. Vaplon, in 1917, started the movement off rapidly. Since then there have been sixteen bulletins on poultry subjects issued, most of them by O. C. Ufford, Paul C. Jamieson and O. C. Krum. No. 198-A, *How to Select a Good Flock*, by Jamieson, has been reprinted twice, its popularity being due to the wave of interest in culling. Krum's bulletin, No. 234-A, *Feeding for Commercial Egg Production*, issued in 1924, has also had a wide distribution.

Dairying has grown to be quite an industry in the state, and Bulletin No. 127, *Management of the Dairy Herd*, by R. W. Clark, issued in 1917, has been reprinted and revised several times under the same and different titles. No. 232-A, *Feeding Dairy Cows in Colorado*, by Lascelles and Crowe, deals with the more recent developments in the dairy industry, especially in feeding, and farmers and dairymen all over the West are using this bulletin as a guide in their dairy work.

The Storing of Vegetables for Home Use, first discussed in Bulletin 131, later in 145 and 174-A, by Dr. E. P. Sandsten and R. A. McGinty, has been a very popular subject for the last ten years. New developments in this field have made the subject one of interest to city folks as well as rural people.

Dr. George H. Glover has written several popular bulletins on animal diseases for the Extension Service, his bulletin on *Prevention of Some Hog Diseases*, No. 156-A, probably having had the greatest circulation. Dr. I. E. Newsom has also written several bulletins along this line, including *Hemorrhagic Septicemia in Sheep*.

Alvin Kezer, Waldo Kidder and G. S. Ray have kept the bulletins on corn growing in Colorado up to date from year to year, as progress has been made in that industry in this state. They have issued a total of seven bulletins on the subject of corn growing alone, with a total circulation of nearly 50,000 copies.

Fitting Livestock for Show, No. 171-A, by Dr. C. I. Bray, has been reprinted two or three times and is still very popular among the cattlemen and boys' livestock clubs of the state. Dr. Bray has revised it, keeping it up to date in every respect. Dr. Bray's other bulletins, *Steer Feeding in Colorado*, No. 195-A, and *Purebred Sires Produce Profitable Cows*, No. 235-A, have also been very well adapted to use by the farmers, if their demand is a criterion.

HOUSEHOLD SUBJECTS POPULAR.—The series of household bulletins by Blanche E. Hyde, including the Sewing Handbook, a bulletin on Undergarments, Simple Articles for Clothing, Hat Making, etc., is probably the most extensive and most complete of any series on clothing issued by an agricultural college in the United States.

Curing Meat on the Farm, Bulletin No. 211-A, by Harry H. Smith, has also been in quite constant demand from the farmers and housewives of the state. It has been reprinted twice.

The two series of bulletins by Mary Collopy have been very popular, the first on Dishwashing, Cleaning the Cupboard, Care of the Range, Fire and Wood Box, Care of Lamps, etc., with its clearly written and well-illustrated text, having the greatest circulation in the rural districts. Her last series on Salads, Sandwiches, Milk and Its Use, Vegetables for Every Day, Planning the Family Meal, Simple Desserts, and Serving in Large Quantities, will undoubtedly have as complete a circulation in the cities and towns as it will in the country. It has only been in circulation about one year and the first edition is already nearly exhausted.

The Boys' and Girls' Club bulletins by Maude Sheridan, W. E. Vaplon and other club workers have totaled 17 and have probably had more direct influence on the life of the rural boys and girls of the state than any other one thing. Most of them have been reprinted several times and new ones are constantly being planned and prepared.

By the demand for and willingness of the people of Colorado to read of the newer and better methods in agriculture and home-making, the Agricultural College, through its scientists, research men and specialists, has been able to do its full share in meeting the common problems.

BOOKS BY FACULTY MEMBERS.—Members of the faculty of Colorado Agricultural College have enriched the literature of agriculture with textbooks and scientific works, as the following list of titles will show:

"Fruit Growing in the Arid Regions," Wendell Paddock and O. B. Whipple; Macmillan Company, New York, 1910.

"American Irrigation Farming," Walter H. Olin; A. C. McClurg & Co., Chicago, 1913.

"The Law of Irrigation," Charles F. Davis; Publishers' Press, Denver, 1915.

"Arid Agriculture," B. C. Buffum, 1909.

"Sixty Lessons in Agriculture," B. C. Buffum; American Book Co., 1913.

"Flora of Colorado," P. A. Rydberg; Colorado State Experiment Station, 1906.

"Botany of Crop Plants," Wilfred W. Robbins; P. Blakiston's Son & Co., Philadelphia, 1924.

"Rocky Mountain Wild Flower Studies," B. O. Longyear; Merchants Publishing Co., Denver, 1908.

"Management of the Farm," Llewellyn A. Moorhouse; D. Appleton and Company, New York, 1925.

"Practical Activities in Animal Husbandry," G. A. Schmidt and Charles I. Bray; The Century Company, 1926.

"Projects and the Project Method in Agricultural Education," G. A. Schmidt; The Century Company, 1926.

"New Methods in Teaching Vocational Agriculture," G. A. Schmidt; The Century Company, 1924.

"A Laboratory, Field and Project Guide in Elementary Agriculture," G. A. Schmidt, D. Appleton and Company, 1920.

"An Introduction to Agriculture," A. A. Upham and G. A. Schmidt; D. Appleton and Company, 1919.

Index for History of Agriculture

Page		Page	
Abilene movement	118	Allen's (B. T.) letter on farming....	49
Abilene, first herd	119	Alvarado plant first in U. S.	289
Adams' L-C herd	161	American Farm Bureau Federation..	360
Adams' (J. W.) conclusions.....	270	American irrigators in California...	239
Advisory Council formed.....	357	American mill, first	29
Agriculture neglected.....	206	American population in California...	240
Agricultural College aids	294	American type citizens.....	80
Agricultural Colonies and Coloniza- tion of Labor, Chapter X.....	383	Ammons, first president.....	163
Agricultural statistics	88	Ammons opposes forest service.....	157
Agricultural report, 1861	188	Ancient irrigation works.....	170
Agricultural societies	67	Ancients, back to the.....	244
Agricultural society of Southern Colorado	60	Animal investigations work.....	568
Agricultural society proposed	54	Apple show, National.....	515
Agricultural society formed	55	Apples at \$1.25 each.....	502
Agricultural Education, Chapter XV..	583	Appleton first consolidation.....	631
Agricultural College (See Colorado).	583	Arapahoe Claim Club.....	40
Agronomy research	551	Arid conditions known	183
Aguardiente	171	Ark. Valley Experiment Station.....	555
Akron field station	559	Arkansas, farming on the.....	49
Alfalfa—		Arkansas, trapper settlement.....	20
alfalfa in 1863.....	411	Arkansas, settlements on	19
first grown in Denver.....	411	Arsenical poisoning	546
seed from Mexico.....	411	Artesian waters	231
Downing extensive grower.....	411	Assessors take crop data.....	477
on Rio Grande 200 years.....	412	Austin experimental orchard.....	579
Perrin an early grower.....	412	Autobee ranch	47
seed from Sacramento.....	412	Avon experimental farm.....	579
Field and Farm clears doubt.....	412	Aylesworth (B. O.) director.....	324
Feebles brings in seed.....	412	Bachelor (W. N.), sheep breeder...	146
Union colonists plant.....	412	Bacteriological research	549
Wilcox confirms	412	Bailey, a Fifty-niner	122
Downing farm	413	Baker's brand register.....	127
Downing writes	413	Bear creek journey.....	64
farmers object	414	Beauty, the missing factor.....	318
root is traced.....	414	Bee Keeping	462
Governor Hunt's test.....	415	brought by immigrants.....	462
Meeker writes Hunt.....	415	McBroom had first colony.....	462
Union colonists skeptical.....	415	Knight's historical sketch.....	463
looks like a weed.....	415	commercial start in 1870.....	463
Tenney tries it.....	416	State Beekeepers organize.....	464
Pueblo in 1868.....	416	honey crop in 1892.....	464
Rocky Ford, 1877.....	416	Delta county starts.....	464
Boulder county, 1871.....	416	production figures	464
many claim credit.....	416	Beef breeds, other	161
scientific discussion	417	Beef cattle breeding	159
bulletin by Headden.....	418	Beef production begins.....	110
discovery	558	Beef production, cost of.....	571
weevil	575	Beef was cheap	110
		Beet experiments reviewed	298
		Beet growing bulletin	295

	Page		Page
Beet income \$20,000,000	307	Canals, network of	202
Beet labor in Arkansas Valley	408	Canning contest, first	622
Beet growers Marketing Assn.	338	Canning industry	519
Beet premiums at fairs	291	Canning team to France	622
Beet sugar bounty	291	Canon City irrigation	66
Beet sugar editorial	281	Canon City ranches	66
Beet sugar promotion	291	Cantaloupe industry	522
Beet tests, Arkansas Valley	297	Cantaloupe industry aided	557
Beet tests by farmers	296	Cantaloupe statistics	525
Beet tests in 1869	284	Cantaloupes to London	523
Beet tests in U. S. Mint	287	Carlot feeder clubs	624
Beets mentioned in 1841	282	Carpenter's (L. G.) testimony	215
Beets at Saguache fair	87	Cattle, basis of barter	117
Beets tested at Lehi	302	Cattle, buzzards got the	141
Bent's Fort, farming at	16	Cattle, Colorado shipments	120
Bent's Old Fort	23	Cattle, first trainload	119
Black alkali problem	548	Cattle growers' problems	570
Blinn's alfalfa discovery	558	Cattle in 1871	122
Blount's early tests	541	Cattle, millions driven north	141
Boat traffic on Platte	188	Cattle over divide	164
Boys' and Girls' Clubs	619	Cattle, skinning carcasses	144
Boomers were optimistic	252	Cattle trailed in 1846	107
Books by faculty members	646	Cattle were valueless	117
Botany research	577	Cattle, winter losses	143
Boulder county's first farmers	50	Cattleman and Indian	130
Boulder ditches	204	Cattle on plains	134
Boulder started in 1866	510	Cattle value 1877	134
Bowles and Colorow	131	Census of 1860	80
Brandbook, the Colorado	126	Central City locust visitation	76
Branding, antiquity of	126	Cheese, Colorado made	85
Brands, confusion of	126	Cherry Creek flood	83
Brand registration	127	Cherry Creek journey	64
Brewer's (Justice) opinion	214	Cherry orchards flourish	513
British cattle companies	139	Cheyenne Wells demonstration farm	276
Bronco, a Spanish term	126	Chilcott (E. C.) outlines U. S. work	262
Broom corn grown by Perrin	59	Child labor problem	408
Brothers' orchard, 1868	503	Chisholm trail	118
Bryant on California farming	238	Chivington's strategy succeeds	93
Buffalo bones	115	Chivington in command	92
Buffalo chase out cattle	122	Church starts Herefords	160
Buffalo hunted for hides	114	Civil War's effect	112
Buffalo, killing estimate	114	Claim clubs	39
Buffalo meat as food	115	Claim club constitution	41
Buffalo, Indians' meat	116	Claim holders, rights of	44
Buffalo protection urged	115	Clark, Horace G.	227
Buffalo served at hotels	115	Clark (J. Max), statement of	85
Buffalo, slaughter of	113	Class consciousness	71
Buffum (B. C.) tests	266	Clay (John) reads the signs	153
Bulletin service reviewed	642	Clear Creek valley district	503
Bull's Head corral	122	Climate data, no	195
Burlington railway	488	Clover seed tests	556
Butter, premiums on	85	Club boys' record	444
Byers lived on farm	53	Code of Agriculture	316
Byers (Wm. N.) stakes farming claim	53	Colfax's (Schuyler) opinion	97
Cabbage, \$5 a head	521	College, the training center	638
Cache-la-Poudre valley, '82	203	COLONIES:	
California beginnings	237	Chicago	392
Camels for transport	112	Longmont, the center	392
Cameron (General R. A.)	198	officers of	392
Campbell system	264	Boynton's history	393
Canal building overdone	206	seventy thousand acres	393
		English colonists	394

	Page		Page
COLONIES:		Colorado Agricultural College	
typically rural.....	394	Blount, Professor of Agriculture....	589
Fort Collins.....	395	Annis taught chemistry.....	589
German.....	396	athletics get bad start.....	590
military escort.....	397	McClelland's recollections.....	591
Wulsten, the leader.....	397	experimental work starts.....	593
Congressional grant.....	397	"Ten Nights in a Bar-room".....	593
Pueblo welcomes.....	398	Farmers' Institute started.....	593
ill-fate pursues.....	399	curriculum keeps pace.....	594
survivor's story.....	400	State Board of Agriculture.....	595
farmers were few.....	401	State Board presidents.....	595
Georgia.....	395	presidents of college.....	596
Mormon.....	401	resident instruction.....	596
Brigham Young plans.....	401	irrigation engineering.....	597
Utes unfriendly.....	402	Mead teaches irrigation.....	598
settled on Conejos.....	402	Carpenter goes abroad.....	598
not welcome.....	403	prejudice against science.....	599
polygamy feared.....	404	Aylesworth sums it up.....	599
leader admits concubinage.....	404	livestock seeks recognition.....	600
colonists hospitable.....	404	agricultural division.....	601
prejudices overcome.....	404	Carlyle was Dean.....	601
St. Louis-Western.....	390	Morton takes charge.....	601
Tennessee.....	391	Kezer heads agronomy.....	602
Green City.....	392	agronomy course.....	602
Union:		botany course.....	602
Meeker's idea.....	384	entomology course.....	602
history in brief.....	384	home economics course.....	602
equipment of colonist.....	385	horticulture course.....	603
lands at auction.....	385	mechanical engineering.....	603
population in 1871.....	386	electrical engineering.....	604
had town homes.....	386	veterinary department.....	604
colony officers.....	386	farm economics.....	605
Greeley's article.....	387	forestry.....	605
Meeker paints rosy picture.....	387	military department.....	607
buffalo meat popular.....	387	rural and vocational education.....	608
machinery in demand.....	388	chemistry.....	608
Greeley fence.....	388	mathematics.....	609
La Grange's farm.....	390	English and history.....	609
La Grange's trees.....	390	languages.....	609
small farms favored.....	390	physics.....	609
irrigation achievements.....	390	physical education.....	609
Colony, Dearfield Negro.....	405	music.....	609
Colonization policy, Mexican.....	239	summer session.....	609
Colorado Agricultural College.....	583	College library.....	609
Land Grant Law.....	583	Lory administration.....	610
location fixed in 1870.....	583	Colorado & Southern.....	488
Fort Collins donates land.....	583	Colorado Farmer, the.....	483
board of trustees.....	584	Colorado Honey Producers.....	336
appropriation, \$1,000, first.....	584	Colorado Livestock Record.....	484
Christmas tree nets \$80.....	584	Colorado Potato Growers.....	326
building erected.....	584	Colorado river pact.....	225
Grange farms land.....	585	Colorado 37 oats.....	552
state assumes control.....	585	Colorado State Fair.....	475
Board of Agriculture created.....	585	Colorado State Farm Bureau.....	359
Alford and Meldrum.....	586	Colorado State Grange.....	366
Alford relates incident.....	586	half century of progress.....	367
college considered a joke.....	586	Colorado organized in 1873.....	368
Old Main cost \$7,000.....	586	Tenney brings inspiration.....	370
cornerstone is laid.....	587	purchasing agent.....	371
Shattuck delivers oration.....	587	bank proposed.....	371
no modern devices.....	589	Ceres makes report.....	372
opened 1879.....	589	co-operative purchases.....	373

	Page		Page
Colorado State Grange:		Costilla river, crossing the.....	173
irrigation discussed.....	374	Cottrell first director.....	614
woman suffrage proposed.....	375	Cottrell (H. M.) makes survey.....	312
Mrs. Washburn urges suffrage....	375	Council of Defense.....	494
backs College.....	375	County agent's achievement, a.....	442
struggle against debt.....	377	County agent statute.....	617
Booth serves seven terms.....	378	County agent work.....	615
mutual fire insurance.....	379	Court martial in secret.....	95
Morris, master 18 years.....	380	Cowboy, pony and steer.....	125
Colorado "State" lottery.....	81	Cow-chips for fuel.....	258
Colorado station organized, 1888....	542	Crop acreage 1866.....	61
Colorado Stock Growers' Assn.....	156	Crop Chronology and Events of Im-	
Colorado Wheat Growers.....	333	port to Agriculture, Chapt. XI..	411
Colorado Year Book, the.....	477	Crop estimates for 1862.....	51
"Colorado's Agriculture".....	315	Crop reports, had no.....	320
Colorado's crop rank.....	478	Crop Reporter, the.....	477
Colorado's rank in irrigation.....	233	Crop-sharing plan.....	66
Colorado's unique development.....	317	Crop yields estimated.....	61
Coloradoans called murderers.....	94	Crops by irrigation 1750-1800.....	171
Colseas barley.....	554	Crops of the Mexicans.....	30
Complaint, a farmer's.....	497	Crowley pioneered at Rocky Ford...	502
Condon (Raymond) state corn cham-		Cuchares, along the.....	66
pion.....	444	Cuchares, on the.....	36
Congress elects officers.....	265	Culebra, village on the.....	22
"Conquest of Arid America".....	236	Daily Record-Stockman.....	484
Co-operative beet growing.....	286	Dairy Farming.....	451
Co-operation in Union Colony.....	319	on the Huerfano.....	48
Co-operative marketing starts.....	318	prospects.....	125
Co-operation, ripe for.....	322	butter and cheese in '59.....	451
Co-operative vegetable marketing....	522	Poudre Valley herds in '68.....	451
Corn.....	434	cow testing record in '69.....	452
Parkman describes.....	20	Wet Mountain Valley cheese fac-	
fields large.....	65	tory.....	452
on Hermosilla ranch.....	65	Valmont cheese factory.....	453
indigenous crop.....	434	La Grange's dairy herd.....	453
Cliff Dwellers grew.....	434	leasing out cows.....	454
petrified ear found.....	435	high altitude dairy.....	454
two kinds of.....	435	condenseries, producing for.....	455
pioneers brought seed.....	435	Johnstown district.....	455
Parkman saw field.....	436	Dairy Commissioner's work.....	456
Santa Fe traders.....	436	Defiance wheat.....	551
tall stalks in '59.....	436	Deflation.....	498
600-acre field in '61.....	436	Deforestation causes floods.....	217
wagon train of.....	436	Delta county kept steady.....	511
Miles claims high yield.....	437	Denver & Rio Grande Western.....	490
Arnett's breeding test.....	438	Denver, flour reaches.....	32
early overproduction.....	438	Denver Union stock yards.....	163
in the seventies.....	439	Dept. of Agriculture beet tests.....	289
Longmonters grew it.....	439	Directors who have served.....	544
Swadley.....	440	Ditch companies, common carriers...	208
Pride of the North.....	440	Dodge City, trail center.....	140
tests at college.....	441	Dodge (Major) Expedition.....	21
Bulletin No. 2.....	441	Domestic and power supply.....	224
Rocky Ford's early record.....	441	Dougherty, Newton C.....	358
Parsons' strain.....	442	Doyle came in 1840.....	48
Minnesota No. 13.....	442	Doyle ranch.....	47
first corn show.....	443	Dotson's ranch.....	200
record in 1926.....	445	Dream come true, a.....	527
Rocky Ford tests.....	445	Dry farming by resolution.....	266
statistics.....	445	Dry Farming, Chapter VII.....	245
clubs stand out.....	622	Dry Farming Congress.....	262
Cost of living.....	81	Dry Farming Congress.....	268

Page	Page		
Dry farming defined.....	245	Farmers' Union, Colorado.....	342
Dry farming, future of.....	275	Farmers' Union "Co-ops".....	322
Dry farming, no faith in.....	205	Farmers' Union officers.....	345
Dry farming opposition.....	264	Farmers' Union starts it.....	629
Dry land tests, first.....	247	Farmers win water fight.....	207
Dugouts plentiful.....	257	Farming, complete picture of.....	67
Economic conditions upset.....	494	Farming, growth of.....	87
Economic Development of Agriculture, Chapter IX.....	311	Farming vs. Gold Digging.....	53
Editorials on Agriculture.....	51	Fat cattle sale, first.....	110
Elbert outlines irrigation law.....	193	Federal aid opposed.....	70
Elliott (R. S.) makes tests.....	247	Federal Land Bank.....	362
Emigrants still coming (1866).....	62	Feeding steers.....	151
Enrollment during war.....	621	Feeding tests.....	568
Entomology research.....	574	Fellows' engineering record.....	535
Equity Union active.....	322	Fellows' penetrates gorge.....	530
Evans (Gov.) on farming.....	50	Fences, none to hinder.....	133
Exclusive rights claimed.....	130	Feudalism, revival of.....	128
Exhibit at Capitol.....	515	Field and Farm.....	483
Exhibits of cattle.....	113	Financing Potato Growers.....	330
Expedition of Major Dodge.....	21	Financing the farmer.....	362
Experiment Station aid.....	517	Fire insurance, mutual.....	365
Experiment stations at work.....	267	First demonstration train.....	491
Exploration of ruins (Jeancon).....	169	Flour, Easterday advertises it.....	33
Exploration was necessary.....	530	Flour from Bear creek.....	35
Explorers, period of.....	14	Flour from Salt Lake.....	185
Explosives to produce rain.....	261	Flour, price of.....	51
Export basis in food production.....	316	Flour reaches Denver.....	32
Extension staff roster.....	619	Flour sold by Doyle & Co.....	32
Extension Service, history of.....	611	Fontaine, down the.....	19
Fair Association buys land.....	60	Fontaine valley in '68.....	65
Fair, Boulder county, 1876.....	86	Food imports in 1874.....	311
Fair of 1876.....	85	Food imports, total millions.....	313
Fair, Longmont buys ground.....	86	Food inspection, municipal.....	566
Fair, Saguache, 1877.....	86	Food, much is imported.....	83
Fair, territorial, 1866.....	58	Food production.....	83
Farm Bureau changes.....	361	Foreign immigrants few.....	80
Farm Bureau, State.....	359	Forestry.....	457
Farm economics research.....	576	issue raised.....	195
Farm journals doubtful.....	254	an agricultural crop.....	457
Farm laborers colonized.....	406	constitution recognizes.....	458
Farm News, the.....	486	first laws in 1881.....	459
Farm population grows.....	315	Colorado Forestry Association.....	459
Farm press, influence of.....	481	White River Reserve.....	460
Farm statistics, how gathered.....	476	opposition to Forest Service.....	460
Farms are abandoned.....	528	Stone's great service.....	461
Farmers and the war.....	492	Great Plains planting.....	461
Farmer, financing the.....	362	statistics.....	462
Farmers' Claim Association.....	41	research.....	580
Farmers' Clubs, Boulder.....	70	Fort Garland, view of.....	174
Farmers' Club, Clear Creek.....	68	Fort Lewis School of Agriculture.....	626
Farmers' Club, Greeley.....	68	Fountain Valley canal.....	205
Farmers' Club Union.....	69	Francisco-Daigre farm.....	36
Farmers' convention.....	70	Francisco-Daigre ranch.....	66
Farmers' Club beet report.....	292	Frazier planted in 1867.....	501
Farmers' clubs, list of.....	71	Freighters turn out oxen.....	109
Farmers, not enough.....	311	Fremont at the Pueblo.....	20
Farmers' Equity Union.....	345	Fremont's journey up the Platte.....	16
Farmers' Equity officers.....	349	Fremont's second journey.....	18
Farmer-miner co-operation.....	346	Friars laid foundation.....	243
Farmers' Congress, the Colorado.....	349	Friars spiritual guides.....	241
Farmers' Congress organized.....	351	Fruit and Vegetable Growing, Development of, Chapter XII.....	501

	Page		Page
Fruit Growers, the United.....	331	Historian pro-Indian.....	93
Fruits and Vegetables.....	82	Hog cholera, conquering.....	565
Gardening gets impetus.....	187	Hogs driven across plains.....	438
Gauss (Robert) breeding experiments	267	Holden, pioneer dairyman.....	109
"Gentle" six-inch rain.....	253	Home economics research.....	580
Geographic influences.....	11	Homestead entries.....	61
German-Russian beet labor.....	406	Honey Producers, Colorado.....	336
Glover, an inspector.....	144	Horns are valuable.....	143
Gorge of the Gunnison.....	529	Hoover promotes factories.....	302
Government feeds Indians.....	93	Horses in demand.....	125
Government water rights.....	225	Horticultural products, value of....	519
Grain grown in 1839.....	16	Horticulture, research in.....	579
Grand Junction's first sugar run....	302	Horticultural show.....	514
Grand Valley apple boom.....	511	Horticultural statistics.....	514
Grand Valley project.....	540	Huerfano, dairying on the.....	48
Grange (See Colorado State Grange)		Huerfano, pork from the.....	47
Grange opposes "royalty".....	208	Iliff, cattle king.....	135
Grange, speaks on range question...	130	Iliff's operations.....	136
Grant's (President) recommendation	192	Immigration, Department of.....	476
Grape growing reviewed.....	517	Implements, ancient.....	174
Grass sustained game.....	107	Implements, types of.....	85
Grass worth thirty millions.....	141	Indian conditions serious.....	98
Grasses, character of.....	109	Indians harassed herds.....	112
Grasshoppers (See Locust)		Indians on meat diet.....	107
Grazing regulations.....	158	Indians refuse to farm.....	100
"Great American Desert" myth....	248	Indian Service corrupt.....	100
Great Divide, the.....	486	Indian warfare ends.....	102
Greeley's (Horace) prophecy.....	191	Innocent people suffer.....	91
Greenhorn, fort on the.....	21	International Dry Farming Congress	262
Greenhorn, Ruxton on the.....	25	Dry Farming Congress.....	268
Grower factory fails.....	306	many nations represented.....	268
Gunnison's Explorations.....	21	membership over 13,000.....	268
Gunnison tunnel construction.....	536	Burns (John T.) developed Con-	268
Gunnison tunnel, the.....	527	gress.....	268
Hahn's Peak Sabbath.....	88	world-wide program.....	269
Harper's Monthly article.....	200	Dr. Worst's address.....	269
Harriman sold water.....	196	constitution revised.....	270
Hartsel's Shorthorn drive.....	111	Institute, bulletin on.....	614
Hartsel's start with cattle.....	110	Institute, Fort Collins, Farmers'....	613
Hatch Act in 1887.....	541	Institute, Golden Farmers'.....	613
Hatcher farmed in '46.....	175	Institute, Longmont Farmers'.....	611
Hay, money in hauling.....	122	Institute, Loveland Farmers'.....	613
Hayden Report on Elliott tests.....	250	Inspection, method of.....	144
Hayden Survey on irrigation.....	195	Inspection voluntary.....	325
Hayes (President) approves range...	129	Intermediate credits.....	364
Hayes' (President) plea for Indians..	100	Interstate water rights.....	212
Headden's (Wm. P.) work reviewed	544	Isabel starts lettuce industry.....	521
Head's (Lafayette) ditch.....	178	Irrigation, beginning of.....	167
Head lettuce history.....	519	Irrigation by pumping.....	232
Held's (Philip) summer tillage tests	273	Irrigation, Colorado's rank.....	233
Held's results.....	274	Irrigation data, Year Book.....	233
Henderson makes discovery.....	108	Irrigation drew attention.....	200
Herd law, an early.....	121	Irrigation, future of (House).....	235
Herefords, Church's.....	160	Irrigable land estimated.....	179
Herefords exhibited 1869.....	161	Irrigation law, Elbert.....	193
Hermitage, the.....	49	Irrigation law, review of.....	220
Hicks Almanac as guide.....	261	Irrigation new to Americans.....	179
Hierarchies compared.....	243	Irrigation possibilities (Mead).....	209
High altitude gardens.....	519	Irrigation report by Hayden.....	195
High-line project.....	204	Irrigation research.....	572
High Order of Grunts.....	566	Irrigation studies.....	554
High schools teach agriculture.....	640	Irrigation, Utah's place in.....	183

Page	Page		
Irrigators, Mexican	22	Loveland factory starts, 1901.....	305
Irrigators, who were first.....	236	Lupton grew crops.....	24
Janis stakes claim.....	176	Lupton's Fort described.....	18
Janis, letter from.....	176	Mail via the Isthmus.....	92
Japs, Greeks and Indians.....	408	Market News service.....	479
Jaques, a Mexican leader.....	29	Markets, Director of.....	323
Jardine on the program.....	263	Markets, U. S. Office of.....	325
Jerky, how made.....	153	Marketing is studied.....	315
Julesburg is burned.....	96	Marketing laws, two.....	324
Kansas Pacific Railway tests.....	247	Marketing Associations.....	325
Kansas-Colorado opinion.....	218	Marketing vegetables co-operatively..	522
Kansas-Colorado suit.....	215	Maxwell Land Grant.....	282
Kelley serves.....	640	Magnes, first beet grower.....	282
Khammurabi, Code of.....	244	Magnes, brought seeds and trees....	283
Kroenig Ranch.....	47	Magnes orders mill.....	288
Lake City lively.....	89	Magnes anecdote.....	294
Lamb Day.....	473	Mavericking legalized.....	117
Land bank, farmers own.....	364	Maynard, Shorthorn breeder.....	160
Land banks, federal.....	362	Maynard, pioneer breeder.....	146
Land boom warning.....	84	Mead's first bulletin.....	209
Land banks, joint stock.....	365	Mead's historic address.....	210
Land claims, staking out.....	39	Mears (Otto) wins at Saguache.....	87
Land, getting foothold on.....	38	Mechanical Engineering research....	581
Land grants, Mexican.....	48	Meeker praises pioneers.....	69
Land office favored free range.....	129	Meeker tries to teach Utes.....	100
Land settlement, no policy.....	191	Meeker explains irrigation.....	197
La Porte-Colona settlement.....	177	Meeker prophesies.....	199
La Porte joins the ranks.....	634	Meeker brutally attacked.....	101
La Veta mill.....	31	Meeker is murdered.....	102
Lands estimated.....	62	Meeker's wife made captive.....	102
Lawlessness in spots.....	80	Meeker and Ouray.....	102
Laws, made their own.....	128	Meeker dogged by fate.....	102
Lee planted first orchard.....	501	Melbourne, the rain-fakir.....	261
Leonard (E. J.).....	361	Melon Day in 1878.....	469
Lettuce statistics.....	522	Melon industry.....	522
Literature that influenced.....	641	Mesa County Consolidations.....	631
Livestock depression.....	165	Mexican bean beetle.....	575
Livestock diseases.....	563	Mexican colonization, policy of....	239
Livestock exhibits, 1876.....	85	Mexican, Jaques a leader.....	29
Livestock legislation.....	121	Mexican grist mill.....	173
Livestock, railroad losses.....	121	Mexican land classification.....	239
Locusts, plague of.....	73	Mexican land grants.....	48
Log of perilous journey.....	530	Mexican mills described.....	31
Locust appropriation.....	73	Mexican, crops of the.....	30
Locusts come again.....	74	Mexicans kept stock.....	107
Locust plague, governors confer on..	76	Mexicans skillful irrigators.....	22
Locusts cover mountains.....	76	Mexicans supersede Europeans.....	406
Locusts frozen in snowbanks.....	76	Mill, first American.....	29
Locust appropriation.....	77	Mills, pioneer flour.....	31
Locusts (bird protection).....	77	Mills, Mexican described.....	31
Locust, bounty bill.....	77	Mill, Fremont county.....	31
Locust, price of scalps.....	77	Mill at La Veta.....	31
Locusts, Hayden Report on.....	77	Mill, first on the Fontaine.....	33
Locusts, devices for destroying.....	78	Mill, Conley's on Beaver Creek....	33
Locust Commission.....	78	Mill, Doughty's, Boulder.....	34
Longhorns from Spain.....	127	Mill at Saguache.....	87
Longhorns, a separate breed.....	127	Miller (T. L.) Hereford pioneer....	161
Longhorns vanish.....	143	Millions of acres available.....	275
Lory on first committee.....	629	Mining camp luxuries.....	89
Lory (C. A.) sums up marketing....	316	Mining camps, produce.....	51
Lotteries popular.....	80	Mining income balances imports....	314
Louisiana's bad example.....	81	Missions, history of.....	238

	Page		Page
Mitchell gives facts.....	300	Pioneer estimates confirmed.....	210
Modern irrigation.....	168	Pioneer flour mills.....	31
Moffat Tunnel.....	486	Pioneer life, cross section of.....	78
Mormons at the Pueblo.....	20	Pitkin's (Governor) message.....	99
Mormon claims.....	236	Plains conditions in 1890.....	255
Morton, experiments by.....	569	Plains sub-station.....	276
Mountain farmers visited.....	66	Platte, boat traffic.....	188
Mountain States Beet Growers.....	338	Platte-Arkansas canal scheme.....	195
Mush and milk diet.....	259	Platte, farms along the.....	63
Mutual fire insurance.....	365	Platte valley, a garden.....	17
Mutual insurance law.....	344	Platte valley in 1861.....	49
McAfee's 46-acre farm.....	186	Platte valley, locust swarms.....	75
McCoy originates plan.....	118	Platte valley resources.....	179
McClelland (J. S.) gives figures.....	311	Pooling not recent.....	320
McClelland orchard.....	503	Pork from the Huerfano.....	47
Namaqua stage station.....	177	Potato Co-operative Society.....	318
National Stock Growers' Assn.....	152	Potato Exchange officers.....	329
National Western Stock Show.....	162	Potato Growers' Exchange.....	326
Nebraska-Colorado water suit.....	223	Potatoes plentiful.....	186
Negro slave ordered.....	38	Potatoes:	
New Mexico irrigation.....	167	a God-send.....	418
Niter problem.....	544	brought by emigrants.....	418
Non-Partisan League.....	495	Parkinson first grower.....	419
North Fork beginnings.....	507	Neshannock popular variety.....	419
Northern Colorado orchards.....	512	astonished by size.....	420
Onions \$1.00 each.....	521	cheap in 1860.....	420
Onion production.....	518	exhibit in 1868.....	420
Orchards did not survive.....	256	Clark, the Potato King.....	421
Orchard, Lee planted first.....	501	Chicago fire fund auction.....	421
Orchards in Northern Colorado.....	512	sack brings \$270.....	421
Ouray a "white" Indian.....	103	Greeley starts growing.....	422
Ouray advises farming.....	104	Greeley's first growers.....	422
Ouray's letter to Elbert.....	104	Watson, develops markets.....	423
Ouray secures release.....	102	Texas market in '87.....	423
Ox teams on prairie grass.....	108	Grubb's book.....	424
Pabor's description.....	203	Potato "college" wanted.....	424
Pabor saw possibilities.....	505	early commercial growers.....	425
Pabor starts at Fruita.....	505	business men growers.....	425
Painter ranch.....	158	bulletin 175.....	426
Paonia's first orchard.....	507	production declines.....	426
Parsons:		price fluctuations.....	426
Parsons (E. R.) proved dry farming	271	growers are puzzled.....	426
started in South Africa.....	271	Fitch investigates.....	427
homesteaded in 1886.....	271	Stuart's Potato book.....	427
butter and egg income.....	272	western rotation described.....	427
dry land orchard.....	272	Sweet ranch described.....	428
cherry picking day.....	273	U. S. Experiment Station.....	428
alfalfa dry land.....	273	disease laboratory.....	430
Pastures, acquiring.....	128	San Luis valley.....	431
Payne first superintendent.....	561	Chisholm's prize acre.....	431
Payne (J. E.) tours plains.....	255	Brown Beauty variety.....	432
Peach Day.....	473	Divide district.....	433
Peaches first grown by Harlow.....	506	yield and acreage data.....	433
Pennock's unselfish service.....	504	Greeley Potato Day.....	470
Perrin, L. K.....	283	Powell's irrigation statement.....	217
Perrin's fine display.....	59	Poudre valley canals.....	203
Perrin beets before 1866.....	283	Prairie Cattle Co.....	137
Picnics, pioneer farmers'.....	89	Prairie dog eradication.....	575
Pike's Journal as evidence.....	216	President Wilson to the farmer.....	492
Pike's journey up the Arkansas.....	15	Produce sells high.....	51
Pioneers are maligned.....	93	Produce shipped in, in 1884.....	312

	Page		Page
Production, more efficient.....	314	Routt recommends federal aid.....	194
Production speeded up.....	492	Ruins teach lesson.....	168
Prophetic statement.....	156	Rural Life Association.....	355
Prowers, a cattle king.....	161	Rural school improvement.....	629
Prowers imports purebreds.....	123	Rural school survey.....	634
Prowers (J. W.) started 1862.....	122	Russian sunflowers.....	465
Pryor Brothers.....	140	Russian thistle.....	466
Pryor made money.....	142	Russian thistle as forage.....	467
Poisonous plants.....	563	Ruxton visits the Pueblo.....	20
Poudre basin storage.....	288	Sackett (Walter G.).....	549
Pueblo, at the (Fremont).....	20	Sage's (Rufus) travels.....	24
Pueblo flood.....	218	Salazar's testimony.....	28
Pueblo, Mormons at the.....	20	Salt Lake, flour from.....	185
Pueblo, Ruxton visits the.....	20	San Antonio de Bexar.....	242
Pumpkin Pie Day.....	471	Sand Creek fight.....	92
Purebred sires campaign.....	488	Sandsten's forecast.....	516
Purebred sires committee.....	123	Sandsten exposes seedless apple.....	512
Puritans at heart.....	80	San Luis Valley settlements.....	28
Purnell Act.....	543	San Luis Valley schools.....	636
Quarantine effective.....	144	San Luis Valley tests.....	570
Race meeting.....	59	St. Charles, ranches on the.....	66
Radio market news.....	479	Santa Fe Trail commerce.....	172
Raids and murders.....	95	St. Vrain hauls flour.....	174
Rail shipment of cattle.....	134	Sargent, rural school visitor.....	629
Railroad agricultural work.....	488	Schirmer, J. F. L.....	284
Railroad building urged.....	61	Schirmer's prophecy.....	284
Railroads bring a change.....	322	Schools, 187 consolidated.....	637
Rainbelt hallucinations.....	260	School conditions.....	634
Rainfall, a record.....	83	School of Agriculture, the.....	625
Rainmakers appear.....	260	Seed from Massachusetts.....	523
Rainmaker gets railroad aid.....	261	Seed testing work.....	578
Ranch and Range.....	485	Seedless apple promotion.....	512
Ranch 100 miles square.....	63	Seedless watermelon yarn.....	524
Ranches armed camps.....	91	Seepage or return waters.....	225
Ranchmen stampede herd.....	112	Settlers are rationed.....	74
Range cattle exhibition.....	162	Settlers given U. S. aid.....	251
Range cattle on forests.....	157	Settlers' side stated.....	95
Range industry deflation.....	165	Settlement started in seventies.....	247
Range is given up.....	254	Settlement, first permanent.....	27
Range Livestock Industry.....	107	Settlements on the Arkansas.....	19
Range, perpetual tenure.....	129	Settlements, San Luis Valley.....	28
Range stories fascinating.....	134	Settlements that vanished.....	22
Rangemen want vast domain.....	130	Seventeen factories operating.....	306
Reclamation Projects, U. S., Chapter XIII.....	527	Shaw (Alexander) replies to govern- ment.....	507
Religious zeal for dry farming.....	265	Sheep driven out.....	139
Renegade whites aid.....	92	Sheep, fattening of.....	150
Research and Experimentation, prac- tical application of, Chapter XIV.....	541	Sheep flock poisoned.....	148
Reservoir storage systems.....	227	Sheep, hit bottom.....	149
Return flow, value of.....	226	Sheep industry.....	146
Return waters benefit.....	224	Sheep of Spanish stock.....	147
Richardson describes settlements.....	173	Sheep shortage.....	123
Riddle (Agnes) exposes League.....	496	Sheep war.....	148
Rio Grande litigation.....	212	Sheepman vs. cattleman.....	147
Rio Grande suit lost.....	213	Sherman (General) foresees trouble.....	101
Riot over wild meat.....	153	Shorthorns, first exhibit.....	159
Rivers as guides.....	11	Sires in carlots.....	143
Rochdale system used.....	344	Small fruits.....	517
Rockafellow orchard.....	502	Smith-Hughes work.....	638
		Smith-Lever law.....	617
		Sod fort built.....	132

	Page		Page
Sod houses.....	257	Texas trail herds not wanted.....	111
Soil problems solved.....	559	Thrashing machine, first.....	50
Southwestern fruit section.....	513	Thrashing report made.....	50
Spain, irrigation in.....	170	Thomas' farming tours.....	63
Spanish-American labor.....	407	Tice states conclusions.....	96
Spanish colonists 1598.....	170	Tice visits plains region.....	248
Spanish irrigation.....	168	Tice describes experiments.....	249
Specialists enter field.....	618	Timber claims.....	256
Splenic fever.....	145	Tonnage figures exaggerated.....	286
Squawmen pick rich land.....	17	Trail, a government.....	140
State Agricultural College (see Colo- rado)		Trail herds, bought from.....	133
State appropriation, first.....	542	Trail herds under way.....	118
State Experiment Station.....	541	Transportation costs.....	61
State Fair encampment.....	624	Trapper settlement on Arkansas....	20
State fair, history of.....	475	Treachery had political source.....	94
State Grange (see Colo. State Grange)		Treaty settlement.....	223
State's greatest asset.....	307	Tree planting at Akron.....	562
State ownership of water.....	208	Tree planting discussion.....	68
State seed laboratory.....	578	Trees planted.....	249
Statistics on fruit growing.....	514	Trotting record lowered.....	59
Steers for feedlots.....	151	Uncompahgre Project figures.....	539
Stockgrowers first officers.....	120	Union colonists farmers.....	125
Stockgrowers organize.....	120	Union Colony sets pace.....	197
Stockgrowers split.....	155	United Fruit Growers, Assn.....	331
Stock Show 1905.....	162	Utah claims too broad.....	184
Stock Show officers.....	163	Utah irrigation.....	167
Stock Show organizes.....	163	Utah pioneered.....	266
Stock raising urged.....	255	Utah, prejudice against.....	184
Stockyards, forerunner of.....	122	Ute Agency irrigation.....	528
Stockyards, development of.....	163	Utes ambush Thornburg.....	101
Stratton's fruit report.....	503	Utes in the Southwest.....	89
Strawberry Day.....	474	Utes, trouble with the.....	99
Streams changed character.....	217	Utes were swindled.....	101
Stubbs makes prediction.....	55	U. S. Bureau of Animal Industry... 566	
Sub-stations established.....	542	U. S. Dept. "knocks" Colorado.....	506
Sugar Beet Production, Chapter VIII	281	U. S. Forest Service.....	156
Sugar bounty law.....	298	U. S. Market News service.....	479
Sugar making starts.....	299	U. S. reclamation urged.....	190
Sugar mill offered.....	287	Veterinary pathology.....	566
Sugar tariff favored.....	306	Veterinary research.....	563
Sunflowers for silage.....	465	Vegetable shipments heavy.....	518
Sweet (William E.) and Sapiro....	323	Von Richthofen's book.....	137
Swink imports beet seed.....	303	Wagon bosses' discovery.....	108
Swink informs Roosevelt.....	303	Wagon train arrivals.....	62
Swink starts melon growing.....	522	Wall, David K.....	180
Swindling the savages.....	91	Wall brings garden seeds.....	182
Taft touches the button.....	537	Wall grubstaked Gregory.....	181
Taos supplies Denver.....	174	Wall in California.....	181
Taylor's (Bayard) testimony.....	241	Wade (S. A.) pioneers at Paonia... 507	
Territorial period, end of.....	72	Wanamaker ditch.....	187
Terry Lake, first.....	228	War contracts.....	112
Texas bulls outlawed.....	121	Washington favored Indians.....	94
Texas cattle barred.....	111	Water, application of.....	198
Texas cattle disease carriers.....	117	Water, artesian.....	231
Texas cattle quarantine.....	144	Water believed unlimited.....	187
Texas cattle surplus.....	117	Waters belonging to Colorado.....	219
Texas cattle unbranded.....	117	Water, cost of.....	198
Texas drovers, plight of.....	116	Water decree, 1852.....	177
Texas, evidence from.....	242	Water, duty of.....	574
Texas fever.....	145	Water exchange, method of.....	229
		Water fight won.....	207

	Page		Page
Water rights of government.....	225	Wheat:	
Water, sale and rental.....	230	Turkey Red in Kansas.....	448
Weather records, no local.....	253	staple crop from beginning.....	449
Weed pest from Russia.....	466	statistics	449
Well on Eaton farm.....	233	price fixed.....	495
Weld County 27 consolidations.....	636	White River Agency sacked.....	102
Western Farm Life, the.....	485	Wild meat barbecue.....	152
Western Range Ass'n.....	155	Wilson (President) to the farmer...	492
Western Slope development.....	504	Windmill irrigation.....	256
Western Slope possibilities.....	205	Work oxen valuable.....	112
Wheat	446	Workmen in hourly peril.....	537
on St. Vrain.....	50	World War discussed.....	354
too much grown.....	312	Woman agent, first.....	618
urged to hold.....	319	Wool clip, 1877.....	134
Wheat Growers, Colo.....	333	Wreckage of caravans.....	254
of Spanish origin.....	446	Wyoming-Colorado Case.....	219
two heads in '59.....	447	Wyoming lottery fake.....	81
sowed wheat in 1860.....	447	Year Book, the Colorado.....	477
winter wheat urged in '61.....	448	Year Book on dry farming.....	275

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