The Flora of the Denver Mountain Parks

By Ellsworth Bethel

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The **State Historical and Natural History Society** was organized July, 1879, on the invitation of the General Assembly. The purpose of its organization, as provided by law, is to collect and preserve in a wide sense the history of Colorado and to collect and preserve scientific specimens and documents relating to Colorado.

The original act also provided that one of its purposes was to establish a State Museum. This purpose later became effective in the construction of the present building.

Because of the educational features of a large collection and the surrounding influences, it was declared "one of the Educational Institutions of the State of Colorado" by the legislature in 1915.

The Historical collections which are on exhibition are on the main floor of the State Museum. These have the finest collection of Cliff Dwellers relics in the world. The collections are rich in matters relating to the early history of Colorado. Many are shown in the room to the right. It has about two thousand bound volumes of Colorado newspapers dating from the earliest day. The Morgan Collection of books relating to Colorado is unique.

The Society is obtaining a record of men and women of Colorado and organizations effective in the war. It already has an official list of all men within the draft ages who entered service.

The Scientific collections and the Assembly Room are on the third floor. These collections are rich in Colorado plants, plant diseases and injurious plants. It has birds and other natural history specimens. These collections have been obtained by volunteers at their own expense, and eventually expected to become the property of the State.

Branch Unit societies will doubtless be authorized by the present legislature in each county of the State, with the same general purposes and with the immediate purpose of collecting and exhibiting matters relating to the recent war.

Membership in the Society is open to citizens "of character and standing in the State" who desire to help in the main purposes. The funds from a small entrance fee of $2.00 and an annual fee of $2.00 helps the Society to meet its general expenses.

The Flora of the Denver Mountain Parks

NEXT to our magnificent scenery, the chief attraction of our mountains lies in the beauty and profusion of our wild flowers. Their great abundance, variety, and gorgeous colors attract the attention and admiration of the tourist. The wide range of altitude in this state, 4,000 to 14,000 feet, gives a diversity of climate comparable to many degrees of latitude. This range gives a varied and extensive flora, which is exceeded by only one state in the Union—California. The aggregate is more than 3,000 species. On the highest summits we find an arctic-alpine flora, and certain species are those common to the far North within the Arctic circle. On the southern border of the state are representatives or allies of the Mexican flora. Botanists have classified the plants into zones according to habitation.

In ascending the mountains we find characteristic floras at different altitudes. For the most part, these plants are limited to a certain definite altitudinal range. Few plants of the plains reach into the mountains, and those of the lower mountains cannot withstand the rigors of the alpine summits. A trip from Denver to the high peaks, would to a certain extent, be similar to a trip northward through Canada and Alaska, so far as plant life is concerned, with this difference—that the flowers of our mountain

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This article was written by Mr. Bethel, the well known Botanist, and Honorary Educational Director and Curator of Natural History of the State Historical and Natural History Society at the State Museum. Through his own personal efforts in building up the State Herbarium, it has become one of the largest and most useful collections in the country.

*From the March number of Denver Municipal Facts by the courtesy of E. C. MacMechen, Editor.

tops would be found at sea-level in the Arctic zone.

More than 600 species of flowers are found within a mile or two of Denver. Those of the Mountain Parks considerably exceed this number, and for the most part are entirely different from those of the plains. The limits of this paper will permit a description of only a few of the more interesting kinds. Only those will be mentioned which may be seen in the foothills in an auto trip to Genessee Mountain. The present boundaries of the Mountain Parks lie within the foothills or submontane zone. Beyond the Park we have the montane, subalpine, and alpine zones. The flora of the higher altitudes is considered much more interesting than that of the foothills. When the auto road shall have been finished to the top of Mt. Evans, the trip will be one of transcendent interest, not only on account of the remarkably fine scenery, but because of the wonderful floral display of the high mountains. Timberline is a region of enchantment. The Elfinwood of stunted, gnarled and twisted trees is so wierd and fantastic that it seems like another world. The Arctic flora of forget-me-nots, phloxes, poppies, clovers, saxifrages and hundreds of other kinds only an inch or two in height, growing in dense matted groups, all with most brilliant colors, presents a sight never to be forgotten. But this wonderland must be left for another time.

Blue Columbine, the state flower of Colorado. Photo by F. J. Francis

Wild flowers are most beautiful in their natural surroundings. Their beauty is a composite of plant and environment. Nature's setting is essential to show their greatest charm. No flowers, however common, should be taken from our municipal parks. Leave them for others to enjoy and for reseeding so there will be no diminution in the following years. The tourist is likely to see only those near the highway, so these flowers should be left not only for his appreciation but for the enjoyment of all who take this interesting auto trip.

Notice the little girl in the picture. She loves flowers and does not destroy them. She leaves them for others who follow. A

beautiful child and beautiful flowers. What an exquisite picture of innocence and beauty. Contrast this picture with the other one—a young lady with an armful of columbines. These pictures illustrate the right and the wrong way of enjoying the beauties of our Mountain Parks.

The attitude towards these things is one of home training, and the training which may be given in the public schools. Lessons in plant and bird protection may well find a place in our educational programs.

The problem of protecting the native plants of our mountain parks is a serious one. Policing the park is not feasible. The people must be educated. Signs and warnings are helpful and there should be many more of them. Our Colorado Mountain Club is doing much to protect the beauties of the state. The following is one of their appeals:

> A GOOD WOODSMAN is a fellow you would want to go camping with—again. That kind of fellow always leaves his camp-site in better condition than he found it. He burns the rubbish, buries the cans, and puts out the fire, so that it **stays out.** No forest fire marks his trail. He uses a camera instead of a gun. All the wild creatures that crawl, fly or run, are his **friends** instead of his prey.
>
> He picks few flowers and never pulls them up by the roots. He never chops down a tree unless he has a mighty good reason for doing it.
>
> REMEMBER you were not the first over the trail. Leave the pleasant places along the way just as pleasant for those who follow you.

These placards and the work similar to that done by the many "Wild Flower Preservation Societies" of the East, is the best means of educating the public. But such appeals fail to reach a certain class who neither think nor care. This spirit of vandalism, and wanton destruction, is all too prevalent in this country. Miss Anne Evans has offered the suggestion that members of the Mountain Club and all people who tramp through our mountains, collect the seed of the columbine and other rare flowers, and

as they walk along scatter the seeds in new places. This is a valuable suggestion and if carried out would in a measure at least replace those which have been exterminated.

Mr. Enos Mills has done much to educate the people who visit Longs Peak Inn, and the beauties of this well known resort are as yet unmarred. Wild flowers should never be plucked up by the roots. Cut them off with shears or knife. A single blossom is more beautiful than an armful. Wild flowers wilt readily and serve poorly for a bouquet. Crushing ruins them.

The following notes on the columbine by Lloyd Shaw, are pertinent and apply equally well to most wild flowers:

> Crowded into a bouquet these blossoms lose most of their beauty. A few good blossoms arranged with meadow rue or fronds of fern are almost as beautiful as the wild blossoms growing on the mountain side, but these stifled bunches that we sometimes see jammed into a vase, only show the owner's selfishness in stealing so many of them, and expose the poor taste that can abide such an abomination of choked things.

It is not an easy task to write of our wild flowers for the reason that so few of them have as yet received common names. And further, these names are not uniform, that is, one kind may have several names, and again one species may be called by the same name as another species. Some people call every blue flower a blue-bell, and so harebells, blue flax, some pentstemons and many other kinds are all blue-bells to them. It would be better to limit this name to the Mertensias.

A board of nomenclature to select appropriate common names would be most desirable. Its function would be like that of the State Geographic Board, which selects names for the peaks and other topographic features, thus fixing a permanent nomenclature and eliminating duplications. There should not be a score of blue-bells any more

than there should be a score of bear mountains, sheep mountains, deer creeks, etc.

In less than a month a number of spring flowers will be seen in the foothills at Morrison and Golden. Already some have been seen. On January 28th, Mr. Brooks, of the Mountain Club, collected the Oregon grape in the foothills above Morrison. With the

The Mariposa lily, one of the showiest of mountain flowers. Photo by A. H. Haanstad

blooming of the maples and elms in the city, one will find the earliest spring flowers showing in the foothills. The chief flowers of this early coterie are the spring beauty, Oregon grape, wild candytuft, and Easter daisy. At the same time the aspens, willows, birches, and alders will display their catkins. If the weather continues warm these will be followed rapidly by other species such as the yellow violets, larkspur, sand lily, yellow peas, early locos and blue anemonies.

No flower attracts more attention than the blue columbine. It is the state flower selected by the school children by an overwhelming majority. It has also been approved by the state legislature as the state flower, though with such a bungling description that it has given the impression that some other flower was meant. Dr. Grosvenor, in his work on "Our State Flowers," states that Colorado has two state flowers, one adopted by the public schools and one by the legislature. Legislative enactment was intended merely to legalize the flower approved by the school children and not some white or lavender variant. Though this columbine is found in the mountains from Canada to Mexico, it reaches its highest development as to size, beauty and abundance in Colorado. Helen Hunt Jackson said that it was the gladdest flower she ever saw. It is undoubtedly the most beautiful and appropriate flower that could have been chosen as the state emblem. One will occasionally find a curious variant of this columbine in our municipal parks. It is a spurless variety called the Dailey's columbine, named by Miss Eastwood in honor of Miss Dailey, who discovered it. The petals are without spurs, and in shape, size and color, are the same as the blue sepals. The type specimen of this columbine may be seen in the exhibit cases at the State Mu-

seum, along with a beautiful painting of this flower by Miss Dailey.

Shaw's history of the derivation of the name may be of interest.

The blue anemone, beloved by everyone, is the harbinger of spring.
Photo by F. J. Francis

"Columbine is derived from columba, the dove. Pull off one of the petals and its two adjoining sepals, and you will behold a dove with expanded wings. Others tell us that if you look into the cup of the flower, you will see in the nectaries, the heads of five doves drinking from a central dish. Aquilegia coerulea the scientists have named it. They too, fancy a resemblance to a bird. But what a different bird do they see in the blossoms!

It is Aquila, the eagle, they see in those long spurs, the eagle of our high mountains, an eagle clothed in the cerulean blues of our sky."

The columbine, especially, needs protection. It is threatened with extinction. It has already been exterminated in the vicinity of many resorts, and may soon become so rare that tourists may not have an opportunity to see it.

The Geographic Magazine for June, 1917, published a beautifully illustrated article on "Our State Flowers." So many erroneous statements are given concerning the state flower of Colorado that it is deemed wise to correct them, especially since Arbor day will soon be here, when such data may be needed.

The blue columbine (Aquilegia coerulea) was adopted as the state flower by vote of the school children on Arbor day, 1891. The columbine received 14,472 votes out of 22,316, being nearly twice as many as was received by all others combined. The nearest competitors were the Mariposa lily, with 1,157 votes, and the cactus, 1,027 votes.

On April 4, 1899, the state legislature declared that the "white and lavender columbine" should be the state flower of Colorado. No description or scientific name was given in the law authorizing a state flower, and Dr. Grosvenor's interpretation that another species of columbine was intended is perfectly excusable.

It is hoped that this history of our state flower will settle this controversy and establish the fact that the state flower selected by the public schools and by the legislature are one and the same. The scientific name "coerulea" means blue, and blue columbine is the most appropriate name, though the sepals may often be purple, lavender, or even white, the latter color being quite common at high altitudes. The petals are always referred to as being white, but this

is true only for the cup-like part. The spurs of the petals are always of the same color as the sepals.

The Colorado blue spruce (Picea pungens) was adopted as the state tree by vote of the school children on Arbor day, April 15, 1892.

Another error in the article on our state flowers is the statement that the Oregon grape is an alternate host for the wheat rust, and the impression is given that it might be regarded as a dangerous plant when growing near wheat. The people of this state are being informed of the dangerous character of the common cultivated barberry, since it harbors the first stage of wheat rust. The laws compel its eradication in all states. The Oregon grape is immune to the attack of the wheat rust and is therefore harmless. It is, however, infested by two other rusts, but these are of no economic importance.

The blue anemone, beloved by everyone, is the harbinger of spring. What a pretty name, though difficult to pronounce, and many people object to it on this account. Anemone means wind flower. Wrapped in its warm coat of fur, it defies the late spring snows and the cruel March winds. Its flowers borne on leafless stalks open almost as soon as they appear above ground, but the stalks rapidly lengthen, and in fruit may be a foot or more in length. The stalk will build up cells in pure water and will lengthen considerably after being placed in a glass of water. Its silky plumose fruits are developed a month after flowering, and by this time the basal leaves have developed, and with leaves and fruit it presents a handsome appearance. When in fruit it is called Lion's Beard by those who fail to recognize its relation to the anemone.

It is the state flower of South Dakota, where it is known as the Pasque flower,

meaning Easter flower. This old English name may have been appropriate before the change in the Gregorian calendar, but it is no longer suitable. The scientific name of our blue anemone is not Anemone but Pul-

Some people call every blue flower a blue-bell, but this is the harebell.
Photo by F. J. Francis

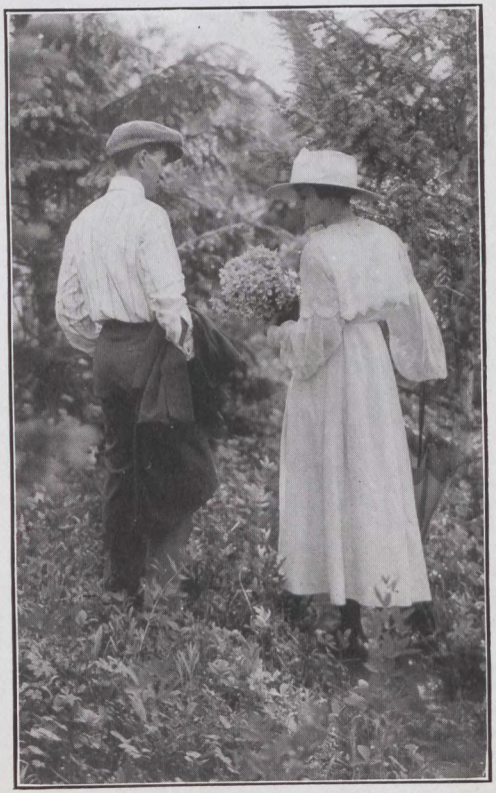
satilla, but this is not a very serious objection to the use of anemone as a common name. The common house geranium does not belong to the genus Geranium but to Pelargonium, but who would have the temerity to change this name which has become

endeared to us through long usage. The blue anemone extends eastward to Minnesota and Illinois, and northward to the the Mackenzie river. It has a different name in every locality, and there are more than a dozen names in common use. In Minnesota it is called Wild Crocus. In Colorado there are several other members of the genus Anemone, which bloom in the summer, and it is inappropriate to call them wind flowers. The rare and beautiful Anemone zephyra of the highest peaks may well be called the Arctic wind flower, as it extends northward to the Arctic circle. The blue anemone has no petals. It is only on the rich soil of cold northern slopes that we get the deep cerulean hue of the sepals. On sunny slopes it is purple, lavender, or even white, these being the usual colors when found farther east.

Bell anemone and bell clematis are the names applied to the purple Viorna. This unique flower grows in large clumps along the roadside for three miles beyond Lookout. It has large pendant bell-shaped flowers, which are either blue or purple. This near relative of the blue anemone has no petals, and the sepals are very thick and rigid, in this respect differing from the thin, papery sepals of most anemones. It has many finely dissected leaves, and the whole plant is covered with woolly hairs.

The purple virgin's bower, or purple clematis, is quite common in the forested slopes of Lookout. It is the only vine in the Mountain Parks. The many vines which grow along the streams on the plains, such as the white clematis, woodbine, wild grape. smilax, and wild cucumber, cease to grow beyond the base of the foothills. The Poison Ivy, which is a vine of the East, is a low shrub in Colorado, though sometimes it becomes a scrambler when growing among

rocks. It is not infrequently mistaken for the woodbine but may easily be distinguished by its three leaflets and yellowish or lead-colored hard fruits. The woodbine has five leaflets which are much smaller than those



This picture illustrates the wrong way of enjoying our Mountain Parks. Photo by K. P. Howe

of the ivy, and has bluish or purplish pulpy fruits.

The Mariposa lily is one of the showiest flowers of the mountains. Although it is found in the mountains from Montana to Arizona, it, like the columbine, attains its best development in the mountains of Colorado. It is extremely variable as to size and color markings. By many it is considered the handsomest flower of the state. Space will not permit an adequate description of this exquisite blossom. The scientific name is Calochortus Gunnisonii. The genus name means a beautiful plant, and the species is named in honor of Captain Gunnison, who discovered it in surveying a route for the Pacific railway in 1853. The Sego lily is a yellow variety of Mariposa lily and is the state flower of Utah. This species is very rare in Colorado and the herbarium at the State Museum has specimens from only three localities in the state, namely, Cimarron, Wolcott and Ridgway. The bulb of the Sego lily is used for food by the Utes and other Indian tribes of Utah.

The tiger lily, which is very rare, is also an attractive flower, but its close resemblance to those in cultivation causes it to receive less appreciation than it really deserves.

The scientific name of the sand lily, Leucocrinum montanum, means mountain lily, which is a misnomer, for it does not extend far into the mountains except in very rare cases, but frequents the plains and lower foothills. This is one of the gems of the lily family, and resembles somewhat the snowdrops of the garden. It very curiously ripens its seed under ground, and it has always been a mystery as to how these are distributed.

The spider lily is not a true lily, but this is a far more appropriate common name for the Tradescantia than spiderwort, Job's

tears, or widow's tears. This exquisite flower makes a pretty boquet and new blossoms will come out for several days after being placed in the vase.

The shooting star is one of our prettiest flowers and is a near relative of the cultivated Cyclamen. Its scientific name is Dodecatheon, meaning twelve gods. Its leaves form a rosette at the base. The few drooping flowers are borne on a long naked peduncle, the pink petals are reflexed upward, and the filaments unite to form a sharp beak. Children call this curious flower birds-bills, rooster-heads and Indian chiefs. All these names are appropriate but not so dignified nor pretty as the more common appellation, shooting stars. It belongs to the primrose family and has several alpine cousins which surpass it in beauty. In the estimation of many, the subalpine Parry primrose is the most beautiful flower of our mountain flora.

The following are the chief shrubs: Jamesia, thimble berry, salmon berry, Kinnikinnik, Oregon grape, mountain maple, dogwood, mountain mahogany, sumac, birch, alder, hazelnut, choke cherry, plum, currants, hawthorn, June berry and wild roses. The four most interesting species of the foregoing are Jamesia, thimble berry, Oregon grape and Kinnikinnik. Jamesia or Edwinia has no common name. It is the handsomest shrub of this region and is a near relative of the beautiful mock orange and Fendlera of Southern Colorado. It was named for Dr. Edwin James, an early botanist for whom James Peak was also named.

The large thimble berry blossoms somewhat resemble a white rose and, unlike the Jamesia, this shrub will readily stand transplanting. There are a number of specimens in Cheesman Park. They will be in bloom in early June and may easily be recognized by the delicious odor. The fruit is disap-

pointing, as it consists almost entirely of seeds. The salmon berry is often called thimble berry; it is a much smaller shrub, with very large leaves, and a large pulpy edible fruit of a salmon color.

This little girl loves flowers. She leaves them for others who follow. Photo by K. P. Howe

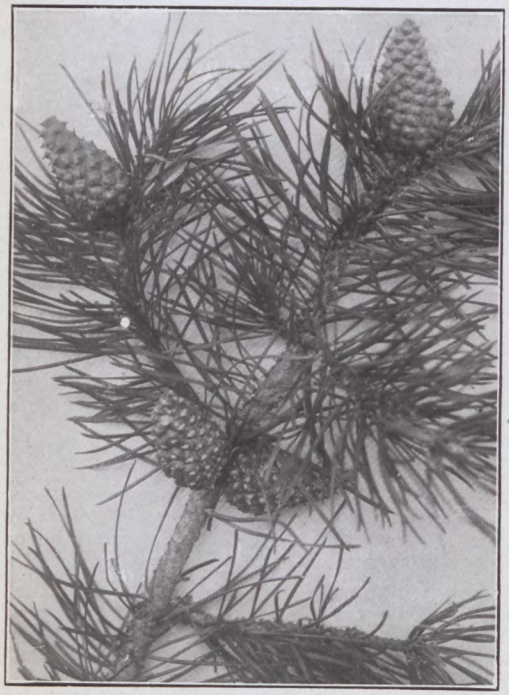
In many places the Kinnikinnik, a little trailing evergreen shrub, makes a dense covering for the hillsides, which would otherwise be bare. Though this humble plant bears many names, the Indian name, meaning "mixture," is most apropos. Mixed with dogwood leaves, it was used by the Indians as a substitute for tobacco. Sometimes tobacco comprised a part of the mixture, but more often, like some of the modern cigars, was without it. It has delicate pinkish-white, urn-shaped flowers in the spring, and bright red berries in the winter. In some parts of the country it is collected extensively for Christmas decorations. It is one of the most useful plants, since it helps to retain the soil, which would otherwise soon be washed away by heavy rains.

The Oregon grape is the state flower of Oregon. It is a low shrub with evergreen leaves and resembles a dwarf holly. It has interesting yellow flowers, and blue grape-like fruit which makes a delicious jelly. The roots are used medicinally to allay fevers.

The deciduous or broad-leaved trees of the park are so well known as to need no description. Cottonwoods and boxelders occur along the streams and aspens are scattered everywhere. The light green of the aspen leaves as they flutter in the breeze contrast beautifully with the dark green leaves of the Douglas fir, and in the autumn take on most gorgeous colors. Its scientific name is Populus tremuloides—the trembling poplar, or quaking aspen. It has recently been given the name Populus aurea, the golden aspen. This latter name is hardly tenable, since our western aspen differs from those of the East only in the brilliant autumn coloration.

To many people all evergreen trees are pines. A little study, however, will enable one to differentiate the cone-bearers as easily as the broad-leaved trees. The two

pines of the parks are the lodgepole pine and the rock pine, or western yellow pine. The latter is the large pine, and scattered trees grow everywhere. It forms the forest on the top of Lookout and at Bergen Park. The lodgepole pine is a smaller tree and



Lodgepole pine. The Indians used it for tepee poles. Photo by the author

there is a small forest of this species on the northern slope of Genessee mountain, and one on the Idaho Springs road, beginning

at the Genessee cut-off. Its use by the Indians for tepee poles accounts for its name. It is very unusual to find this pine in the foothills. Its habitat is that of the montane zone, where it forms extensive forests.

The Douglas fir, or Douglas spruce, is the most common evergreen and occurs in all the draws and north exposures. Unlike the pines, which bear their leaves or needles in bundles, the Douglas fir has single leaves which are soft and flat and of a rich green color. Its cones, with long projecting comb-like bracts, add interest to this handsome evergreen.

Scattering trees of the Rocky Mountain juniper or cedar may be seen on the otherwise treeless hills, and the little trailing juniper is not uncommon in the forests. In Bear Creek canon there will be seen some good specimens of the Colorado blue spruce, the state tree of Colorado. Above Evergreen this spruce is supplanted by the valuable Englemann spruce.

There are some rare flowers in our Mountain Parks, but those who know the secret of their hiding place will not reveal it, and they are wise in this, for if known, these rarities would soon be exterminated. The orchid family is well represented, but most of them are very rare and hard to find. They are: the golden ladies' slipper, the Venus' slipper orchid, the long bracted orchid, the delicate little Calypso, twayblade and rattlesnake plantain. Ladies' tresses and habenarias are more abundant, but occur in mountain meadows and along streams in the montane zone. The curious coral-root orchid is not uncommon in the pine woods, and is usually associated with the equally peculiar pine-drops of the Indian-pipe family. Both of these feed on humus and are devoid of functional leaves, and green coloring matter (chlorophyll).

The cancer-root or broom-rape is another odd plant in which the green color is absent. It is a parasite on the roots of various plants, particularly the mountain sage. There are some other parasites, but these have green leaves. Both the bastard toad-flax (Comandra) and all of the paint brushes or Indian pinks (Castilleja) are partly parasitic on roots of other plants, hence cannot be transplanted to our gardens. There are several mistletoes parasitic on the evergreens; those of this region have no beauty to commend them, and the one which is so common on the yellow pine is a serious pest, and has killed many fine trees in the park. However, it is not so pernicious as the pine bark beetle, which is found at Troutdale and beyond Genessee mountain. Remedial steps must soon be taken to combat these pests or the beauties of the parks will be greatly marred.

Weeds are unsightly anywhere and particularly so when growing among our native wild flowers. Where possible, they should be eradicated from the park. It seems odd that these ubiquitous pests should find congenial abodes where the soil and climatic conditions which prevail in our mountains would seem to be prohibitive. The large, unsightly mullein is spreading rapidly on the west slope of Genessee mountain, and the less objectionable field penny-cress is all too common along the roadside. The common dandelion, which should not be confused with our pretty native species, thrives well at ten thousand feet altitude. This irrepressible pest of lawns would be considered pretty if it were rare. Beecher calls them "golden kisses on the landscape." In Denver this might well be paraphrased to "golden curses on the lawn." The Russian thistle, Kochia, and hedge mustard have crowded out many wild flowers in Denver, and a

like fate may befall the flowers of the roadside in our mountain parks.

Space will not permit a discussion of hundreds of other flowers, each of which is deserving of a detailed description. The following short list includes some of the more interesting species: Gilias, phlox, pentstemons, harebell, blue flag, yucca, star lilies, larkspur, aconite, lupines, sweet peas,

The cones and single needles of the Douglas fir, the most common evergreen in the parks
Photo by the author

vetch, locos, flax, geraniums, evening primroses, evening star, mertensias, gentians, bergamot, paint brushes, bed straw, golden rod, sunflowers, Gaillardia, coneflower, sulphur flowers, etc., etc.

It is hoped that the time will come when space will be available in the museum for a display of fresh flowers during the summer months, as is done in many of the large museums of the country. These exhibits in Boston, San Francisco and elsewhere, have been the most attractive feature in their museums. Requests are constantly received for such an exhibit as was shown here during the meeting of the National Educational Association.

It is hoped that this hastily prepared article will awaken an interest in our wonderful flora. Learn the names of our wild flowers. The name is an introduction and you will want to know more about them. Bring them to the museum and our curators will gladly help you.

In closing may we summarize briefly. It is a pity to dismiss these beautiful flowers with such brief descriptions. Many of them are deserving of an apostrophe or an ode. Our wonderful flora is unknown and unappreciated. What a blessing it would be if this state could have helpful nature manuals. Nature study is essential in all public school curricula. To popularize science is the great function of public museums. The people want to know, and they have a right to know the common things about them which enter into their everyday lives and not the least of these are our beautiful wild flowers, which, in the language of Henry Ward Beecher, "are the sweetest things God ever made and forgot to put a soul into."

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