

STATE OF COLORADO



BUREAU OF MINES

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*Circular No. 2*

# The MINERALS of COLORADO and AREA LOCATIONS

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The following list of minerals and their approximate location in Colorado has been prepared to satisfy the many requests for this type of information received each year by the Bureau of Mines.

With new finds, discoveries, and identifications being made from Colorado's vast storehouse of minerals each year, it is impossible to say that this list is complete. It will provide a general guide to the location and type of Colorado's mineral wealth. Every effort has been made to check the accuracy of these listings, but no doubt many of the listed minerals occur in areas and districts not mentioned or yet identified.

Further information on these minerals will, by necessity, be determined by personal research and exploration. The Bureau of Mines does not intend to convey an estimate of the size and worth of the deposits listed.

# THE MINERALS OF COLORADO

and

## AREA LOCATIONS

- ACANTHITE. Clear Creek County: small quantity with other silver ores; Dolores County: Enterprise Mine, Rico
- AGATE. Fremont County: mined at Garden Park, seven miles north of Canon City, and at Curio Hill, six and one half miles south of Canon City; occurs at other places
- AIKINITE. La Plata and Montezuma Counties: in the La Plata Mountains, reported in fair quantities
- ALABANDITE (manganese sulphide). Park County: Quartzville; Summit County: Queen of the West Mine, argentiferous with rhodochrosite
- ALTAITE. Paradox Valley and Colorado Plateau: wood replacement in sandstone
- ALLANITE. Boulder County: near Boulder in flattish tabular crystals in gneisses and granites; Douglas County: at Devil's Head
- ALMANDITE. See Garnet
- ALTAITE (telluride of lead). Boulder County: in several mines in Gold Hill District, argentiferous and auriferous has been mined
- ALUMINUM. See Bauxite and Cryolite
- ALUNITE. Conejos County: Platoro and other places; Custer County: Knickerbocker Hill and Rosita Hills; Hinsdale and Mineral Counties: various localities in the San Cristobal Quadrangle; Lake County: Leadville; Ouray County: National Bell Mine and Red Mountain; Rio Grande County: Summitville, Jasper, Embargo, Summer Coon, and other places; Saguache County: on Tracey Creek, Bonanza, Beidell and other places
- AMALGAM (natural). Boulder County: several mines; La Plata County: Neglected Mine, fifteen miles from Durango
- AMAZONSTONE. Douglas County: Devil's Head Mountain; El Paso County: Pikes Peak region and Crystal Park near Manitou Springs; Teller County: four miles north of Florissant, at many places around Crystal Peak

AMBER. Boulder County: in the Boulder coal field and adjoining counties

AMBLYGONITE. Fremont County: the variety known as namiblygonite, because of the soda present, is mined and shipped near Canon City; Gunnison County: near Parlin

AMETHYST. Has been mined at the following localities: Fremont County: twelve miles northwest of Canon City, one mile south of Twelvemile Park; Gilpin County: Nevada; Gunnison County: Elk Mountain; Hinsdale County: Henson Creek; Las Animas County: Animas Range; Mineral County: at Amethyst, near Creede, and head of Piedra River; Saguache County: Carners Creek

ANHYDRITE. Eagle County: two miles north of Gypsum

ANGLESITE (lead sulphate). Chaffee County: Monarch and Garfield area; Clear Creek County: Georgetown Mines; Fremont County: occurs in croppings of Sedalia Mine; Hinsdale County: near Lake City; Lake County: silver mines at Leadville; Ouray County: Red Mountain; Summit County: Breckenridge; occurs also in many other places

ANNABERGITE. Custer County: Gem and other mines near Silver Cliff

ANTHRACITE. See Coal (anthracite)

ANTIMONY. See Bournonite, Polybasite and Stibnite

APATITE. Eagle County: near Gypsum in the dark andesites of Cripple Creek; Gunnison County: at the Iron Hill area southwest of Powderhorn

AQUAMARINE. Chaffee County: Mount Antero; Clear Creek County: near Georgetown; Fremont County: reported from vicinity of Royal Gorge, five miles northwest of Canon City; Jefferson County: near Creswell; Park County: Buffalo Mountain

ARGENTITE (silver glance). Clear Creek County: Silver Plume and Georgetown Mines; Dolores County: Newton Hill Mine, Rico District; Hinsdale County: near Lake City; silver-lead mines at Leadville; Montrose County: Cashin Mine; San Miguel County: Marshall Creek in quartz veins with tetrahedrite, galena, sphalerite and some silver; Summit County: Montezuma District; occurs in many other mines in small quantity all through the Sulphide Belt

ARSENIC. Found in complex ores in San Juan area, Red Mountain

ARSENOPYRITE (mispickel). Gilpin County: of rare occurrence, some of it highly argentiferous but of no great economic value; auriferous; Central City and elsewhere; Gunnison County:

- near Ruby Camp with proustite, argentiferous; San Juan County: Silverton; San Miguel County: Mount Wilson, argentiferous with tetrahedrite and at Telluride
- ASBESTOS.** Boulder County: Allenspark, Mont Alto Park and other places; Chaffee County: near Maysville; Fremont County: occurs in Sedalia Mine; Rio Grande County: near Jasper
- ASPHALT.** Asphaltic rock occurs in Garfield, Rio Blanco, Routt and other western counties and in Middle Park; small deposits occur elsewhere as near Morrison
- AURICHALCITE.** In oxidized zinc ore of Little Johnny and neighboring claims, Leadville
- AUTUNITE.** Gunnison, Jefferson, Larimer and Saguache Counties
- AZURITE** (blue carbonate of copper). Fremont County: occurs in Red Gulch copper district; Routt County: Hahns Peak, prospected; San Juan County: occurs in ore bodies of Bear Creek
- BARITE.** Boulder County: many places in mining area; also vein of considerable size near Boulder; Mineral County: at the Wagon Wheel Gap Fluorite Mine; Pitkin County: gangue mineral of Aspen District; San Miguel County: occurs two miles north of Placerville in veins two to seven feet wide
- BAUXITE.** Chaffee County: reported near Buena Vista
- BEEGERITE.** Ouray and Park Counties: in several mines; Old Lout Mine near Ouray, mined for silver
- BENTONITE.** Bent, Custer, Gunnison, Mineral, Weld, and Logan Counties: generally small deposits of medium quality in horizontal beds
- BERYL.** Boulder County: near Glendale; Chaffee County: occurs near top of Mount Antero; color varies from light blue to deep aquamarine green; fine gems, worked intermittently; Clear Creek County: Georgetown; Fremont County: East Gulch, six and one half miles north of Texas Creek; mined, few gems cut; Jefferson County: near Creswell; Park County: east of Wilkerson Pass, Buffalo Mountain; Larimer County: Crystal Mountain
- BISMUTH.** See Beegerite, Bismuthinite, Bismutite, Cosalite and Tetradymite
- BISMUTHINITE** (bismuth sulphide). Boulder County: several mines; Chaffee County: at Granite; Grand County: at Cummins City, North Park; Jefferson County: Guy Hill; Lake County: Leadville District, Highland Mary and other mines; La Plata County: California District; Comstock Mine; Larimer County: Big Thompson River; Ouray County: Red Mountain District, Indiana Mine

**BISMUTITE.** Boulder County: reported in mines; Chaffee County: Mount Antero; La Plata and Montezuma Counties: reported in La Plata Mountains; Red Mountain area, San Juan Triangle

**BITUMINOUS ROCK.** Grand County: Middle Park

**BORNITE** (peacock ore). Larimer County: at Pearl; Moffat County: with vanadium deposits on Blue Mountain; Montrose County: in ore deposits of Cashin Mine; Pitkin County: occasionally found in Aspen District; small quantities of ore found in many other places

**BOURNONITE.** San Juan County: particularly in the Silverton area

**BROCHANTITE.** Chaffee County: was mined in Monarch Mine

**BROWN IRON ORE** (Limonite, brown hematite). Mined for flux, also for silver; Fremont County: Sedalia Mine; Gunnison County: occurs in irregular masses along Tomichi Creek, Whitepine District; Hinsdale County: occurs near Lake City; Lake County: mined in silver-lead mines at Leadville, mostly manganese; Pitkin County: common in Aspen District mines; Saguache County: large body interbedded with limestone at Orient; was extensively worked, still producing few thousand tons annually; Summit County: has been mined for flux; occurs in thousands of vein cappings

**CADMIUM.** See Greenockite

**CALAMINE.** In ore bodies at Leadville and Monarch, and in other silver-lead districts

**CALAVERITE.** Boulder County: several mines; Teller County: mined in Cripple Creek District at Raven Mine, Prince Albert Mine and C. O. D. Mines; principal gold mineral of Cripple Creek mines

**CALCIOVOLBORTHITE.** Montrose, Mesa and San Miguel Counties: found in crevices in sandstone; see also Volborthite, Colorado Plateau

**CARNOTITE.** Dolores County: reported from points along Rio Dolores; Eagle County: in silver, copper and vanadium-bearing sandstone on Brush Creek; Garfield County; Moffat County: Blue Mountain near Skull Creek, fifteen miles north of Rangely; Rio Blanco County; Mesa County: as an impregnation in sandstone along the Rio Dolores, forty miles southwest of Gateway; Montrose County: as an impregnation in sandstone along Roc, La Sal and Paradox Creeks and in other places; Rio Blanco County: prospects near Coal Creek, fourteen miles northeast of Meeker; Routt and other western counties; San Miguel County: near Cedar, along Disappointment Creek and in adjacent territory, near Placerville; in small quantity with roscoelite; common on Colorado Plateau

CASSITERITE. Garfield County : near Carbondale ; Lake County : Climax Mine

CELESTITE. El Paso County : at Glen Eyrie near Manitou Springs

CEMENT MATERIAL (Portland). Boulder County ; Fremont County : Mississippian and Cretaceous limestone west and east of Front Range, suitable for Portland cement ; cement plants at Portland and Concrete, east of Florence ; limestone of Niobrara age used ; Larimer County : Niobrara limestone from La Porte to point eight miles west of Longmont ; Boulder County : suitable for Portland cement ; only very narrow band, ten to twenty feet in width in Niobrara at this point, widens southward into Boulder County ; good limestone occurs at several points in rocks of Pennsylvanian age east of range and in carboniferous rocks in Chaffee, Gunnison and other counties west of range (See also Limestone)

CERARGYRITE (horn silver). Custer County : Illinois Mine, Schanek Hill near Silver Cliff ; Eagle County : a silver mineral reported to be cerargyrite occurs in vanadiferous sandstone on Brush Creek ; Lake County : common in oxidized ores of silver-lead mines at Leadville ; Summit County : occurs near Breckenridge in small quantities impregnating a rhyolitic rock ; Ouray County : in Paquin District

CERIUM METALS. See Allanite, Gadolinite and Monazite

CERUSSITE (lead carbonate). Clear Creek County : Georgetown area produced considerable quantity ; Custer County : has been extensively mined at Silver Cliff ; Fremont County : small quantity in Sedalia Mine ; Hinsdale County : occurs near Lake City ; Lake County : mined in silver-lead mines at Leadville ; Pitkin County : principal ore of upper zones of Aspen District ; Routt County : Hahns Peak region, Tom Thumb Mine only producer ; occurs also with galena ores of Chaffee, Eagle, Summit, Dolores and other counties

CHALCANTHITE (bluestone, blue vitrol). Clear Creek County ; in adjacent parts of Summit County : in considerable quantities in veins with tetrahedrite, galena, chalcopyrite, sphalerite, barite, etc. ; San Juan County : Silver Pick and Special Mines

CHALCEDONY. Grand County : Willow and Corral Creeks, near old salt works, South Park ; Park County : Thirty-One Mile Mountain, west of Guffey, blue chalcedony ; occurs also at several localities in surface gravels of Gunnison, Logan, Morgan, Ouray, Rio Grande, Saguache and Weld Counties

**CHALCOCITE** (copper glance). Clear Creek County: near Idaho Springs; Chaffee County: near Poncha Springs; Fremont County: Gem Mine; Larimer County: occurs at Pearl; Montrose County: rich ore at Cashin Mine, La Sal Creek carries silver; Ouray County: has been mined at Iron-ton, argentiferous, massive; Routt County: seen at a few places; San Miguel County: occurs with siderite and small crystals of sphalerite, argentiferous; also in sandstone with matrix of calcite (argentiferous; common at other mines)

**CHALCOPHANITE**. Associated with hetaerolite in oxidized zinc ores of Leadville

**CHALCOPYRITE** (copper pyrites). Found in small quantities in nearby camp in Sulphide Belt; Clear Creek County: mines northwest of Idaho Springs; carries gold and silver; Dolores County: not abundant in Rico District, small amount in Newman, Silver Swan and other mines; Gilpin County: occurs with uranium in Wood, Kirk, Belcher and German Mines near Central City; Gunnison County: Blistered Horn, Tincup District, Sandy Hook and Gold Links, Gold Brick District, Vulcan and elsewhere, carries gold and silver; Hinsdale County: near Lake City; Larimer County: occurs at Pearl; Pitkin County: Aspen District; Routt County: occurs at Hahns Peak; San Juan County: Monticello Lode, Silverton District carries gold, also in Bear Creek District, carries gold and silver; Summit County: in veins of Montezuma District; Ouray County: Red Mountain District; common in other places

**CHALK**. In the eastern part of the State in cretaceous limestone formations

**CHRYSOBERYL**. Six miles west of Sedalia, at old mica prospect, with black tourmaline, muscovite and near large gournets; seems to be only locality west of Greenfield, New York

**CHRYSOCOLLA** (silicate of copper). Custer and Saguache Counties; Sangre de Cristo Mountains, undeveloped; Jefferson County: Pine Grove and Bear Creek; Lake County: Leadville

**CINNABAR**. Boulder, Clear Creek and other counties: in small quantity at several points; La Plata County: in sandstone; said to be rich, undeveloped; several small finds in southern part of State, near Gateway

**CLAY** (brick). Dug at the following places; Boulder County: Boulder, Trilby; Conejos County: Alamosa; Denver County: Argo and Denver; Douglas County: Parker; El Paso County: Colorado City, Colorado Springs and Suburbs Springs; Fremont County: Canon City and Florence; Garfield County: Glenwood Springs and Rifle; Hinsdale County: Lake City; Jefferson County: Golden and Hall; Kit Carson County: Burlington; La Plata County: Bell Spur, La Plata; Larimer County: Ft. Collins and Fossil Creek; Las Animas County: Trini-



dad; Mesa County: Grand Junction; Moffat County: Craig; Montrose County: Montrose; Morgan County: Brush and Fort Morgan; Otero County: La Junta and Fowler; Prowers County: Lamar; Pueblo County: Pueblo; Rio Grande County: Monte Vista; Teller County: Cripple Creek; Weld County: Greeley; Yuma County: Wray and Yuma

CLAY (fire). Douglas County: Larkspur; El Paso County: Colorado City and De Witt Ranch, four miles from Colorado Springs; Fremont County: Canon City; Garfield County: plastic clay from Dakota sandstone near Glenwood Springs has been mixed with crushed quartz and made into bricks for coke ovens at Cardiff; Jefferson County: Golden; Lake County: Leadville; Pueblo County: Pueblo and Stone City

CLAY (kaolin). Occurs in thousands of mines as gouge, as at Durango Girl Mine, on east slope of Lewis Mountain; La Plata County: deposits near Newcastle, Parkdale, Salida, Silver Cliff and elsewhere; Ouray and San Juan Counties: Red Mountain areas; quality and extent are not known

CLAY (stoneware). Jefferson County: Golden; burns white, red and buff; Pueblo, El Paso, Douglas and Larimer Counties

CLAY (zinc-bearing). Associated with oxidized zinc ores of Leadville

COAL (anthracite). Gunnison County: mined at Crested Butte; coal-bearing area is about twenty-five square miles; Pitkin County: has been mined at Crystal City; Routt County: Yampa coal field; small local areas of good coal not mined yet

COAL (bituminous and subbituminous). Book Cliffs, Canon City, Durango, Grand Hogback, Grand Mesa, Raton and South Platte are the principal coal fields. The principal producers are: Las Animas, Huerfano, Boulder, Fremont, Gunnison, El Paso, Weld and Routt Counties

Book Cliffs Field, Garfield, Rio Blanco and Mesa Counties: there are about 360 square miles of workable, medium-grade bituminous coal; the four important mines are: Cameo (8-foot bed), Palisade (6-foot bed), and Book Cliffs (7-foot bed) in Mesa County and Carbonera (7-foot bed) in Garfield County

Canon City Field, Fremont County: there are about 22,400 acres of high-grade non-coking bituminous coal; the average thickness of beds is three to six feet; mining for domestic trade is extensive

Colorado Springs Field, El Paso County: a good quality of subbituminous coal occurs in three beds, one to two feet thick

Danforth Hills Field, Rio Blanco and Routt Counties: the workable coal in ten beds has a minimum thickness of seventy-three feet; there are about 159,700 acres of workable noncoking bituminous coal; mined for local use

## COAL (Continued)

Durango Field, La Plata and Archuleta Counties: there are three beds, three, four and six feet thick of excellent coking bituminous coal, all of which are mined; there are also several workable beds of bituminous coal

Glenwood Springs Field, Garfield and Pitkin Counties: there are nine beds mined, having a total thickness of ninety-six feet; the coal is a good grade of bituminous, non-coking in Garfield County but coking in Pitkin County

Grand Hogback Field, Rio Blanco and Garfield Counties: there are about 41,720 acres of workable coal land; the seven beds mined have a total thickness of 105 to 108 feet; the coal is non-coking bituminous; mining is rather extensive

Grand Mesa Field, Gunnison, Delta and Mesa Counties: there are about 550 square miles of workable bituminous coal, some of which is of coking quality; the field is divided into the Palisades District containing eleven feet of workable coal beds; the Rollins District containing fifteen feet of workable coal beds and the Somerset District containing sixty-five feet of workable coal beds; of these the Somerset is the most important, producing most of the coal shipped

Lower White River Field, Rio Blanco, Routt and Moffat Counties: a good grade of bituminous coal is mined in small quantities for local use

North Park Field, Jackson County: there are about 75,000 acres of possible subbituminous coal land; the two beds mined have average thickness of ten feet and fifty feet; one mine is shipping coal and six are mining for local use

Raton Mesa (Trinidad) Field, Las Animas and Huerfano Counties: About 1,115 square miles of high-grade bituminous coal; there are three series of beds, of which the lower is the most important; average thickness of beds is six feet; coal in the southern part of the area is largely consumed in the manufacture of coke; it is the most important coal field in Colorado, producing sixty-two percent of the total annual tonnage

South Park Field, Park County: there are three beds, five, six and eight feet in thickness which were formerly mined; the mines have all been abandoned

South Platte Field, (including Denver Basin and Boulder District): this field extends from the region south of Denver nearly to the Wyoming line, covering parts of Douglas, Elbert, Arapahoe, Jefferson, Adams, Morgan and Weld Counties: the coal is subbituminous grade; mining is extensive in Boulder County; beds mined range from two to fifteen feet in thickness

Yampa Field, Routt County: workable coal area is estimated at 1,200 square miles of bituminous coal; the northern part of the field contains many thick beds of subbituminous grade; the coal is mined for local use at Craig, Hayden, Pool and Eddy

COBALT. See Erythrite and Smaltite

COLORADOITE. Boulder County: Keystone, Mountain Lion and Smuggler Mines with quartz, gold, native tellurium and sylvanite

COLUMBITE. Fremont County: near Canon City; Jefferson County: Turkey Creek; Teller County: several points in Pikes Peak region

COPPER (native). Dolores County: California prospect near head of Iron Draw; Jefferson County: near Golden; Montrose County: mined and shipped from Cashin Mine; Park County: Handcart Gulch; Routt County: veins near Columbine, Hahns Peak region; occurs also at other places

COPPER MINERALS. Copper is a predominant metal produced in the following districts: Chaffee County: Cleora and Sedalia; Fremont County: Canon City, Cotopaxi, Red Gulch; Grand County: Harmon; Huerfano County: Huerfano (malachite); Jackson County: Pearl; Jefferson County: Evergreen; Larimer County: Empire and Steamboat Rock; Mesa County: Unaweep; Montrose County: La Sal; Ouray County: Red Mountain; Routt County: Copper Ridge, Elkhorn, Oak Creek, Rock Creek, Spring Creek; San Juan area; Teller County: East Beaver, eight miles south of Rosemont; of minor importance in many other districts; see also Azurite, Bornite, Brochantite, Chalcocite, Chalcopyrite, Chrysocolla, Covellite, Cuprite, Enargite, Malachite, Melaconite, Stromeayerite, Tennantite and Tetrahedrite

CORDIERITE. Fremont County: found six miles from Canon City

CORUNDUM. Chaffee County: occurs in crystals at Calumet; Clear Creek County: occurs in Saxon Mountain near Georgetown; Routt County: near Hahns Peak, bluish

COSALITE. La Plata County: several mines, including Comstock Mine near Parrot City; Ouray County: Gladiator and other mines

COVELLITE. Montrose County: rich ore at Cashin Mine, La Sal Creek carries silver; Rio Grande County: Summitville; San Juan County: several small finds

CRYOLITE. El Paso County: occurs at St. Peter's Dome, Pikes Peak District

CUPRITE. Chaffee County: near Poncha Springs, mined at Lily Mine near Garfield; Fremont County: Sedalia Mine; Jefferson County: Bear Creek and Pine Grove; Montrose County: occurs in ores of Cashin Mine, La Sal Creek; Pitkin County: in oxidized ores of Aspen District; mined also in many other places

- DIATOMACEOUS EARTH. Denver County: small bed at West Denver, not mined
- DOLOMITE. Dolomitic limestones of Silurian and Carboniferous age are country rocks of ore bodies at several mining districts
- EMBOLITE. (chlorobromide of silver). Lake County: near Leadville; of common occurrence chiefly in siliceous iron ore in cavities and on fissure planes
- EMPRESSITE. Saguache County: Empress Josephine Mine, Bonanza District, associated with galena and native tellurim
- ENARGITE. Clear Creek County: small quantities occur; Gilpin County: has been mined at Russell Gulch, particularly at Powers Mine, argentiferous with pyrite and fluorite; Gunnison County: small quantities in several mines; Ouray County: several mines; Rio Grande County: Summit District, both auriferous and argentiferous; often carries free gold; with pyrites only in quartz matrix; San Juan County: has been mined in Red Mountain, argentiferous, with tetrahedrite and galena in quartz veins
- EPIDOTE. Chaffee County: Calumet, fine crystals; Fremont County: occurs near Canon City; Gunnison County: occurs on Italian Mountain
- EPSOMITE. In coal mines, mineral water, alkali deposits and alkali lakes
- ERYTHRITE. Gunnison County: Teocalli Mountain
- FELDSPAR (microline). El Paso County: near St. Peter's has been prospected and some sold to potteries; Larimer, Park, Fremont and Chaffee Counties
- FERBERITE. Boulder County: Boulder, Nederland in veins cutting granite, pegmatite and gneiss, mined, Sunshine; Clear Creek County: small finds reported; Gilpin County: two and one half miles north of Black Hawk, mined
- FLUORSPAR (fluorite). Boulder County: mined at Jamestown and shipped; Chaffee County: Mount Antero; Clear Creek County: at Georgetown; Custer County: mined at Rosita; Dolores County: abundant gangue mineral in Black Hawk Mine and prospects of Silver Creek, Rico region; Douglas County: at Devil's Head; El Paso County: in quantity at Elk Creek, near Cheyenne and Pikes Peak, mined at Duffields; Gilpin County: Gregory and Russell Districts; Gunnison County: in lead ores near Sherrod, Iron Hill and southeast of Powderhorn; Jefferson County: mined at Evergreen; Mineral County: mined at Wagon Wheel Gap; Park County: in northern part of Halls Valley; shipped from Jefferson; San Juan County: in quartz veins in Poughkeepsie Gulch; San Miguel County: in Telluride District; Teller County: Cripple Creek with gold tellurides; Ouray County: Sneffels District

FREIESLEBENITE. Gunnison County: on Augusta Mountain

FULLER'S EARTH. Chaffee County: low grade near Salida

GADOLINITE. Douglas County: mined on Devil's Head Mountain; Washington County: was dug at Akron

GALENA (argentiferous, auriferous lead ore). Boulder County: in small quantity in tungsten-bearing veins of Boulder District; Chaffee County: in Alpine, Chalk Creek and Cottonwood Districts; Clear Creek County: in mines six miles southwest of Idaho Springs; carries gold and silver; Dolores County: important ore mineral of Rico District, abundant in Enterprise Mine, also Union, Carbonate and Newman Mines, argentiferous; Eagle County: in Red Cliff (Battle Mountain) District; Fremont County: at Cotopaxi; Gilpin County: reported with uranium in Wood, Kirk and other mines near Central City; Gunnison County: mined at Blistered Horn, Tincup District; Sandy Hook, Gold Links, Gold Brick District and elsewhere, Elkhorn and Tomichi Districts carries gold and silver; Hinsdale County: Galena District, five miles west of Lake City; Lake County: important ore at Ohio Mines, carries silver and gold, silver-lead mines at Leadville; Park County: Horseshoe District, seven miles west of Garo on easterly slope of Mosquito Range; Pitkin County: common silver-bearing ore in Aspen District, Mollie Gibson and other mines; Routt County: mined in Slavonia District and at Columbine and near Hahns Peak (Minnie D. and Tom Thumb Mines) carries gold; Summit County: in veins in Montezuma District; Teller County: small quantities in many mines in Cripple Creek District; most mines in the San Juan Triangle; occurs in many other mines

GARNET. Chaffee County: spessartite variety in rhyolite, east side of Arkansas River opposite Nathrop on Ruby Mountain, large brilliant crystals near Salida, worked intermittently; Fremont County: Grape Creek, two miles southwest of Canon City, almandine variety, handsome gems cut, occurs also at Sedalia Mine; Gunnison County; grosularite variety on Italian Mountain

GAS. See Natural gas

GILSONITE. Fissure deposits in sedimentaries in western Rio Blanco

GLASS SAND (silica). Jefferson, Chaffee, Douglas, El Paso, Fremont and many other counties in Colorado

**GOLD** (lode). A predominant metal produced in the following districts: Boulder County: Central, Gold Hill, Grand Island, Magnolia, Sugarloaf and Ward; Chaffee County: Granite, Riverside and Turret; Clear Creek County: Argentine, Idaho Springs, Lincoln and Upper Union (Empire); Conejos County: Ute (Platoro) forty-five miles southwest of Monte Vista; Dolores County: secondary importance in Lone Cone and Pioneer (Rico) Districts; Eagle County: Fulford and Holy Cross; Fremont County: White Horn, twenty-six miles northeast of Salida; Gilpin County: Central City, Independence and Pine; Grand County: Grand Lake (Wolverine) and La Platte; Gunnison County: Box Canyon, Cebolla, Cochetopa, Gold Brick, Tineup and White Earth; Hinsdale County: Park (Sherman); Huerfano County: La Veta; Lake County: Twin Lakes, minor importance at Leadville; La Plata County: California, Needle Mountains (Florida); Montezuma County: East Mancos; Ouray County: Imogene Basin (Camp Bird), Sneffels and Uncompahgre; Park County: Buckskin, Consolidated-Montgomery, Hartsel, Mosquito, Tarryall; Rio Grande County: Decatur, Embargo, Summitville; Routt County: Hahns Peak; Saguache County: Baca, Grant (Cresponse); San Juan County: Animas (Silverton), Eureka, San Miguel County: Iron Springs (Ophir), Lower San Miguel, Upper San Miguel (Telluride); Summit County: Breckenridge, Frisco, Swan River; Teller County: Cripple Creek from reduction of tellurides; see also Amalgam, Calaverite, Petzite and Sylvanite

**GOLD** (placer). Produced in the following districts: Chaffee County: Granite; Clear Creek County: Lincoln; Costilla County: Greyback and Plomo; Eagle County: Holy Cross (Eagle River); Jefferson County: Golden; Lake County: Twin Lakes, nine miles northwest of Granite; Moffat County: Lay (Jack-rabbit); Park County: Mosquito and Tarryall; Routt County: Hahns Peak; San Miguel County: Lower and Upper San Miguel (Placerville and Telluride); Summit County: Breckenridge, Swan River; produced in minor quantity in several other districts

**GOSLARITE**. Lake County: at one time abundant in the old dumps containing zinc blend at Leadville

**GRAHAMITE**. Grand County: near Granby

**GRANITE**. Boulder County: Craggs, Crescent, Lyons (quarried); Chaffee County: Barre, Granite, Salida, Turret (quarried); Clear Creek County: Lawson, Silver Plume; Douglas County: Castle Rock; El Paso County: Cascade; Fremont County: quarried at Cotopaxi, Texas Creek and Whitehorn; Gunnison County: fine grade at Aberdeen Quarries, State Capitol is built of it; Jefferson County: quarried at Stone Spur, Buffalo

Creek and Golden; La Plata County: Durango; Larimer County: Masonville, United States Mint at Denver is built of it; Arkins and other points; Pitkin County: ten miles southeast of Aspen; Rio Grande County: Del Norte; quarries also opened at O'Neill Spur, Platte Canyon

**GRAPHITE.** Chaffee County: good quality amorphous graphite, mined near Turret; originally coal, metamorphosed by igneous intrusions; Gunnison County: occurs three and one half miles north of Pitkin; branches of Quartz Creek, impure, in quartz veins two and one-half feet thick; Las Animas County: near Trinidad; carbon derived from coking coal by igneous intrusion.

**GRAVEL.** Building and ballast; most every county in the State

**GREENNOCKITE.** Reported with zinc ores at Leadville, San Juan and elsewhere

**GRINDSTONES.** Gunnison County

**GUMMITE.** An alteration of uraninite; Jefferson County: Front Range of Colorado; Gunnison County: Colorado Plateau

**GYPSUM.** Custer County: occurs near Arkansas River; Delta County: west side of Grand Canyon of Gunnison River into Montrose County; Dolores County: as gangue mineral, Rico region and elsewhere; Eagle County: at Ruedi, worked recently, occurs along Grand and Eagle Rivers; El Paso County: has been worked extensively near Perry Park and near Colorado Springs; Fremont County: Coaldale and Canon City; Jefferson County: opened near Mount Morrison; Larimer County: worked extensively at Arkins near Loveland; thick bed at Owl Canyon and on Sand Creek east of Boxelder and at several other localities; Montrose County: several places

**HEMATITE** (red iron ore). Gunnison County: prospects near Whitepine and north of Iola station; Lake County: has been mined at Breece Iron Mine, Breece Hill near Leadville, very pure ore, large irregular deposits in porphyry; Pitkin County: very common in mines of Aspen District; occurs many places in the State

**HESSITE** (telluride of silver). Boulder County: Gold Hill District, important ore; Eagle County: Redcliff; La Plata County: occasionally important, has been mined; Hinsdale County: Hotchkiss Mine

**HETAEROLITE** (wolfftonite). A hydrous zinc-manganese oxide found in the oxidized zinc ores of Leadville

**HINSDALITE.** Hinsdale County: Golden Fleece Mine near Lake City

**HUBNERITE.** Lake County: Leadville, in gold ore and with scheelite in gold-bearing quartz-pyrite veins; Ouray County: Royal Albert vein, Uncompahgre District, mined; San Juan County: several mines near Silverton and Gladstone have been mined; San Miguel County: Ames

**HYDROZINCITE.** Of rare occurrence in Leadville oxidized zinc ores

**INFUSORIAL EARTH.** See Diatomaceous earth

**IRON.** Chaffee County: predominant metal in South Arkansas District; see also Brown Iron Ore, Hematite, Magnetite, Marcasite, Pyrite, Pyrrhotite and Siderite; Gunnison and San Miguel Counties

**JET.** Las Animas County: Wet Mountain Valley, Trinchera Mesa

**KAOLIN.** See Clay

**KRENNERITE.** Teller County: Cripple Creek, Independence and other mines

**LAVA.** Probably tuff, suitable for many uses in buildings; quarried in Douglas County at Castle Rock; Fremont County at Howard; Gunnison County at Gunnison; Rio Grande County at Del Norte and other places

**LEAD.** Lead is a predominant metal produced in the following districts: Chaffee County: Alpine, Chalk Creek, Cottonwood; Clear Creek County: Trail, six miles southwest of Idaho Springs; Custer County: Spaulding, fourteen miles southwest of Florence; Gunnison County: Elk Mountain, Tomichi; Hinsdale County: Galena five miles west of Lake City; Lake County: California (Leadville); Park County: Horseshoe, seven miles west of Garo; Pitkin County: Columbia, Frying Pan, Roaring Fork (Aspen); Routt County: Slavonia, forty miles north of Steamboat Springs; Saguache County: Blake (Kerber Creek); San Juan, San Miguel and Ouray Counties; Summit County: Montezuma (Snake River); lead is produced but is less important in many other districts; see also Altaite, Anglesite, Cerussite, Cosalite, Galena, Massicot, Mimetite, Minium, Plumbojarosite and Pyromorphite

**LIMESTONE.** Boulder and Larimer Counties: limestones of Lykins, Morrison and Niobrara formations burned for lime along foothills of northern Colorado; Chaffee County: limestone quarried at Garfield and Newett; Douglas County: near Littleton; Arapahoe County: has been quarried at Silica for lime; El Paso County: Manitou, used for lime; Fremont County: quarried at Canon City and Calcite for crushed stone; Jefferson County: quarried at Mount Morrison and Golden; La Plata County: Rockwood; Larimer County: Ingleside for sugar refining; Mesa County: near Dominguez; Pitkin County: burned at Thomasville; Pueblo County: quarried at Lime near Pueblo, Livesay; abundant in many counties

**LIMONITE.** See Brown Iron Ore

**LITHIUM.** See Amblygonite. Gunnison, Fremont and Chaffee Counties



**MAGNETITE** (magnetic iron ore). Chaffee County: has been mined in Arkansas Hills, nine miles from Salida; Costilla County: interbedded with limestone at Grayback Gulch, five miles from Placer station; Dolores County: with chalcopyrite in Magnet and Eagle prospects, has been mined for flux; Fremont County: Iron Mountain near Pine Creek, titaniferous; Gunnison County: prospects on Saguache Mountains and in Cebolla District; Pitkin County: prospects in Elk Mountain Divide, six miles south of Ashcroft

**MALACHITE** (green copper carbonate). Occurs in hundreds of places, among them: Fremont County: mined at Sedalia Mine; Montrose County: in ores of Cashin Mine, La Sal Creek; Routt County: prospects on Hahns Peak; San Juan County in Bear Creek District; Red Mountain District

**MANGANESE**. Eagle County: considerable manganiferous silver ore mined at Iron Mack Mines, Gilman; Lake County: large output from lead-silver mines of Leadville District; see also Alabandite, Chalcophanite, Psilomelane, Pyrolusite and Rhodochrosite; San Juan County: Rhodenite

**MARBLE**. Boulder County: small deposits; Chaffee County: Buena Vista, Calumet, Maysville, Monarch and Salida; Fremont County: Fremont; Gunnison County quarried extensively at Marble and along Yule Creek; Larimer County: small beds west of Fort Collins; Pitkin County: Aspen, quarried at Crystal City; also in other localities

**MARCASITE**. Occurs in hundreds of mines as in Routt County, in veins of Hahns Peak District; San Juan County: in ore bodies in Bear Creek District; San Miguel and Ouray Counties

**MASSICOT** (oxide of lead). Occurs in many mines. Dolores County: with galena ores near Rico, argentiferous; Lake County: Leadville and elsewhere; San Miguel County: with galena in Upper San Miguel region, argentiferous

**MELACONITE**. Pitkin County: thin coatings in Aspen District mines

**METAHEWETTITE**. Montrose County: Paradox Valley; Hummer Mine

**MERCURY**. Boulder County: sparingly in tellurium-bearing mines

**MICA** (muscovite). Clear Creek County: reported from Idaho Springs; Fremont County: mined near Canon City and at Micanite; Jefferson County: Morrison; Larimer County: Buckhorn Creek; Mesa County: has been mined eight miles south of Grand Junction

**MICA** (phlogopite). Gunnison County: Iron Hill area, southeast of Powderhorn

- MIMETITE.** Chaffee County: Monarch and Garfield Districts; Lake County: Leadville
- MINERAL PAINT.** See Morrisite
- MINIUM.** Lake County: Leadville; Pitkin County: in oxidized ores of Aspen District and at other places; San Miguel County: Telluride
- MOLYBDENITE** (sulphide of molybdenum). Chaffee County: small quantities near Buena Vista and other places; Grand County: with molybdenum ochre on Grand River, one and one-half miles above Radium; Gunnison County: two miles from Pitkin in quartz veins; Lake and Summit Counties: Fremont Pass; Climax, largest molybdenum mine in the world; San Juan County: near Silverton; Teller County: Cripple Creek District; occurs at many other places
- MONAZITE.** Chaffee County: in black sands at Buena Vista; Costilla County: San Luis Valley; Routt County: Timber Lake; Gunnison County
- MORRISITE.** Occurs in the eastern part of the State
- MUSCOVITE.** See Mica
- NATURAL GAS.** Boulder County: considerable quantity produced from Boulder Field; Costilla County: near Mosca and other places in San Luis Valley; Delta County: occurs in oil shales of Green River formation on head of Muddy Fork; Fremont County: considerable quantity produced from Florence Field; Pitkin County: "blowers" in middle cretaceous shales at Coal Basin, natural flow limited; Pueblo County: Nepesta; Dolores, Montezuma, La Plata, all four corners of Colorado, helium gas in southeast Colorado; all CO<sub>2</sub> in Delta, Dolores and other petroleum producing counties
- NICCOLITE.** Custer County: small quantity at Silver Cliff; Fremont County: occurs at Gem Mine, Grape Creek Canyon in dolomite with bornite and rarely with native silver
- NICHOLSONITE.** A zinc-bearing aragonite occasionally found near oxidized zinc ore bodies at Leadville
- NICKEL.** See Annabergite and Niccolite
- OIL.** See Petroleum
- OIL SHALE.** See Shale; Garfield, Mesa and Rio Blanco Counties
- OPAL.** Opal of inferior quality is found at several places; Buffalo Peaks, Cripple Creek, Idaho Springs and Ute Creek
- PEARCEITE.** Pitkin County: Mollie Gibson Mine at Aspen massive in large quantity disseminated through pink barite and in tabular crystals embedded in siderite in both forms associated with galena

PERLITE. Custer and Fremont Counties

PEROFSKITE. Gunnison County: Iron Hill area, southeast of Powderhorn; very abundant constituent of iron ore

PETROLEUM. Boulder County: Boulder Oil Field, three miles northeast of Boulder, high-grade light illuminating oil; Fremont County: south of Florence, field ten to twenty square miles; Mesa County: small wells near De Beque; Rio Blanco County: Rangely Oil District; Routt County: Yampa Field, used as a lubricant; petroleum has been found also in Archuleta, Pueblo and Moffat Counties. The production of petroleum in Colorado in 1914 was 222,773 barrels, valued at \$200,894. 1958 production was 48,736,368 barrels, valued at \$144,747,010. Found in all four corners of Colorado

PETZITE (telluride of gold and silver). Found in many mines in Colorado in Clear Creek, Gunnison and Hinsdale Counties; Boulder County: Red Cloud and other mines; San Juan County: most valuable ore in Gold Bug and other mines in Bear Creek District

PHENACITE. Chaffee County: occurs at Mount Antero and Devil's Head; El Paso County: occurs in Crystal Park, two miles southward of Manitou, has been mined at Pikes Peak as gem stone; Teller County: Topaz Butte near Florissant, Cripple Creek in the Gold King Mine

PITCHBLEND. Clear Creek County: Joe Reynolds Mine; Gilpin County: Kirk, Wood, German, Calhoun and Belcher Mines near Central City; Fremont, Gunnison and Jefferson Counties: in several mines; Moffat, San Miguel, Mesa and Montrose Counties: Colorado Plateau; largest producing area in State

PLATINUM. Chaffee County: occurs in black sands of Buena Vista; Clear Creek County: Centennial Mine, Georgetown; Pitkin County: Aspen; Saguache County: Liberty; San Miguel County: Telluride in small quantities; Jackson County

PLUMBOJAROSITE. Occurs with lead-carbonate ores at Leadville and doubtless in other silver-lead districts

POLYBASITE. Clear Creek County: mines at Georgetown and Silver Plume; Dolores County: considerable quantity at Newman Hill Mine, Rico District; Ouray County: Yankee Girl Mine; Pitkin County: Molly Gibson and Smuggler Mines, Aspen District; San Juan and San Miguel Counties: Red Mountain District; San Miguel County: Marshall Basin; occurs in quartz veins with pyrrargyrite, sphalerite, stephanite not uncommon in Mendota Mine

POTASH. Occurs with other salts in solution in soda lakes near San Luis Lakes, Costilla County being exploited; see also Alunite

**PROUSTITE** (ruby silver, light). Dolores County: Newman Hill Mine, Rico District; Gunnison County: small quantity with arsenopyrite in Ruby District; Ouray County: Sneffels, Uncompahgre and Red Mountain area; Routt County: veins of Hahns Peak District; San Miguel County at various mines; occurs also in many other Colorado mines

**PSILOMELANE**. Chaffee County: small quantity near Garfield; Custer County: south of Round Mountain at Silver Cliff; Lake County: in the manganiferous ores of Leadville

**PUMICE**. Volcanic Ash in Teller, Park, La Plata, Huerfano, Custer, Mineral, Washington, Weld and Grand Counties

**PYRARGYRITE** (ruby silver, dark). Clear Creek County: Georgetown Mining District; Dolores County: reported from Newman Hill Mine; Gilpin County: rare near Central City; Gunnison County: Ruby District; Hinsdale County: near Lake City; Ouray County: Sneffels and Paquin Districts; Routt County: Hahns Peak region; San Miguel County: Marshall Creek Basin; Summit County: Montezuma

**PYRITE**. Pyrite is found in nearly every county along the Rocky Mountains; Boulder County: Ward District; Clear Creek County: Georgetown Mining District; gold, silver ore; Dolores County: important ore of Rico District; carries small quantities of gold and silver, mined at Enterprise, Union, Carbonate and other mines; Eagle County: Battle Mountain; Fremont County: mined at Sedalia Mine for gold; Gilpin County: abundant important gold ore; Gunnison County: Sandy Hook and Gold Links Mines carries gold; Vulcan, large body cupriferous; Hinsdale County: Lake City; Lake County: mined at Leadville; La Plata County: Neglected Mine, fifteen miles from Durango; Larimer County: Pearl; Ouray County: mines along Uncompahgre River between mouth of Dexter Creek and Ouray, contains gold and silver, common in other places; Pitkin County: original sulphide of Aspen District ore bodies, mined for silver; Rio Grande County: Summit District; Routt County: common vein mineral of claim on Farwell Mountains, Hahns Peak region; San Juan County, Silverton District, mined at Ohio Mine; common at many mines, San Miguel County: common

**PYROCHLORE**. Gunnison County: probable deposits in Powderhorn area

**PYROLUSITE** (black oxide of manganese). Gunnison County: occurs in Steuben Valley, six miles southwest of Gunnison and in Cebolla Valley; Hinsdale County: occurs near Lake City; Saguache County: Beidell

**PYROMORPHITE**. Lake County: occasionally found in oxidized ores of Leadville

**PYRRHOTITE** (magnetic iron pyrites). Chaffee County: Monarch and Garfield area; Jefferson County: Malachite Mine and many other places; San Juan County: has been mined in Needle Mountains, auriferous

**QUARTZ**. Jefferson County: mined from veins in foothills near Golden and used in manufacture of fire brick at Golden, common vein rock in most Colorado mining areas

**QUARTZ** (moss agate, silicified wood, smoky quartz, clear quartz and crystal quartz). Very common and much used in the manufacture of jewelry, ornaments, etc. Smoky quartz occurs near Pikes Peak and is known as "Smoky Topaz" or "Cairngorm Stone"

**QUARTZ** (rose). Fremont County: six miles north of Texas Creek, some mined as gems; Jefferson County: Floyd Hill, Bear Creek, etc.; Larimer County: large body in granite twenty-five miles west of Ft. Collins, cut as gem stone

**QUICKSILVER**. Boulder County: occurs in Magnolia District; La Plata County: Ruby claim south of Cumberland Peak; see also Amalgam and Cinnabar

**RADIUM**. See Carnotite and Pitchblende

**RARE EARTHS**. In Colorado granites and pegmatite dykes Front Range of Colorado; Gunnison County: Powderhorn District; Custer County: Wet Mountain District

**RHODONITE**. San Juan County: San Juan Triangle

**RHODOCHROSITE**. Boulder County: Ward District; Dolores County: gangue mineral of Newman Hill and Enterprise Mines, Rico region; Lake County: Alicante; San Juan County: in several mines; Summit County: Peru District; Gunnison County: Crested Butte area

**RICKARDITE**. Gunnison County: Good Hope near Vulcan

**ROAD METAL**. Disintegrated granite and other rocks; when not too badly decayed are extensively used for ballast and road building. Paving blocks called Belgian blocks are made of different kinds of stone, such as dolerite (basalt) of Golden and Valmont, certain rhyolites and other rocks

**ROSCOELITE**. Boulder County: sparingly in gold veins; Rio Blanco County: reported to occur along Coal Creek, near Meeker; San Miguel County: large deposits at Newmire and Placerville; in several other counties in western Colorado in scaly bunches and irregular grains in the La Plata sandstone; San Juan County: Graysill Mines

**ROSE QUARTZ**. See Quartz (rose)

**RUTILE**. El Paso County: occurs near St. Peter's Dome, Pikes Peak District

SAND (building). Dug at many places; Denver County: Denver; Fremont County: Canon City; La Plata County: Animas City and Durango; Pueblo County: Pueblo; Rio Grande County: Monte Vista; produced in every county in the State

SAND (molding). Dug at Denver and Pueblo

SANDSTONE. Boulder County: quarried at Boulder, Lyons and Noland; Conejos County: Osier; Delta County: Austin, Delta; Douglas County: Castle Rock, Sedalia; Eagle County: Basalt, Peachblow; El Paso County: Colorado City and Manitou; Fremont County: Canon City, Florence; Jefferson County: Mount Morrison, La Plata County: Durango; Larimer County: Arkins, Lowery, Bellvue, Stout, Ft. Collins and Loveland; Las Animas County: Trinidad; Mesa County; Montrose County: Olathe; Pueblo County: Beulah, Pueblo and Turkey Creek; Rio Grande County: Del Norte; Routt County: Steamboat Springs

SANDSTONE (asphaltic). Grand County: Upper Willow Creek, sec. 24, T4N, R77W

SAPPHIRE. Chaffee County: Chalk Creek, eight miles south of Buena Vista in College Range

SCHEELITE. Boulder County: small quantities with ferberite in the Boulder District; Chaffee County: three and one-half miles east of Salida with copper minerals; Lake County: Leadville with hubnerite in gold ore in quartz-pyrite veins, Golden Queen Mine; San Juan County: near Silverton and Gladstone with hubnerite

SERPENTINE. Gunnison County: near Gothic; Park County: Buckskin Gulch, a mottled rock, largely calcite, deeply colored by true serpentine; prospective use as ornamental stone

SHALE (oil). In Green River formation (Eocene); some rich in oil; some large areas in northwestern part of State on tributaries of Green and Grand Rivers; Rio Blanco and Garfield Counties: extensive deposits, constituting the greater part of the rocks of the Green River formation; in the Book Cliffs the richer rock occurs in bands about fifty in number from two to fifteen feet thick; destructive distillation gives from fifteen to thirty-five percent of condensed hydrocarbons, ten to twenty percent of gas; prospective source of lubricating oil, gasoline, kerosene, ammonium sulphate and fuel oil

SIDERITE. Manganosiderite in large quantities in mines at Leadville, Lake County; Red Cliff in Eagle County; Gunnison County: occurs with magnetite and hematite in Cebolla Valley, near Powderhorn; Jefferson County: occurs near Bear Creek, zinciferous; Pitkin County: occurs in iron ore near Ashcroft, Taylor Peak District

SILICA. See Sandstone, Fremont County

**SILVER.** A predominant metal produced in the following districts: Chaffee County: La Plata, Monarch-Garfield; Clear Creek County: Georgetown, Jackson, Montana; Custer County: Hardscrabble (Rosita, Silver Cliff); Dolores County: Lone Cone and Pioneer (Rico); Eagle County: Battle Mountain (Red Cliff); Gunnison County: Quartz Creek, Rock Creek, Ruby; Hinsdale County: Lake (San Cristobal); Mineral County: Sunnyside (Creede); Park County: Halls Gulch and Sacramento; Pitkin County: Lincoln; Saguache County: Crystal Hill; San Juan, San Miguel and Ouray Counties; Summit County: Peru, Tenmile (Kokomo); silver is of minor importance in many other districts; see also Acanthite, Amalgam, Calaverite, Cerargyrite, Embolite, Empressite, Hessite, Krennerite, Pearceite, Petzite, Polybasite, Proustite, Pyrargyrite, Stephanite, Stromeayerite and Sylvanite

**SILVER** (native). Boulder County: occurs in Caribou Mine and Up-To-Date property and mines of Ward District, especially the White Raven; Clear Creek County: small quantity of wire silver found in Georgetown District; Dolores County: reported from Enterprise and Puzzle Mines; Gunnison County: occurs in Ruby District and near Gothic; Hinsdale County: Galena District; Lake County: occasionally found in silver-lead mines at Leadville; La Plata County: occurs along Bear Creek, usually with galena, tetrahedrite and stephanite; Montrose County: Cashin Mine, La Sal Creek; Pitkin County: irregular wires and masses of silver in Molly Gibson and Smuggler Mines, Aspen District; Teller County: in small quantities in many mines in Cripple Creek District; Ouray, San Juan and San Miguel Counties

**SMALTITE** (gray cobalt ore). Gunnison County: occurs near Gothic in calcite gangue, associated with small quantities of erythrite and native silver

**SMITHSONITE.** In large ore bodies in Leadville and Monarch Districts and doubtless in other silver-lead districts

**SPHALERITE** (zinc blende). Chaffee County: Monarch and Garfield area; Clear Creek County: Georgetown and Silver Plume Mines; Idaho Springs District carries silver; Dolores County: with galena and chalcopryrite in Rico District, abundant in Newman Hill silver ores and Sambo Mines, mined for zinc alone in Atlantic Cable Mine; Fremont County: Sedalia Mine; Gilpin County: a common mineral usually argentiferous, sometimes highly so, and occurring with pyrite, chalcopryrite, galena and tetrahedrite, has been mined for silver; Gunnison County: Blistered Horn, Tincup District, Sand Rock, Gold Links, Gold Brick District and other mines carry silver, Vulcan District; Hinsdale County, LaPlata, Ouray and San Miguel Counties a very common, usually argentiferous mineral, common associate galena, in many places with chalcopryrite, tetrahedrite or pyr-

argyrite; Jefferson County: Malachite Mine; Lake County: silver-lead mines at Leadville; Mineral County: Creede; Saguache County: Beidell; San Juan County: Ohio Mine near Whitecross; mined for gold and silver; Eagle County: Eagle Mine; found also in other mining counties

SPINEL. Fremont County: Sedalia Mine

STEPHANITE (brittle silver). Clear Creek County: frequently associated with other silver-bearing minerals; Dolores County: reported from Newman Hill Mine, Rico region; Gunnison County: Red Jacket; Hinsdale County: limited quantity in Galena District; Ouray County: occasionally found in Sneffels and Uncompahgre Districts; Summit County: occurs in Montezuma Mining District; mined also at other places

STIBNITE (antimony sulphide). Not known in commercially valuable deposits though small quantities are found in many mining districts; Boulder County: several mines; Clear Creek County: Alice Mine; Grand County: Lost Lakes; San Juan County: North Star Mine; Teller County: Cripple Creek District

STROMEYERITE (copper and silver sulphide). Boulder County: Grand Lodge; Clear Creek County: with bornite, tetrahedrite, etc., at Plutus Mine, Idaho Springs occasional; Ouray County: in quantity at Red Mountain District; San Juan County: certain Silverton mines, Iron Springs District

SULPHUR. Gunnison County: has been mined at Vulcan; Mineral County: occurs twenty-five to thirty miles southwest of Creede at Trout Creek; Delta County: near Paonia; several other deposits are reported

SYLVANITE. Boulder County: associated with tungsten ore at mines in Boulder District; La Plata County: occurs at Durango Girl Mine on east slope of Lewis Mountain; Teller County: important gold ore of Cripple Creek District; occurs also at other places

TANTALUM. See Columbite

TALC. See Kaolin, Clay

TELLURIUM. Boulder County: in a number of mines; Teller County: mines at Cripple Creek; San Juan County: mines in the San Juan Triangle

TENNANTITE. Much of the so-called tetrahedrite of the sulphide ores of Colorado is tennantite. Clear Creek County: occurs in silver-bearing ores at Silver Plume Mines; Gilpin County: in a large number of mines; Pitkin County: very common in Aspen District, Molly Gibson and other mines; Ouray, Hinsdale and San Juan Counties

TETRADYMITE (bismuth telluride). Boulder County: Red Cloud Mine; Fremont County: occurs near Whitehorn



**TETRAHEDRITE** (gray copper ore). In many mines in Boulder, Clear Creek, Gunnison, San Juan and other counties; Clear Creek County: mined for silver in Georgetown and Silver Plume Mines; Dolores County: silver bearing in Rico District, Enterprise and Rico-Aspen Mines; Gilpin County: reported with uranium in Wood, Kirk and other mines near Central City; Gunnison County: reported from Ruby District; Hinsdale County: has been mined near Lake City; Ouray and San Miguel Counties, very abundant in silver ores; Pitkin County: very common in Aspen District, Molly Gibson and other mines; San Juan County: important ore of Ohio Mine near Whitecross mined for silver; Bear Creek District, Gold Bag and other mines, gold and silver bearing; Teller County: mined in Cripple Creek District; much of the ore called tetrahedrite in Colorado is tennantite

**THORIUM.** See Monazite, Gunnison County

**TIN.** See Cassiterite, Climax Mine, Lake County

**TITANIUM.** See Ilmenite, Rutile and Perovskite, Gunnison County near Powderhorn

**TOPAZ.** Chaffee County: Mount Antero and Ruby Mountain on east side of Arkansas River near Nathrop; El Paso County: Crystal Park, two miles southwest of Manitou Springs; Lake County: Chalk Mountain near Leadville; San Juan County: found occasionally; Teller County: Pikes Peak and mined intermittently at Crystal Peak four miles north of Florissant

**TORBERNITE** (uranium oxide). Veins in the pegmatite area of the Front Range and Colorado Plateau

**TOURMALINE.** Fremont County: two miles north of Royal Gorge and five miles northwest of Canon City, opaque but colored; Gilpin County: near Black Hawk; Larimer County: Estes Park; Teller County: Rhyolite Mountain

**TRONA.** Deposits estimated at 100,000 tons or more in the soda lakes of the San Luis Valley, some development done; sparingly in other alkali lakes and areas

**TUNGSTEN.** See Ferberite, Hubnerite and Scheelite

**TURQUOISE.** Conejos County: thirteen miles east of La Jara; Eagle County: Mount of Holy Cross; Mineral County: Last Chance Mine, Creede; Saguache County: near Villa Grove

**URANIUM MINERALS.** See also Carnotite and Pitchblende. Montrose, Mesa, San Miguel, Dolores, Moffat, Rio Blanco, Larimer, Boulder, Fremont, Saguache, Gunnison, El Paso, Douglas and many other counties in sandstones, shales and pegmatite dykes

**URANINITE.** See Pitchblende

URANOPHANE. Yellow uranium oxide, pegmatite dykes of Colorado

VANADINITE. Montrose, Mesa and San Miguel Counties

VANADIUM See also Volborthite. Found in many localities as carnotite, rosecoelite, calciovolborthite, and possibly volborthite; Custer County: seven or eight miles southeast of Silver Cliff, reported to occur as in Huerfano County; Eagle County: with silver ores in sandstone on Brush Creek, form of mineral unknown; Huerfano County: in an unidentified mineral near head of Pass Creek, south of Malachite; Montrose County: found in the Paradox Valley as calcium vanadate, possibly two forms; San Juan County: Hermosa Creek

VESUVIANITE. Gunnison County: Mount Italia and north of Arkansas River in granite

VIVIANITE. Lake County: Leadville

VOLBORTHITE. Huerfano County: near head of Pass Creek south of Malachite; the mineral has not been definitely identified but is probably either volborthite or calciovolborthite or both; La Plata County: Boren Gulch; vanadium occurs in a quartz vein in a mineral which is probably volborthite or calciovolborthite and also in an amorphous yellowish green mineral; Park County: reported from Garo

VOLCANIC ASH. Exists in enormous quantity in several of the eastern counties; La Plata County: near Durango; Teller County: Cripple Creek; Yuma County: has been shipped from Wray for scouring powder; southern and central Colorado; Saguache, Las Animas Counties

WOLFRAMITE. Boulder County: near Boulder; Ouray and San Juan Counties

WULFENITE. See Hetaerolite

WOOD (opalized). El Paso County: has been obtained in eastern part of county with jasperized wood, Bijou Basin; silicified wood is very common

YTTRIUM. See Allanite and Gadolinite

ZEOLITES. Jefferson County: Table Mountain near Golden

ZINC. Fremont County: a predominant metal in Currant Creek (Micanite) District; San Juan Triangle and Front Range Mines; see also Aurichalcite, Calamine, Chalcophanite, Hetaerolite, Hydrozincite, Nicholsonite, Smithsonite and Sphalerite

ZIRCON. St. Peter's Dome near Pikes Peak