DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY , [Mineral investigations resource map], MR series, [Text] TO ACCOMPANY MAP MR-43

BARITE IN THE UNITED STATES

(Exclusive of Alaska and Hawaii)

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Introduction

The mineral barite, barium sulfate, is the chief source of barium and its compounds needed for many industrial processes and products. Barite is found the world over and is abundant and widely distributed throughout the United States. The barite deposits of the United States (exclusive of Alaska and Hawaii) are shown on the accompanying map. The principal geologic type of deposit is indicated by the shape of symbol and the relative importance of the deposit is indicated by the size of symbol.

This text lists localities by State, and index numbers are keyed to the map. Localities are distinguished by name of mine, prospect, or geographic area; their coordinates are given to the nearest minute of latitude and longitude. Geologic relations of each occurrence, if known, are summarized briefly. The text and map were compiled from published and unpublished information, and at least one reference is given for each locality, if reports have been published. The listings in some States are preceded by a principal reference which is a major source of information about deposits in those States.

Uses

About one million tons of barite have been consumed annually in the United States during 1958-61. Of this, about 95 percent is used as weighting agent for drilling fluids in the petroleum industry. Finely ground barite in the fluid serves chiefly to retain high oil and gas pressures in source beds at depth, thus preventing "blowouts" or "gushers." The other 5 percent is used in a great variety of products and manufacturing processes, especially in the glass, paint, rubber, and chemical industries.

Barite is used in the manufacture of glass where it aids in homogenizing the melt and gives greater brilliance to the glass. In the manufacture of paint, barite is used as both a filler and a pigment. The white pigment lithopone is composed of about 70 percent barium sulfate and 30 percent zinc sulfide. The use of lithopone has declined in recent years since the introduction of titanium pigments.

Ground barite is used as a filler in many products, such as bristol board, playing cards, linoleum, brake linings, rope finishes, soft rubber goods, and some plastics. Chemically produced barium sulfate ("blanc fixe") is used as a filler in paint, ink, linoleum, textiles, and other products where higher purity is required than is normally found in natural barite.

Barium chemicals are used widely in industry. The preparation of most barium compounds from barium sulfate involves roasting with carbon and the reduction to barium sulfide. Water-soluble barium sulfide can then be converted to other desired compounds. Major products of the chemical plants are the carbonate, chloride, nitrate, hydroxide, peroxide, oxide, and sulfate of barium.

A mixture of barium and iron oxides is useful in making permanent magnets. Barium titanate ceramics have unusual electro mechanical properties which suit them for use in transducers, phonograph pickup cartridges, digital computers, and many other electronic and ultrasonic devices. Barium acetate is used as the electrolyte in the process of depositing phosphor powder on the inside face of television tubes. Barium metal is used as a "getter" to absorb gases to improve the vacuum of tubes.

Barite is used as aggregate where high-density concrete is needed, as that used to keep pipelines buried in marshy places. Concrete with barite aggregate can be used in shielding atomic reactors because it has high resistance to penetration by gamma rays. A mixture of synthetic rubber and fine-grained barite can be combined with hot asphalt for roads, airport runways, and parking lots to produce a tight, flexible seal coating which prolongs the life of the road surface.

Further information on production and uses of barite is found in the barite chapters of the Minerals Yearbook, an annual publication of the U. S. Bureau of Mines. Much information on the uses of barium is found in a bibliography on barium published in 1961 by the Food Machinery and Chemical Corp.

Geology

Barite deposits have been classified by mode of occurrence into three principal types: vein and cavity-filling deposits, bedded deposits, and residual deposits (Brobst, 1958, 1960).

Vein and cavity-filling deposits. In this type of deposit barite and associated minerals occur along faults, gashes, joints, and bedding planes, and in breccia zones and solution channels. They also occur in various collapse and sink structures in limestone. Sharp contacts of the veins and cavity-fillings with wallrocks are common. Barite cements fault and collapse breccia by replacement of the matrix or by filling of voids. Large-scale replacement of the wallrocks beyond ore-controlling structures is rare. Barite in vein and cavity-filling deposits is generally dense, "hard," and white to gray. Associated minerals are fluorite, calcite, ankerite, dolomite, quartz, and many sulfide minerals, especially pyrite, chalcopyrite, galena, and sphalerite. Gold, silver, and rare-earth minerals occur with barite in some deposits in the western United States. Barite is also a gangue mineral in metallic ore deposits but production as a by-product from such deposits is affected by many economic factors.

The host rocks are igneous, sedimentary, and metamorphic rocks of Precambrian to Tertiary age. Many deposits in the western States are associated with Tertiary igneous rocks, although notable exceptions are the deposits associated with Precambrian igneous in the Wet Mountains, Custer County, Colo., and in the Mountain Pass district, San Bernardino County, Calif. Deposits in rocks of Mesozoic age are not common. The barite in veins in most eastern and midwestern deposits is not directly associated with igneous rocks; these deposits are considered precipitates from low-temperature hydrothermal solutions.

The grade of the ore varies greatly within any one deposit and from deposit to deposit. It is impossible to cite an average ore-grade for this group of deposits.

Bedded deposits. In bedded deposits barite is restricted to certain beds or a sequence of beds in sedimentary rocks. Commercially important deposits of this type contain fine-grained, massive gray barite or abundant crystals and masses of barite with quartz, chert, and carbonates such as calcite, dolomite, siderite, strontianite, and witherite. Pyrite and secondary iron oxides are common. The barite-rich beds generally form lenticular ore bodies that may pinch out abruptly or gradually diminish in barite content both horizontally and vertically. The thickness of the ore body may be as great as 200 feet; the length more than one mile; and the width one-half mile.

Bedded deposits occur almost exclusively in rocks of late Paleozoic age. Deposits have been mined in Carboniferous rocks in Arkansas, California, Idaho, and Nevada. Some bedded deposits in Nevada occur in Ordovician and Devonian rocks. In a unique group of deposits in Howard County, Ark., barite locally cements the basal gravels of the Trinity Group of Early Cretaceous age.

Evidence for the origin of bedded deposits is conflicting: the barite originated either as a primary deposit or as a replacement of the host rock from aqueous solution.

The grade of ore varies from bed to bed, and may be as great as 90 percent barite. Rock containing 30 percent barite or having a specific gravity 3.2 is considered minimum grade for beneficiation by flotation methods.

Residual deposits. Residual deposits occur in unconsolidated material that formed by the weathering of preexisting deposits. They are abundant in Missouri, Tennessee, Georgia, Virginia and Alabama, where the deposits are in residuum from limestone and dolomite of Cambrian and Ordovician age.

Most of the barite is white and translucent to opaque. It occurs chiefly as mammillary, fibrous, or dense, fine-grained masses 1 to 6 inches across and less commonly as subhedral to euhedral crystals. Some pyrite, galena, and sphalerite may occur with the barite. The remainder of the material in these deposits is chert, quartz, and rock fragments in a matrix of red to brown clay.

The size and shape of the ore bodies vary greatly because they are dependent in part upon the nature of the original deposit. The barite is either disseminated randomly or concentrated in irregular runs or streaks at various intervals in the residuum. In Missouri, the deposits generally are within 15 feet of the surface; in Georgia, some deposits are as deep as 150 feet beneath the surface.

The grade of ore in residual deposits varies greatly because of the nature of the original deposit and the degree of concentration of the barite in the residuum. Many residual deposits contain an average of 12 to 20 percent barite, but the grade of ore is commonly expressed in terms of pounds of barite recovered per cubic yard of residuum processed at washer plants. The recovery of 150 pounds of barite per cubic yard is considered a minimum grade for a profitable operation.

Index

Locality	Lat. N.	Long. W.
ALABAMA		
(Principal reference: Adams and Jones, 1940)		
1. Sinks district. Residual deposits in Ordovician limestone.	33°02'	87°01'
2. Longview-Saginaw district. Residual deposits in Ordovician limestone.	33°13'	86°47'
3. Vincent–Harpersville–Wilsonville district. Residual deposits in Ordovician limestone.	33°25'	86°27'
4. Leeds area. Residual deposits in Ordovician limestone.	33°32'	86°37'
5. Beaver Creek Valley-Greens Valley area. Residual deposits in Ordovician limestone.	33°54'	85°59'
6. Angel Station district. Residual deposits in Cambrian and Ordovician dolomite.	33°52'	85°50'
7. Southern Cleburne County area. Veins in Precambrian mica schist.	33°31'	85°31'
8. Southeastern Cherokee County area. Veins in Cambrian rocks.	33°58'	85°26'
ARIZONA		
(Principal reference: Stewart and Pfister, 1960)		
1. Ramirez property. Vein along fault in Morita Formation of Bisbee Group.	31°34'	109°57'
2. Hopeful claim. Gash vein in limestone of the Pennsylvanian Horquilla Limestone of the Naco Group.	31°32'	110°01'

Locality	Lat. N.	Long. W.
ARIZONA-Cont'd		
3. Johnnie Boy No. 1. Vein in limestone.	31°53'	109°56'
4. Ground Hog mine. Veins in fault zone.	31°40'	110°05'
5. Top Hat group. Veins in fault zone in Precambrian schist.	34°00'	111°10'
6. Lone Pine claim. Veins in Precambrian metavolcanic rocks.	33°55'	111°23'
7. Gisela deposit. Veins in rocks of Precambrian age.	34°08'	111°16'
8. Gilmore Spring prospect. Veins in Precambrian greenstone.	34°09'	111°19'
9. Grey Fox group. Veins in Precambrian diorite.	34°09'	111°21'
10. Zulu and Green Valley prospects. Veins in Precambrian metavolcanic rocks.	34°09'	111°13'
11. Baronite group. Veins in coarse-grained Precambrian granite.	34°12'	111°13'
12. Marcotte group. Veins in Cretaceous or Tertiary volcanic agglomerate.	32°44'	110°09'
13. Graham prospect. Veins.	32°43'	110°07'
14. Barium King group. Veins.	33°05'	110°20'
15. Little Mule group. Veins in diorite porphyry.	33°01'	110°22'
16. Coronado group. Veins in Carboniferous limestone.	33°03'	110°25'
17. Macco (Arizona Barite) mine. Veins. Wilson and Roseveare, 1949.	33°33'	111°39'
18. Princess Ann (Fay L.) deposit. Veins in volcanic rocks of Cretaceous to Tertiary age.	33°44'	113°17'
19. White Rock claims. Veins in basalt.	33°44'	113°17'
20. B & H No. 6 claim. Veins in Precambrian schist.	33°15'	112°52'
21. Rowley mine. Veins in andesite.	33°03'	113°02'
22. Rucker group. Veins in Precambrian granite.	35°09'	113°31'
23. White Prince claim. Veins in limestone and andesite.	32°07'	112°11'
24. Quijotoa mine. Veins in andesite.	32°07'	112°10'
25. Heavy Boy group. Veins along fault in Mississippian limestone.	32°03'	110°38'
26. Gonzales Pass deposit. Veins in Precambrian Pinal Schist.	33°15'	111°14'
27. MGM claims. Filling in breccia zone between granite of Precambrian age and volcanic breccia.	34°01'	112°37'

Locality	Lat. N.	Long. W.
ARIZONA-Cont'd		
28. French Creek deposit. Veins in fault zone in Precambrian schist.	34°05'	112°24'
29. White Spar claim. Veins in Precambrian diorite.	34°25'	112°32'
30. Bouse district. Veins in volcanic rocks of Cretaceous or Tertiary age.	33°54'	114°05'
31. Keiser deposit. Veins in volcanic rocks of Cretaceous age.	33°46'	114°04'
32. Ernest Hall property. Veins in Precambrian schist and gneiss. Wilson and Roseveare, 1949.	33°53'	113°40'
33. Sterling No. 1. Vein in quartz diorite.	33°54'	113°37'
34. Norps group. Veins in Precambrian granite gneiss.	33°44'	113°22'
35. Nottbusch mine. Veins in schist. Wilson, 1933.	33°05'	113°47'
36. Renner mine. Veins in fault zone in granitic gneiss. Wilson, 1933.	32°45'	113°45'
37. Silver King claim. Veins in fault zones in volcanic rocks of Cretaceous or Tertiary age. Wilson, 1933.	33°07'	114°35'
ARKANSAS		
(Principal reference: Scull, 1958)		
1. Bear Creek prospect. Residual deposit in Mississippian and Pennsylvanian shales. Jones, 1948.	34°14'	93°41'
2. Bee Mountain, Boar Tusk Mountain, and Two Mile Creek prospects. Bedded deposits in novaculite of Devonian and Mississippian age. Jones, 1948.	34°30'	94°17'
3. Boone Springs Creek, Fancy Hill, Gap Mountain, Polk Creek Mountain, and Sulphur Mountain prospects and mines. Bedded deposits in novaculute of Devonian and Mississippian age, and shale of Mississippian and Pennsylvanian age. Jones, 1948; McElwaine, 1946b.	34°22'	93°46'
4. Cossatot River prospect. Bedded deposit in novaculite of Devonian and Mississippian age. Jones, 1948.	34°24'	94°13'
5. Magnet Cove area. Bedded deposit in shale of Mississippian and Pennsylvanian age. McElwaine, 1946a; Parks, 1932.	34°28'	92°49'
6. Mill Creek-Pigeon Roost Mountain area. Bedded deposits in	34°21'	93°13'

Locality	Lat. N.	Long. W.
ARKANSAS-Cont'd		
shale of Mississippian and Pennsylvanian age. Jones, 1948.		
7. Viles Creek area. Bedded deposits in novaculite of Devonian and Mississippian age and shale of Mississippian and Pennsylvanian age. Jones, 1948.	34°21'	93°56'
8. Dierks area. Bedded deposits in Cretaceous gravels. Scull, 1958.	34°09'	93°56'
CALIFORNIA		
1. Afterthought prospects and Austin quarry. Veins in Tertiary mafic igneous rocks. Averill, 1939.	40°47'	122°14'
2. Almanor district. Bedded deposits in upper Paleozoic quartzite limestone. Averill and Norman, 1951.	40°09'	121°07'
3. Beegum Creek prospects. Veins. Bradley, 1930.	40°22'	122°53'
4. Barstow area. Veins in metamorphic rocks of pre-Cretaceous age and in sedimentary and volcanic rocks. Durrell, 1954; Wright and others, 1953.	34°55'	116°55'
5. Bidwell ranch prospect and Exposed Treasure claims. Veins in Tertiary(?) diorite. Averill, 1939; Bradley, 1930.	40°56'	121°59'
6. Democrat mine. Bedded replacement deposit. Bradley, 1930; Logan, 1941.	39°40'	120°48'
7. El Portal and Egenhoff mines. Bedded deposit in slate, phyllite, and schist of late Paleozoic age. Fitch, 1931.	37°40'	119°48'
8. Gabilan (Fremont) Peak area. Bedded deposit in silicified limestone with dolomite. Bradley, 1930.	36°47'	121°32'
9. Glidden Company (Loftus) area. Bedded deposit in slate and limestone of Devonian or Carboniferous age. Averill, 1939.	41°09'	122°15'
10. Gunter Canyon area. Veins in Cambrian slate and schist. Bradley, 1930.	37°28'	118°15'
11. Hanson mine. Veins in sedimentary and volcanic rocks of Tertiary age. Durrell, 1954.	34°45'	116°10'
12. La Brea area (Eagle mine). Vein in sandstone. Bradley, 1930.	34°56'	120°06'
13. Liscom Hill area. Vein. Bradley, 1930.	40°55'	123°57'

Locality	Lat. N.	Long. W.
CALIFORNIA-Cont'd		
14. Mountain Pass district. Veins in Precambrian metamorphic and igneous rocks. Olson and others, 1954; Zadra and others, 1952.	35°30'	115°30'
15. Poso Baryta area. Veins in Jurassic quartz diorite. Tucker and Sampson, 1938.	35°51'	118°04'
16. Red Hill area. Veins in Tertiary sandstone. Bradley, 1930.	33°45'	117°47'
17. San Dimas Canyon area. Bedded deposit. Winston, 1949; Bradley, 1930.	34°12'	117°45'
18. Spanish mine. Bedded deposit in slate of late Paleozoic age. Logan, 1941.	39°25'	120°47'
19. Warm Springs Canyon area. Vein. Tucker and Sampson, 1938.	35°59'	116°55'
20. Joy group. Veins in volcanic rocks.	34°24'	114°17'
COLORADO		
1. Hartsel area. Veins in limestone of Permian and Pennsylvanian age. Howland, 1936.	39°02'	105°48'
2. Wet Mountains area. Veins along shear zones in Precambrian igneous and metamorphic rocks. Christman and others, 1953.	38°10'	105'15'
3. Sunshine Canyon area. Vein in Precambrian granite. Argall, 1949.	40°05'	105°23'
CONNECTICUT		
1. Cheshire area. Veins in Triassic sandstone and arkose. Harte, 1945; Hill, 1917.	41°29'	72°54'
GEORGIA		
(Principal reference: Hull, 1920)		
1. Kingston and Bass Ferry prospects. Residual deposits in dolomite of Cambrian and Ordovician age.	34°17'	84°56'
2. Cartersville district. Residual deposits in Cambrian dolomite. Kesler, 1950.	34°10'	84°47'
3. Eton district and Ruralvale areas. Residual deposits in limestone and dolomite of Cambrian and Ordovician age.	34°48'	84°47'
4. Plainville area. Residual deposits in Cambrian limestone.	34°23'	85°03'
5. Stilesboro prospect. Residual deposits in Cambrian and Ordovician dolomite.	34°06'	84°57'

Locality	Lat. N.	Long. W.

GEORGIA-Cont'd

Locality	Lat. N.	Long. W.
6. Waleska area. Bedded replacement deposit in Precambrian quartzite.	34°17'	84°34'

IDAHO

Locality	Lat. N.	Long. W.
1. Meyers Cove area. Veins with fluorite and stibnite in Permian and Tertiary volcanic rocks. Cox, 1954.	44°50'	114°30'
2. Sun Valley mine. Bedded deposit in sandstone, shale, and limestone, all of Pennsylvanian age. Kiilsgaard, 1950.	43°32'	114°29'

ILLINOIS

Locality	Lat. N.	Long. W.
1. Kentucky-Illinois fluorspar district. Vein and bedded-replacement deposits along faults in Mississippian limestone. Bastin, 1931; Williams and Duncan, 1955; Bradbury, 1959.	37°10' to 37°25' and 37°38'	87°52' to 88°42' and 88°10'

KENTUCKY

Locality	Lat. N.	Long. W.
1. Central district. Veins and breccia filling in Ordovician limestone, shale, and sandstone. Robinson, 1931.	38°26' to 37°35' and 37°55' to 38°00'	85°00' to 84°21' and 84°05' to 85°03'
2. Western Kentucky fluorspar district. Vein and bedded replacement deposits along faults in Mississippian limestone, shale, and sandstone. Williams and Duncan, 1955.	(See Illinois)	

MARYLAND

Locality	Lat. N.	Long. W.
1. Johnsville mine. Bedded lens in Cambrian limestone. Ostrander, 1942.	39°31'	77°14'
2. Sauble quarry. Veins in Cambrian limestone. Watson and Grasty, 1915.	39°20'	77°25'

MISSOURI

Locality	Lat. N.	Long. W.
1. Central district. Residual and some vein deposits in dolomite and limestone of Ordovician and Mississippian age. Mather, 1946, 1947.	37°45' to 39°05'	92°15' to 93°15'
2. Graniteville area. Vein in Precambrian granite. Tarr, 1932.	37°39'	90°41'
3. Houston mine. Collapse breccia filling in Ordovician dolomite. Kidwell, 1946.	37°15'	92°02'

MISSOURI-Cont'd

Locality	Lat. N.	Long. W.
4. Southeastern district. Residual deposits in Cambrian dolomite. Dake, 1930; Tarr, 1918, 1919, 1932.	38°00 to 38°30'	90°40' to 91°00'

MONTANA

(Principal reference: DeMunck and Ackerman, 1958)

Locality	Lat. N.	Long. W.
1. Greenough area. Veins in Precambrian Belt Series and in upper Mesozoic or Tertiary intrusive igneous rocks.	46°53'	113°23'
2. Pattee Canyon area. Veins with specular hematite in Precambrian Belt Series. Rowe, 1928.	46°49'	113°59'
3. Rattlesnake Creek area. Veins with specular hematite in Precambrian Belt Series. Rowe, 1928.	46°55'	114°00'
4. Indian Head Rock area. Veins in volcanic rocks.	46°17'	112°17'
5. Stevensville area. Lenses and veins in Precambrian Belt Series.	46°29'	113°57'
6. Packer Creek area. Veins with limonite and galena. Calkins and Jones, 1914.	47°26'	115°32'
7. Whaley area. Veins in Precambrian Belt Series.	46°41'	113°59'
8. Copper Mountain area. Veins in Precambrian Belt Series.	48°22'	115°55'
9. Shook prospect. Veins in gneissic rocks.	45°34'	114°21'
10. Fletcher prospect. Veins in Precambrian Belt Series.	44°46'	111°45'
11. Lucky Boy prospect. Veins in sedimentary rocks of probable Precambrian age.	46°43'	113°26'
12. Northern Pacific prospect. Veins in Precambrian Belt Series.	46°40'	113°40'

NEVADA

(Principal references: Horton, 1963, and Gianella, 1940)

Locality	Lat. N.	Long. W.
1. Jungo group. Veins in Paleozoic limestone.	41°40'	114°45'
2. Rytting mine. Veins in limestone.	41°10'	114°38'
3. Wildcat mine. Veins in argillite.	41°42'	115°20'
4. 76 Creek prospect. Veins.	41°41'	115°27'
5. Prunty prospect. Veins.	41°40'	115°25'
6. Anacabe prospect. Bedded deposit.	41°15'	116°08'

Locality	Lat. N.	Long. W.
NEVADA-Cont'd		
7. Gaylord prospect. Bedded deposit.	41°12'	116°08'
8. Joan Laura prospect. Bedded deposit.	41°12'	116°08'
9. Estabrook mine. Bedded deposit.	41°09'	116°20'
10. Jones Marvel. Bedded deposit.	41°08'	116°11'
11. Rossi mine. Bedded deposit.	41°05'	116°25'
12. Big Three prospect. Veins.	40°58'	116°07'
13. Heavy Spar prospect. Bedded deposit.	40°56'	116°07'
14. Maggie Creek mine. Bedded deposit.	40°48'	116°14'
15. Pine Mountain prospect. Veins.	40°31'	116°04'
16. Snow White prospect. Veins.	40°31'	115°59'
17. Unnamed prospect. Veins.	40°25'	115°58'
18. Unnamed prospect. Veins in carbonate rock.	40°20'	116°02'
19. Alpha prospect. Veins.	40°01'	116°06'
20. Argenta and Shelton mines. Bedded deposit.	40°41'	116°44'
21. Section 31 prospect. Bedded deposit.	40°36'	116°43'
22. Section 18 prospect. Bedded deposit.	40°33'	116°43'
23. Slaven Canyon (Pleasant View) mine. Bedded barite in Slaven Chert of Devonian age.	40°30'	116°46'
24. Bateman Canyon mine. Bedded barite in chert of Devonian age.	40°29'	116°49'
25. Lancaster-Caudle group. Veins in shale.	40°26'	116'51'
26. Starr Grove prospect. Vein.	40°26'	116°52'
27. White Rock mine. Bedded deposit.	40°24'	116°44'
28. King Gulch prospect. Vein.	40°21'	116°43'
29. Greystone mine. Bekded barite in chert of Devonian age.	40°16'	116°52'
30. Mountain Springs mine. Bedded deposit.	40°19'	117°03'
31. Bald Mountain prospect. Bedded deposit.	40°02'	116°41'
32. Laurent mine (Reese River district). Vein.	39°26'	116°57'
33. Timber Canyon prospect. Vein. R. J. Roberts, oral communication, 1954.	40°35'	117°14'
34. Sugar Loaf prospect. Vein.	40°37'	117°25'
35. Sander's mine. Veins.	41°06'	117°18'

Locality	Lat. N.	Long. W.
NEVADA-Cont'd		
36. Tomlinson-Mullinix prospect. Bedded barite in rocks of Cambrian and Ordovician age. Approximate location.	40°52'	117°44'
37. Getchell prospect. Bedded barite in rocks of Cambrian and Ordovician age.	41°13'	117°17'
38. Yerrington mine. Veins.	39°08'	119°39'
39. Highland group. Veins.	39°02'	118°15'
40. Gravity mine. Veins.	38°49'	118°38'
41. Crystal Barite mine. Veins in the Triassic(?) Excelsior Formation.	38°33'	118°25'
42. Cowden-Knowles prospect.	38°24'	118°09'
43. Annett group. Veins.	38°14'	118°17'
44. Noquez Barium mine. Veins.	38°12'	118°07'
45. Candelaria mine. Veins.	38°09'	118°04'
46. Little Summit mine. Veins in the Ordovician Palmetto Formation.	38°08'	118°13'
47. Little Mountain prospect.	38°07'	118°24'
48. B and L mine.	37°59'	118°18'
49. Barite King and Queen group. Veins in limestone.	38°01'	118°10'
50. American Barite mine. Veins.	37°54'	117°29'
51. Summit Creek mine. Bedded deposit.	39°01'	117°15'
52. Northumberland prospect.	38°57'	116°50'
53. Warm Springs mine. Bedded deposit.	38°12'	116°24'
54. Jumbo mine. Bedded deposit.	38°04'	116°42'
55. Lucky Boy prospect.	37°21'	114°27'
56. Lagarto prospect. Veins.	36°01'	114°50'
57. Klinger prospect. Veins.	35°59'	114°59'
58. Goodsprings district. Veins.	35°50'	115°26'
59. Bear mine. Bedded deposit.	40°06'	116°02'
60. Congress prospect. Bedded deposit.	37°38'	117°15'
NEW MEXICO		
(Principal reference: Clippinger, 1949)		
1. American fluorspar group. Veins in sedimentary rocks of Pennsylvanian age.	33°01'	106°40'
2. Derry district. Vein. Northrop, 1942.	32°48'	107°08'
3. Bear Canyon district. Bedded deposit in limestones of Ordovician and Silurian age. Dunham, 1935.	32°16'	106°33'

Locality	Lat. N.	Long. W.
NEW MEXICO-Cont'd		
4. Dewey mine. Vein in Precambrian gneiss.	34°16'	106°48'
5. Gallinas district. Veins in sedimentary rocks of Permian age and in sills and dikes of Tertiary age. Rothrock and others, 1946.	34°15'	105°45'
6. Gonzales prospect. Veins in Precambrian granite and in Pennsylvanian and Permian sedimentary rocks.	34°05'	106°50'
7. Hansonburg district. Veins in sedimentary rocks of Pennsylvanian and Permian age. Kottlowski, 1953.	33°49'	106°22'
8. Palm Park mine. Veins in brecciated rhyolite sill of Tertiary age.	32°45'	107°07'
9. Tonuco Mountain area. Veins in Precambrian metamorphic and igneous rocks.	32°37'	106°58'
10. Vincent Moore claim. Vein in limestone.	35°02'	106°14'
NORTH CAROLINA		
1. Hillsboro district. Veins in Precambrian metamorphosed tuff. Stuckey and Davis, 1935.	36°02'	79°06'
2. Hot Springs district. Veins and lenses in Precambrian rocks. Stuckey, 1942; Oriel, 1950.	35°53'	82°50'
3. Kings Mountain-Gaffney district. Veins in Precambrian granite and schist. Van Horn and others, 1949.	35°02' to 35°13'	81°29' to 81°17'
OKLAHOMA		
(Principal reference: Ham and Merritt, 1944)		
1. Cache prospect. Residual deposit in Permian shale.	34°35'	98°35'
2. Manitou prospect. Residual deposit in Permian rocks.	34°31'	98°50'
3. Mills Creek area (Thompson ranch prospect). Residual deposits in Cambrian and Ordovician limestone.	34°28'	96°46'
4. Watson prospects. Veins in Mississippian and Pennsylvanian quartzite.	34°26'	94°32'
5. Lowrance ranch area. Residual deposits in Cambrian and Ordovician limestone.	34°27'	96°56'
PENNSYLVANIA		
1. Buckmanville area. Vein deposits. Stone, 1939.	40°18'	74°58'

Locality	Lat. N.	Long. W.
PENNSYLVANIA-Cont'd		
2. Chambersburg area. Residual deposits in Cambrian and Ordovician limestone. Stone, 1939.	39°55'	77°40'
3. Fort Littleton area. Residual deposit in Cambrian and Ordovician limestone. Stone, 1939.	40°05'	77°58'
4. Waynesboro area. Residual deposits in Cambrian limestone. Watson and Grasty, 1915.	39°47'	77°32'
SOUTH CAROLINA		
1. Kings Creek district. Veins in Precambrian granite and schist. Van Horn and others, 1949; McCauley, 1962.	35°02' to 35°13'	81°29' to 81°17'
TENNESSEE		
1. Del Rio district. Veins in Precambrian and Cambrian rocks. Ferguson and Jewell, 1951.	35°55'	83°00'
2. Fall Branch district. Residual deposits in Cambrian and Ordovician rocks. Laurence, 1938; Rankin and others, 1938.	36°25'	82°37'
3. Greene County area. Residual deposits in Cambrian and Ordovician rocks. Gordon, 1920.	36°10'	82°50'
4. Lost Creek district. Residual deposits in Ordovician limestone. Gildersleeve, 1946.	36°20'	83°50'
5. Middle Tennessee area. Veins in Ordovician limestone. Jewell, 1947.	35°42' to 36°27'	85°45' to 86°43'
6. Pall Mall district. Residual deposits in Mississippian limestone. Rankin and others, 1938.	36°33'	84°58'
7. Sweetwater district. Residual deposits in Cambrian and Ordovician rocks. Gordon, 1918; Laurence, 1939, 1960; Rankin and others, 1938.	35°36'	84°28'
TEXAS		
1. Freeman ranch area. Veins in Precambrian metamorphic rocks. Zapp, 1941.	30°54'	98°44'
2. Henry Mills ranch area. Veins and cavern fillings in Cretaceous limestone. Evans, 1943.	30°05'	101°25'
3. Seven Heart Gap area. Bedded deposits and veins in Permian limestone. Evans, 1943.	31°20'	104°30'
4. Van Horn area. Veins in lower Paleozoic limestones. Evans, 1943.	31°05'	104°50'

Locality	Lat. N.	Long. W.
UTAH		
1. Cottonwood-American Fork district. Veins in Cambrian quartzite. Butler and Loughlin, 1916.	40°36'	111°35'
2. Argenta district. Bedded deposits in Cambrian limestone. Hill, 1917.	41°11°	111°45'
3. Wasatch Range. Veins in Precambrian granite gneiss. Hill, 1917.	41°10'	111°50'
VIRGINIA		
(Principal reference: Edmundson, 1938)		
1. Bedford County area. Veins and tabular bodies in Precambrian granite.	37°22'	79°39'
2. Campbell-Pittsylvania Counties area. Vein and residual deposits in Precambrian metamorphic rocks. Espenshade, 1952.	37°23' to 36°56'	79°05' to 79°35'
3. Fauquier County area. Veins in Triassic shales.	38°35'	77°38'
4. Grayson County area. Residual and vein deposits in Precambrian granodiorite gneiss. Stose and Stose, 1957.	36°45'	81°08'
5. Roanoke-Botetourt Counties area. Residual deposits in Ordovician limestone. Espenshade, 1952.	37°29'	79°58'
6. Russell-Tazewell Counties area. Residual, vein, and bedded replacement deposits in Ordovician limestone.	36°56' to 37°08'	82°05' to 81°32'
7. Smyth County area. Residual and vein deposits in limestone.	36°49'	81°33'
WASHINGTON		
(Principal references: Valentine, 1949; Moen, 1964)		
1. Maple Creek prospect. Lens in volcanic rocks and Eocene limestone and argillite. Park, 1942.	47°36'	123°10'
2. Northern Stevens County area. Veins in Paleozoic sedimentary rocks, in Mesozoic intrusive igneous rocks, and in Miocene volcanic rocks.	48°44'	117°55'
3. Springdale area. Veins in Paleozoic sedimentary rocks, in Mesozoic intrusive igneous rocks, and in Miocene volcanic rocks.	48°07'	118°00'
4. Lead Hill prospect. Veins.	48°57'	117°12'
5. Lead Horse and Peacock claims. Veins.	48°48'	120°20'
6. Congress mine. Contact deposit between gabbro and metasedimentary rocks.	48°13'	118°37'
WISCONSIN		
1. Cuba City area. Veins in Ordovician dolomite, shale, and limestone. Agnew and others, 1954.	42°33'	90°20'

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