VOLUME 40, No. 5
MAY 1978

THE ORE BIN

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

The Ore Bin

Published Monthly
by
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 97201
Telephone: [503] 229-5580

FIELD OFFICES
2033 First Street 521 N.E. "E" Street
Baker 97814 Grants Pass 97526

MINED LAND RECLAMATION DIVISION
1129 S.E. Santiam Road
Albany 97321

Subscription Rates

1 year, $3.00; 3 years, $8.00
Available back issues: $.25 at counter, $.35 mailed
Second class postage paid at Portland, Oregon

State of Oregon
Department of Geology
and Mineral Industries
1069 State Office Bldg.
Portland, Oregon 97201

The ORE BIN
Volume 40, No. 5
May 1978

OVERVIEW OF THE BOHEMIA MINING DISTRICT

J. J. Gray, Economic Geologist
Oregon Department of Geology and Mineral Industries

This is the third in a series of four articles on mineralization in the Western Cascades. The first, a field trip guide to the Quartzville mining district, appeared in June 1977. The second, printed in December, discussed the history, geology, stratigraphy, and mineralization of 14 Western Cascade mining areas. This article focuses on the major area, the Bohemia mining district; and a field trip guide to Bohemia will be published in next month's (June) Ore Bin.

The Bohemia district was selected for detailed study in the series because it is the largest and most productive mining area in the Western Cascades. All facets of Western Cascades mineralization are represented in the district.

Checkpoints mentioned in both this and next month's articles refer to locations on the centerfold map.

Location and Geography

The Bohemia mining district (see map, centerfold) lies about 35 mi southeast of Cottage Grove in Lane County (Tps. 22 and 23S; Rs. 1 and 2E). The roughly circular mineralized area is about 5 mi in diameter. From Cottage Grove, access to the district is by Row River Road and Forest Service roads which follow Sharps and Brice Creeks. The district lies at the southern limits of the Willamette Valley, where the east-west-trending Calapooya Mountains separate drainages of the Willamette and Umpqua Rivers. The Bohemia district is on the eastern part of the divide, in an area characterized by high, rugged summits and steep, heavily timbered slopes (Figure 1).

Narrow ridges and valleys radiate from the central part of the district. Elevations range from just under 2,000 ft on Champion Creek on the edge of the district to 5,933 ft on Fairview Peak located near the center. The area is drained by tributaries of Brice and Sharps Creeks on the Willamette side of the divide and by Steamboat Creek tributaries on the Umpqua side. Glaciation helped shape the upper mountain heights; glaciers moved down the valleys, leaving debris and forming cirques (deep, steep-walled, bowl-shaped valleys). Some of the cirques now contain lakes or bogs. Champion Creek begins in a cirque (checkpoint 55).

Geology

The Bohemia area is underlain by Oligocene and early Miocene volcanic rocks of the Little Butte Volcanic Series which have been intruded by

Figure 1. Panoramic view taken through arc of 165° in a northerly direction from summit of North Grouse Mountain, in Bohemia district. Note many of the characteristic surface features of the Western Cascades. A rough accordance of ridge tops may be noted. Noonday Ridge is typical of the long ridges sloping toward the valleys of major streams. In the center, short ridges slope gently, then break off abruptly into the very narrow valley of Champion Creek. Glacial cirques are visible in the area between Bohemia Mountain and Fairview Peak and on the east slope of Fairview Peak (Callaghan and Buddington, 1938).

late Miocene and early Pliocene rocks. All rock types have been subjected to alteration, mineralization, and faulting. For a more detailed discussion of geology and mineralization, see the December 1977 Ore Bin.

Volcanic, sedimentary, and intrusive rocks

Layered rock units exposed in the district consist of about 4,000 ft of lapilli tuff; tuff breccia; flows and domes of basalt, andesite, dacite, and rhyolite; and minor amounts of tuff, tuffaceous shale and sandstone (Figure 2), and conglomerate.

A 1,000-ft section of lapilli tuff and tuff breccia is exposed from halfway between checkpoints 25 and 26 to checkpoint 27. Another section of these rocks occurs between checkpoints 61 and 62. Tuffaceous shale and sandstone is exposed between checkpoints 27 and 31. A conglomerate with subrounded boulders of various types of volcanic rock up to 10 ft in diameter occurs at checkpoint 62 (Figure 3). Other volcanic features exposed in the district include part of a dome at checkpoint 33, prophyritic basalt flow between checkpoints 39 and 40, and another lava flow on the south side of the fault at checkpoint 61.

The youngest intrusive rocks are porphyritic dacites; the next older are andesitic and basaltic dikes and sills; and the oldest intrusions are granitoid, ranging in composition from diorite to granite. Granodiorite, the most common type of granitoid rock, occurs at checkpoints 43, 52, and 53. Porphyritic dacite is exposed at checkpoint 58, an andesite sill at checkpoint 28, and an andesite dike at checkpoint 29.

Alteration

All types of rock alteration discussed in the December 1977 Ore Bin can be seen along the route to and through the Bohemia mining district. Low-grade zeolite alteration occurs outside the district at checkpoints 12 and 15. All rocks within the district show a moderate degree of propylitic alteration as an alteration "background."

The boundary between propylitic alteration and contact metamorphism within the Bohemia district is not easily identified. Near the edges of the district, rocks have been propylitically altered, as shown by the presence of chlorite and epidote in rocks at checkpoints 29, 60, and 61. The

Figure 2. Thin-bedded tuffaceous shale and sandstone (checkpoint 28).

Figure 3. Conglomerate of volcanic pebbles, cobbles, and boulders up to 10 ft in diameter, found in stream bed at checkpoint 62.

alteration also hardened these rocks, so that they now form resistant outcrops (checkpoints 51 and 60). Near the intrusive contact, albite-epidote and tourmaline hornfels occur (checkpoint 38).

Alteration caused by hydrothermal action is discussed in the next section.

Veining

The 100 known veins within the district have open-space fillings of quartz, complex sulfides, and other minerals. Associated with the veining is hydrothermal alteration of the country rock.

Veins crop out at checkpoints 32, 36, and 42. The vein mineralization is zoned. Copper, lead, and zinc sulfide minerals with quartz and specular hematite occur in the center of the district. Minerals found at the Musick mine dump (checkpoint 40) and the Champion mine dump (checkpoint 55) are typical of this zone; they include comb quartz, pyrite, chalcopyrite, specularite, sphalerite, and galena (Figure 4).

Veins in the zone surrounding the center also contain the same minerals except the specularite. Stibnite-bearing veins (checkpoint 32) on the south side of the district characterize the outer zone.

Along with vein mineralization, large areas such as that along Hard-

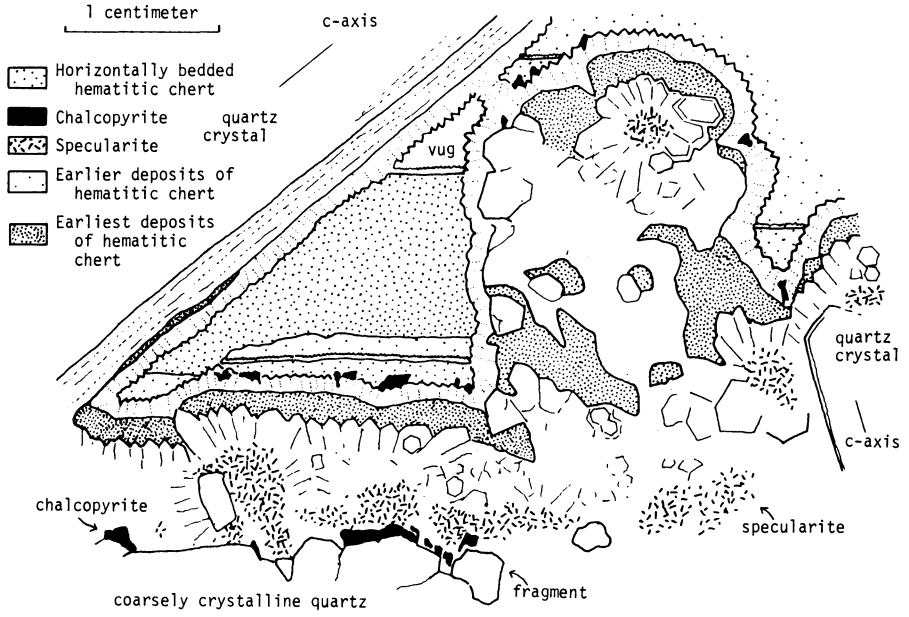


Figure 4. Sketch of photomicrograph of specimen containing horizontally (?) bedded hematitic chert (dotted) with contemporaneous chalcopyrite filling vugs in coarsely crystalline quartz. Earliest deposits are medium-grained quartz and specularite, followed by a layer of hematitic chert. Later deposits include alternating layers of hematitic chert and fine comb quartz. About 5 percent chlorite accompanies hematite and chert in the upper layer (after Lutton, 1962).

scrabble Road between checkpoints 24 and 27 have been silicified and pyritized. Rocks in these areas are bleached and iron stained.

Structure

Structure in the Bohemia area includes faults, breccia zones, a broad warp, and a few minor folds. The warping and the folds are not apparent without much study; checkpoint 47, however, does show a breccia zone; and faults can be found at checkpoints 15 and 61. Veining follows the faulting-fracturing system, but most of the vein-faults do not indicate much displacement.

Mineral and Fossil Localities

Minerals listed in Table 1 are typical of the district and, with the exception of gold, are relatively easy to find at the indicated locations.

Table 1. Mineral compositions and localities in the Bohemia district

Mineral	Composition	Checkpoint numbers*
Calcite	$CaCO_3$	12, 15
Chalcopyrite	$CuFeS_2$	40, 55
Epidote (Figure 5)	$Ca_2(Al,Fe)_3Si_3O_{12}(OH)$	39, 40, 58, 61, 62
Galena	PbS	40, 55
Gold	Au	40, 55
Hematite	Fe_2O_3	36, 40, 55
Magnetite	Fe_3O_4	61, 62
Pyrite	FeS_2	18 through 63
Quartz (Figures 6, 7)	SiO_2	15, 30, 36, 40, 44, 55
Sphalerite	ZnS	40, 55
Stibiconite (Figure 6)	$H_2Sb_2O_5$	32
Stibnite (Figures 6, 8)	Sb_2S_3	32
Tourmaline (Figure 9)	$Na(Mg,Fe)_3Al_6(BO_3)_3(Si_6O_{18})(OH)_4$	38, 40, 58

*See map, centerfold

The fossil suite found at the Rujada locality (checkpoint 73) contains 40 different types of plant life. The Oligocene fossils, mainly leaves and cones (Figure 10), are described in detail by Lakhanpal (1958).

History

The Bohemia district surpasses all mining districts of the Western Cascades in area, number of producing properties, amount of development work, and total production. In 1858, placer gold was discovered on Sharps Creek (checkpoint 11) by W.W. Oglesby and Frank Brass. The following year, values were found and recovered from Sailor's (or Saylor's) Gulch (checkpoint 22). In 1863, lode gold was found by George Ramsey and James (?) Johnson within three-quarters of a mile of Bohemia Mountain. Soon prospectors began arriving in the area, and because Johnson, from the country of Bohemia, was nicknamed "Bohemia" Johnson, the district was named Bo-

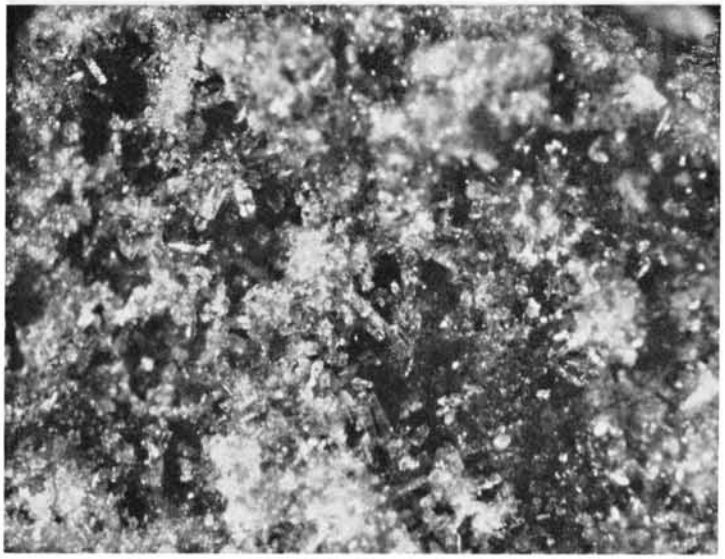


Figure 5. Photomicrograph of epidote knots found at checkpoint 61. Crystals are epidote; black material is fine-grained magnetite. (X30) (Photo courtesy Larry Brown)

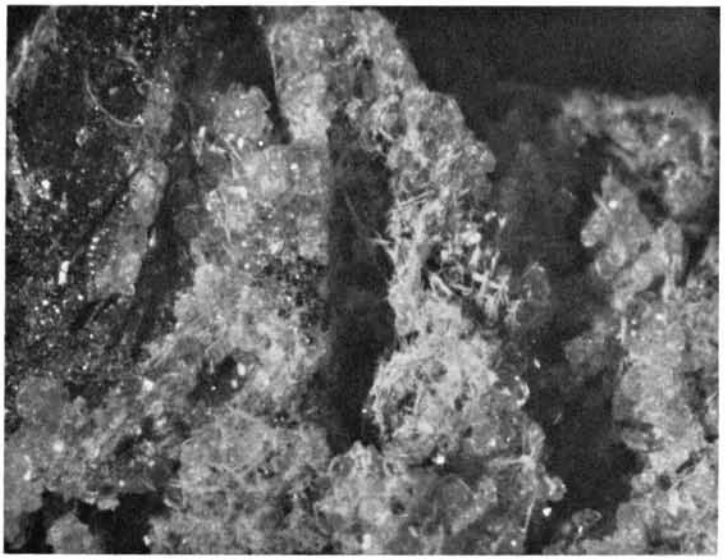
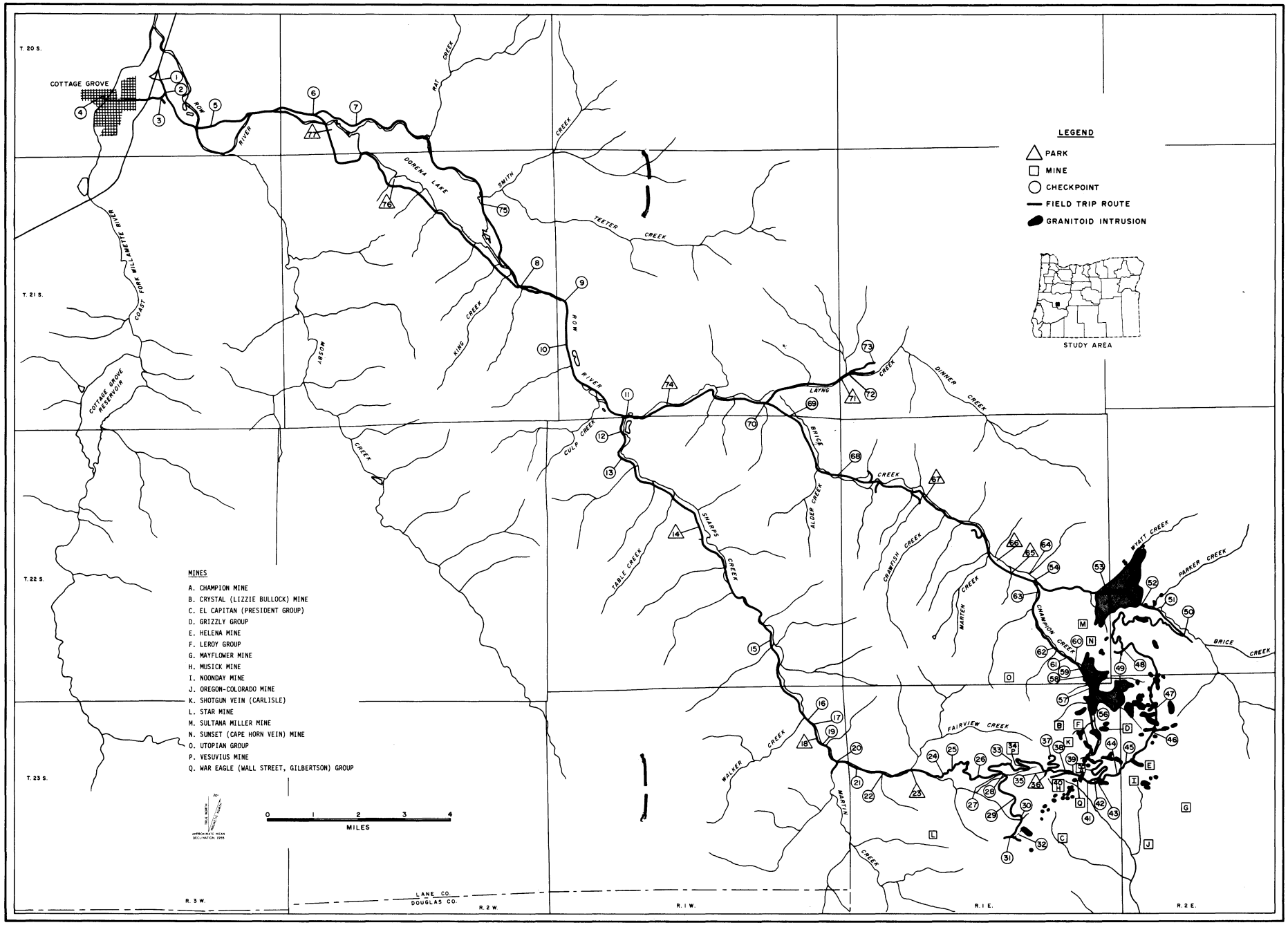


Figure 6. Photomicrograph of stibnite ore found at checkpoint 32. Clear material is quartz; metallic black is stibnite; straw-shaped crystals are stibiconite. (X10) (Photo courtesy Larry Brown)

Figure 7. Quartz crystals like these are found filling veins, lining vugs, and surrounding breccia fragments in many locations in the Bohemia district.

Figure 8. Radiating masses of stibnite found in veins at checkpoint 32.



MAP OF THE BOHEMIA MINING DISTRICT

Cartography by Kath Eisele

Numbers on this map refer to field trip guide that will be printed in next month's Ore Bin

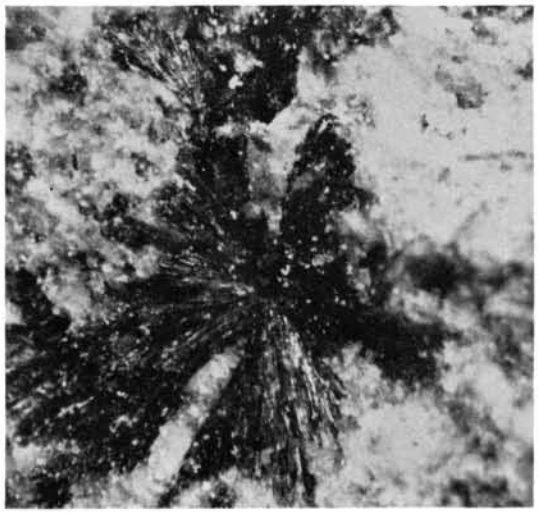


Figure 9. Photomicrograph of tourmaline (var. schorlite), which can be found at checkpoints 38, 40, and 58. (X10) (Photo courtesy Larry Brown)

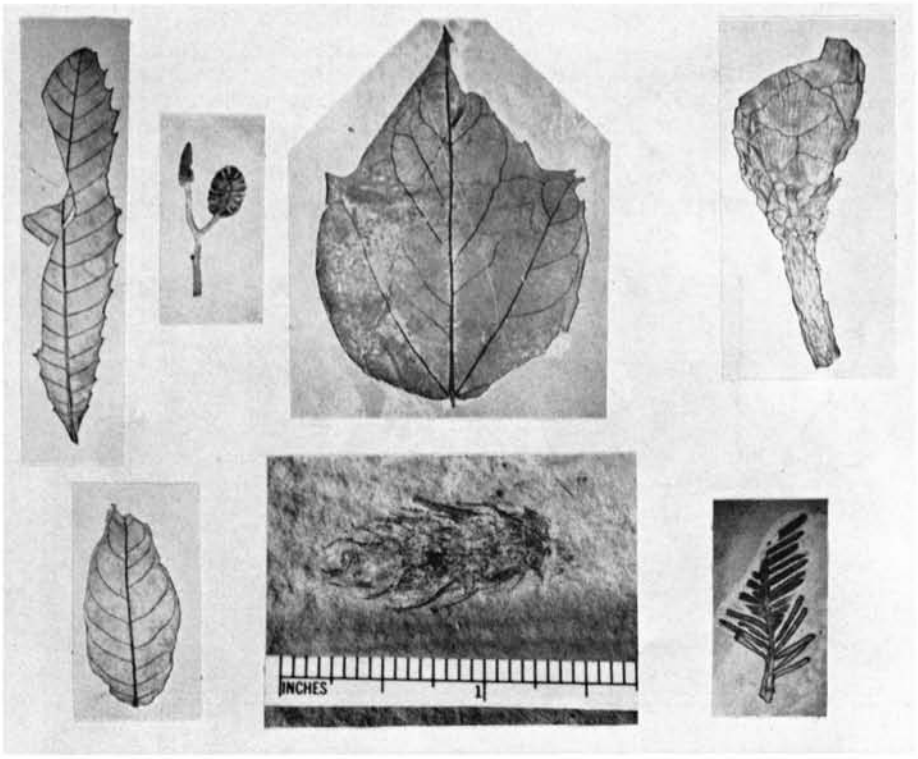


Figure 10. Rujada fossils from checkpoint 73. All but bottom center fossil are from Lakhanpal (1958).

hemia. In 1870 (?), the Knott trail (between checkpoints 35 and 37 and at checkpoint 41) was built by hand labor to the Knott claim, now part of the Champion group (checkpoint 55). In 1872 (?), the district's first stamp mill, powered by a steam engine and boiler, was installed on the Knott claim, where it ran for about 2 years. Recoveries were poor, however, and because the mill was located near the summit, water was scarce. Eventually the mill was closed because of litigation.

The Musick vein, the first really important discovery, was located in 1891, and a stamp mill was brought to the property by way of the Noonday trail (checkpoints 46, 49, and 63). Figure 11 shows the Ridge Hotel, at checkpoint 49, on the Noonday trail.

The Noonday mine was opened in 1892. A 10-stamp mill was installed at the Champion mine in 1895 and a 20-stamp mill at the Noonday in 1896. By 1902, not less than 2,000 claims (some undoubtedly duplicate recordings) had been filed in the district. Between 1902 and 1912, West Coast Mines Company consolidated the Champion, Helena, and Musick mines and erected a 30-stamp mill at the Champion. The Noonday was a producer between 1896 and 1908. The Vesuvius and Evening Star mines produced during the 1900's.

Between 1932 and 1938, Mahala Mines, Bartels Mining, and Minerals Exploration Companies produced ore with a total value of more than $400,000 at the old gold price of $33/oz. Between 1939 and 1942, Higgins and Hinsdale (H. and H. Mines, Inc.) completed some development work and erected a flotation mill and power plant at the Champion mine (Figure 12, checkpoint 55). In 1942, before major production was attained, the mill and plant were closed; however, considerable development ore had been milled. In 1944, F.J. Bartels acquired the mill and property from H. and H. Mines. Between 1945 and 1949, Bartels produced a small amount of gold from the Champion and Evening Star mines and milled ore from the Helena mine, operated by K.O. Watkins. In 1950, Watkins obtained the Champion lease and operated the Champion mill, producing about $35,000 at 1950 metal prices.

Figure 11. Ridge Hotel on the Noonday trail. (Photo courtesy Ray Nelson)

Figure 12. Champion flotation mill (checkpoint 55) as it appeared in the early 1960's. (Photo courtesy Fred Miller) Insert: Mill as it appears today.

In 1961 and 1962, the Office of Minerals Exploration contracted to help finance a long drift to expose the Musick vein 335 ft below the old No. 6 level. The Emerald Empire Mining Company did the work. In 1964, a diamond-drilling program to explore the Champion, Evening Star, Musick, and other nearby properties was announced by Federal Resources Corporation of Salt Lake City. The program was modified to include drilling on extensions of the Helena vein and a production drift known as the 1,000 level (Figure 13) on the California-Defiance veins of the Musick. Work was completed at 1,196 ft in May 1965.

The history of Bohemia is being kept alive by four community groups: the Cottage Grove Historical Museum (checkpoint 3); the Cottage Grove Prospectors; the Bohemia Mine Owners Association; and the Bohemia Mining Days, sponsored by the Cottage Grove Chamber of Commerce. The museum contains displays of mining tools from Bohemia, a working model of a stamp mill, and a full-scale 5-stamp mill. The Cottage Grove Prospectors are restoring the buildings at Bohemia City (Figure 14, checkpoint 40). The Bohemia Mine Owners Association has worked to keep surface resources of the mines open for public use. The Cottage Grove Bohemia Mining Days, scheduled annually on the third weekend in July, features a parade, art show, stage show, beer garden, and tour through the Bohemia district.

Ray Nelson, Cottage Grove, has been instrumental in keeping Bohemia history alive. Several photographs used in this series are from his collection. His book, "Facts and Yarns of the Bohemia, Oregon, Gold Mines,"

Figure 13. Three-car, compressed-air driven tram that ran from 1,000 level of Musick mine during diamond-drilling exploration program that included the Champion, Evening Star, Musick, and other mines in the Bohemia district.

Figure 14. Lundberg Stage House, one of buildings reconstructed at Bohemia City (checkpoint 40) by Cottage Grove Prospectors.

which can be purchased at the Cottage Grove Historical Museum, was the source of much of the history in this article.

Production

At today's prices, about $4.2 million in metallic minerals have been produced from the district (see Table 1, December 1977 Ore Bin). This is a little less than one-half of the total production from the north-central Western Cascades. Of the total Western Cascades' mineral output, the Bohemia district has produced: lead, 75 percent; gold, 63 percent; silver, 31 percent; copper, 26 percent; zinc, 5 percent; mercury, 0 percent. Hal Barton (oral communication, 1977) estimates that two-thirds of all production was obtained without modern equipment. Most mining, instead, was done with hand steel.

Present Status and Future Outlook

Currently, no mines in the Western Cascades are producing; but this condition will change if the economic and technological climates become more favorable for mining. The outlook depends largely on better definition of orebodies.

In Bohemia, assessment work is being done to keep unpatented mining claims current. Several patented mines have changed hands. Almost all old miners' cabins, mine buildings, and mill buildings have been destroyed. However, a large national mining firm is currently gaining a land base in the district.

Mining was started in the district with hand steel and the free milling gold found in the oxidized zones of veins. After the oxide zones bottomed out, sulfides of lead, zinc, and copper were found. A bulk concentrate of all of these sulfides can be produced very easily, but it cannot be sold. A copper smelter charges a penalty for lead and zinc, a lead smelter for copper and zinc, and a zinc smelter for lead and copper. The three sulfides, therefore, must be separated before being sold. The separating can be done with a flotation mill. The district had one flotation mill, at the Champion mine (checkpoint 55), but operation was suspended before major production was attained. One or two of the mines alone could not support a modern-day mill, but all of the mines together in the district could. Unfortunately, because the mines are all owned by different people, capital for a mill will be hard to find.

Two factors may change the outlook for mining in this and other districts. The U.S. Bureau of Mines has been studying the processing of bulk concentrates by electric smelting and electrowinning. If one of these processes were to be successful, a small gravity mill could be built at each mine. Another factor that could improve the mining situation would be an economic discovery by one of several national mining firms currently conducting exploration for copper-molybdenum porphyries. If one of the firms succeeds in this search, mining in the district will be conducted on a different scale than in the past. Bulk mining, through open pit, underground, or solution mining could be considered. Capital in the millions of dollars would be needed, and the district would have to be worked as a unit. Conceivably, one day's production could be greater than all of the district's past production.

Next month: A field trip guide to the Bohemia mining district.

References

Callaghan, E., and Buddington, A.F., 1938, Metalliferous mineral deposits of the Cascade Range in Oregon: U.S. Geol. Survey Bull. 893, 141 p.

Lakhanpal, R.N., 1958, The Rujada flora of west central Oregon: Berkeley and Los Angeles, Calif., Univ. California Publications in Geological Sciences, v. 35, no. 1, 66 p.

Lutton, R.J., 1962, Geology of the Bohemia mining district, Lane County, Oregon: Arizona Univ. doctoral dissert., 172 p.

Mason, R.S., Gray, J.J., and Vogt, B.F., 1977, Mineralization in the north-central Western Cascades: Ore Bin, v. 39, no. 12, p. 185-205.

Nelson, R., 1969, Facts and yarns of the Bohemia, Oregon, gold mines: Cottage Grove, Oreg., Sentinal Print Shop, 31 p.

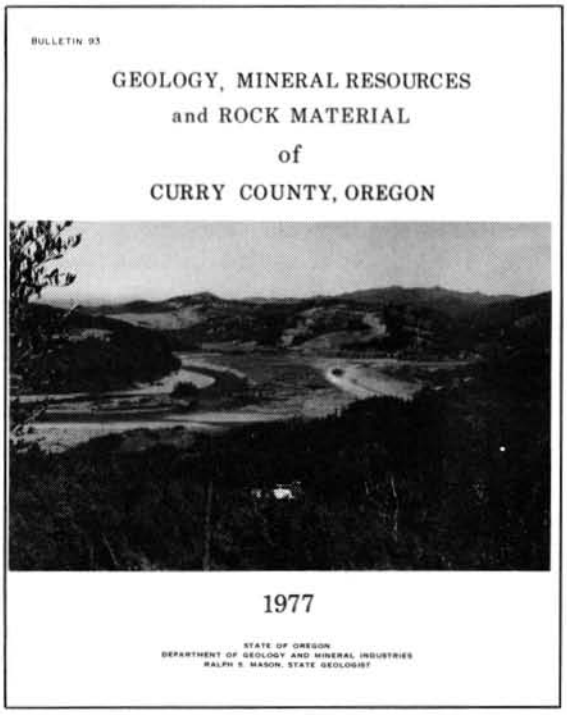
* * * * *

DEPARTMENT ISSUES THREE NEW BULLETINS

All of the bulletins described below were published by the Department and are on sale at the Department's Portland, Grants Pass, and Baker offices (see inside front cover for various addresses).

CURRY COUNTY STUDY RELEASED

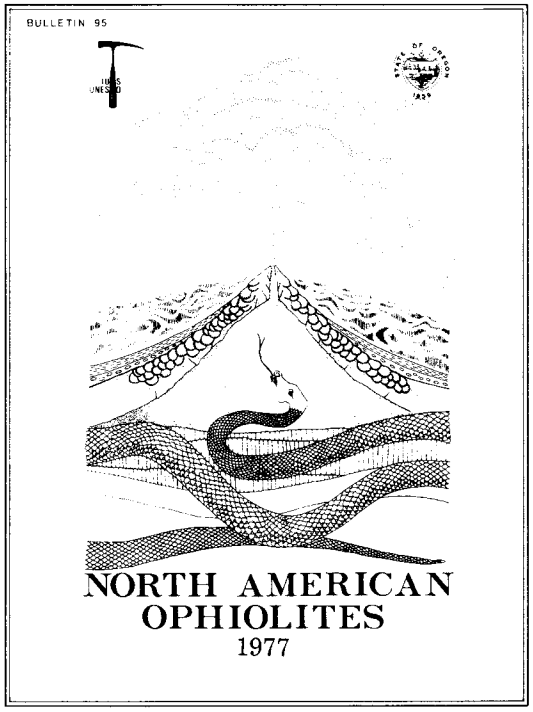
First of the publications recently completed by the Department is Bulletin 93, "Geology, Mineral Resources, and Rock Material of Curry County, Oregon," by Len Ramp, Herbert G. Schlicker, and Jerry J. Gray, all of the Department staff. The 79-page bulletin is intended to be a companion report to "Land Use Geology of Western Curry County, Oregon," by John Beaulieu and Paul Hughes, which was released as Bulletin 90 in 1976.



The new bulletin is a study embracing geography, geology, rock-material resources, metallic-mineral resources, nonmetallic-mineral resources, mineral fuels, and reclamation. Twelve figures, nine tables, and three maps accompany the text. The several appendices include a mined land reclamation application form, a reclamation plan guideline, and a glossary.

The authors wrote the bulletin to provide Curry County with mineral-resource information for use in planning and to add to the Department's data base.

The price is $7.00.



NORTH AMERICAN OPHIOLITES ATTRACT WORLDWIDE INTEREST

Participants from around the world attended the 1977 field excursions and seminars conducted by the International Geological Correlation Program to study ophiolites.

The North American excursions began in Newfoundland and ended in the Klamath Mountains province.

R.G. Coleman and W.P. Irwin, USGS, edited 13 papers from the conference, now on sale as Bulletin 95, "North American Ophiolites." The 183-page book contains many photographs and drawings, an index map of North America showing areas of ophiolites described, and five geologic maps in a pocket.

Bulletin 95 sells for $7.00.

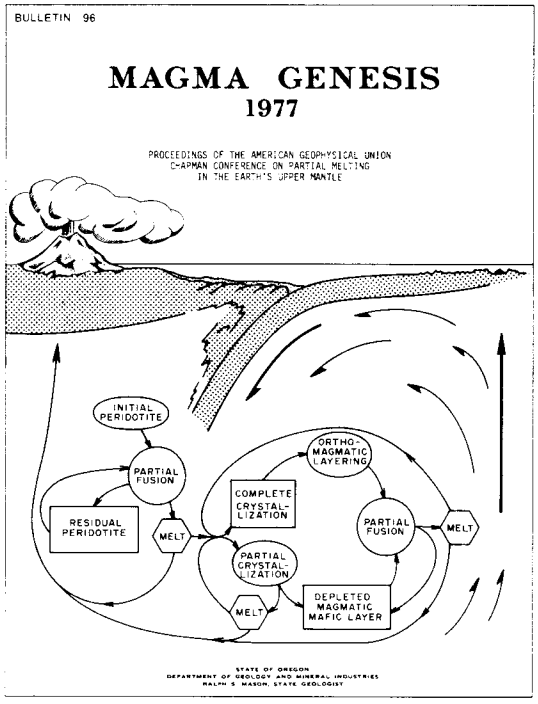
ORIGIN OF MAGMA IS STUDIED

"Magma Genesis" is the title of the Department's new Bulletin 96, a compilation of 19 papers from the Proceedings of the American Geophysical Union Chapman Conference on Partial Melting of the Earth's Upper Mantle.

Concepts of magma genesis developed in the text will be an aid to geologic mapping and to assessment of mineral wealth in magmatic terrain. Several of the articles deal directly with rock in Oregon.

Henry B. Dick, Woods Hole Oceanographic Institution, edited this comprehensive document, which includes numerous illustrations.

The 311-page book costs $12.50.



AVAILABLE PUBLICATIONS

(Please include remittance with order; postage free. All sales are final - no returns.
A complete list of Department publications, including out-of-print, mailed on request.)

BULLETINS	Price
26. Soil: Its origin, destruction, and preservation, 1944: Twenhofel	$ .45
33. Bibliography (1st suppl.) geology and mineral resources of Oregon, 1947: Allen	1.00
36. Papers on Tertiary foraminifera: Cushman, Stewart and Stewart, 1949: v.2	1.25
39. Geol. and mineralization of Morning mine region, 1948: Allen and Thayer	1.00
44. Bibliog. (2nd suppl.) geology and mineral resources of Oregon, 1953: Steere	2.00
46. Ferruginous bauxite deposits, Salem Hills, 1956: Corcoran and Libbey	1.25
49. Lode mines, Granite mining district, Grant County, Oregon, 1959: Koch	1.00
53. Bibliog. (3rd suppl.)geology and mineral sources of Oregon, 1962: Steere, Owen	3.00
57. Lunar Geological Field Conf. guidebook, 1965: Peterson and Groh, editors	3.50
61. Gold and silver in Oregon, 1968: Brooks and Ramp	8.00
62. Andesite Conference guidebook, 1968: Dole	3.50
63. Sixteenth biennial report of the Department, 1966-1968	1.00
64. Mineral and water resources of Oregon, 1969: USGS with Department	3.00
65. Proceedings of Andesite Conference, 1969: [copies]	10.00
67. Bibliog. (4th suppl.) geology and mineral resources of Oregon, 1970: Roberts	3.00
68. Seventeenth biennial report of the Department, 1968-1970	1.00
71. Geology of selected lava tubes in Bend area, Oregon, 1971: Greeley	2.50
72. Geology of Mitchell quadrangle, Wheeler County, 1971: Oles and Enlows	3.00
76. Eighteenth biennial report of the Department, 1970-1972	1.00
77. Geologic field trips in northern Oregon and southern Washington, 1973	5.00
78. Bibliog. (5th suppl.) geology and mineral resources of Oregon, 1973: Roberts	3.00
79. Environmental geology inland Tillamook and Clatsop Counties, 1973: Beaulieu	7.00
80. Geology and mineral resources of Coos County, 1973: Baldwin and others	6.00
81. Environmental geology of Lincoln County, 1973: Schlicker and others	9.00
82. Geol. hazards of Bull Run Watershed, Mult., Clackamas Counties, 1974: Beaulieu	6.50
83. Eocene stratigraphy of southwestern Oregon, 1974: Baldwin	4.00
84. Environmental geology of western Linn County, 1974: Beaulieu and others	9.00
85. Environmental geology of coastal Lane County, 1974: Schlicker and others	9.00
86. Nineteenth biennial report of the Department, 1972-1974	1.00
87. Environmental geology of western Coos and Douglas Counties, 1975	9.00
88. Geology and mineral resources of upper Chetco River drainage, 1975: Ramp	4.00
89. Geology and mineral resources of Deschutes County, 1976	6.50
90. Land use geology of western Curry County, 1976: Beaulieu	9.00
91. Geologic hazards of parts of northern Hood River, Wasco, and Sherman Counties, Oregon, 1977: Beaulieu	8.00
92. Fossils in Oregon (reprinted from the ORE BIN), 1977	4.00
93. Geology, mineral resources, and rock material of Curry County, Oregon	in press
94. Land use geology of central Jackson County, Oregon, 1977	9.00

GEOLOGIC MAPS	
Geologic map of Galice quadrangle, Oregon, 1953	1.50
Geologic map of Albany quadrangle, Oregon, 1953	1.00
Reconnaissance geologic map of Lebanon quadrangle, 1956	1.50
Geologic map of Bend quadrangle and portion of High Cascade Mtns., 1957	1.50
Geologic map of Oregon west of 121st meridian, 1961	2.25
Geologic map of Oregon east of 121st meridian, 1977	3.75
Geologic map of Oregon (9 x 12 inches), 1969	.25
GMS-3: Preliminary geologic map of Durkee quadrangle, Oregon, 1967	2.00
GMS-4: Oregon gravity maps, onshore and offshore, 1967 [folded]	3.00
GMS-5: Geologic map of Powers quadrangle, Oregon, 1971	2.00
GMS-6: Prelim. report on geology of part of Snake River Canyon, 1974	6.50
GMS-7: Geology of the Oregon part of the Baker quadrangle, Oregon, 1976	3.00

The ORE BIN
1069 State Office Bldg., Portland, Oregon 97201

Second Class Matter
POSTMASTER: Form 3579 requested

The Ore Bin

Available Publications (continued)

		Price
THE ORE BIN		
Issued monthly - Subscription	[Annual]	$ 3.00
	[3-year]	8.00
Single copies of current or back issues	[Over the counter]	.25
	[Mailed]	.35

OIL AND GAS INVESTIGATIONS

2.	Subsurface geology, lower Columbia and Willamette basins, 1969: Newton	3.50
3.	Prelim. identifications of foraminifera, General Petroleum Long Bell #1 well	2.00
4.	Prelim. identifications of foraminifera, E.M. Warren Coos Co. 1-7 well, 1973	2.00
5.	Prospects for natural gas prod. or underground storage of pipeline gas	5.00

SHORT PAPERS

18.	Radioactive minerals prospectors should know, 1976: White, Schafer, Peterson	.75
19.	Brick and tile industry in Oregon, 1949: Allen and Mason	.20
21.	Lightweight aggregate industry in Oregon, 1951: Mason	.25
24.	The Almeda mine, Josephine County, Oregon, 1967: Libbey	3.00
25.	Petrography, type Rattlesnake Fm., central Oregon, 1976: Enlows	2.00

MISCELLANEOUS PAPERS

1.	A description of some Oregon rocks and minerals, 1950: Dole	1.00
2.	Oregon mineral deposits map (22 x 34 inches) and key (reprinted 1973):	1.00
4.	Laws relating to oil, gas, & geothermal exploration & development in Oregon	
	Part 1. Oil and natural gas rules and regulations, 1977	1.00
	Part 2. Geothermal resources rules and regulations, 1977	1.00
5.	Oregon's gold placers (reprints), 1954	.50
6.	Oil and gas exploration in Oregon, rev. 1965: Stewart and Newton	3.00
7.	Bibliography of theses on Oregon geology, 1959: Schlicker	.50
	Supplement, 1959-1965: Roberts	.50
8.	Available well records of oil and gas exploration in Oregon, rev. 1973: Newton	1.00
11.	Collection of articles on meteorites, 1968 (reprints from The ORE BIN)	1.50
12.	Index to published geologic mapping in Oregon, 1968: Corcoran	.50
13.	Index to The ORE BIN, 1950-1974	1.50
14.	Thermal springs and wells, 1970: Bowen and Peterson (with 1975 suppl.)	1.50
15.	Quicksilver deposits in Oregon, 1971: Brooks	1.50
16.	Mosaic of Oregon from ERTS-1 imagery, 1973	2.50
18.	Proceedings of Citizens' Forum on potential future sources of energy, 1975	2.00
19.	Geothermal exploration studies in Oregon - 1976, 1977	3.00

MISCELLANEOUS PUBLICATIONS

Oregon base map (22 x 30 inches)	.50
Landforms of Oregon (17 x 12 inches)	.25
Mining claims (State laws governing quartz and placer claims)	.50
Geological highway map, Pacific NW region, Oregon-Washington (pub. by AAPG)	3.00
Fifth Gold and Money Session and Gold Technical Session Proceedings, 1975 (including papers on gold deposits, exploration, history, and production)	5.00

Colored postcard, GEOLOGY OF OREGON . . . 10¢ each; 3 for 25¢; 7 for 50¢; 15 for 1.00