STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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REPORT OF RECONNAISSANCE OF THE AREA FROM PANTHER BUTTE TO TELLURIUM PEAK, DOUGLAS COUNTY, OREGON

By
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Introduction and abstract

During September 1950 twelve days were spent by the authors in a reconnaissance of the area from Panther Butte to the Silver Peak mine on Silver Butte, from the Silver Peak mine northeastward to the Gold Bluff mine on the north side of Tellurium Peak, and along the West Fork of Canyon Creek, southwestern Douglas County, Oregon. The area is roughly five miles wide and fourteen miles in length and consists of a greenstone belt bordered on the west by the Dothan sediments and on the east outside of the immediate area by the Galice formation. The greenstones contain numerous serpentine and rhyolite masses (see accompanying map).

Dole and Baldwin (1947:99) recommended a study of this area as a result of their reconnaissance of a larger area extending from the Almeda to the Silver Peak mines. This memorandum report is written as a supplement to their report, which should be consulted for background and bibliography of the geology of the region.

The purpose of this reconnaissance was to attempt to trace the mineralized zone of the Silver Peak mine southwestward to Panther Butte and northeastward beyond Silver Butte. Also, the search was continued for barite as diagnostic of mineralization since barite is one of the principal gangue minerals in the Silver Peak mine as well as at the Almeda mine. However, no additional occurrences of barite were found during this reconnaissance.

According to Shenon (1933) the contact between the Dothan formation and the greenstones in general strikes to the northeast, and in the vicinity of Silver Peak, dips steeply to the southeast. The schistosity and the zones of mineralization in this area conform with this trend. The ore bodies of the Silver Peak mine occur in a mineralized zone in schists, which Shenon considered as part of the Dothan formation. During this reconnaissance, mineralized zones in greenstone were observed on Canyon Creek to the east of the Silver Peak zone.

Northeast of the Silver Peak mine, mineralized shear zones in leached, silicified schists were noted in the workings of the following mines and prospects: the Golden Gate mine (east workings), about half a mile north of the Silver Peak mine, in sec. 23, T. 31 S., R. 6 W.; the Huckleberry mine in SE$\frac{1}{4}$ sec. 7, T. 31 S., R. 5 W.; the Sweetbrier mine in SW$\frac{1}{4}$ sec. 5, T. 31 S., R. 5 W.; and at an outcrop below the lower mine workings of the Gold Bluff mine.

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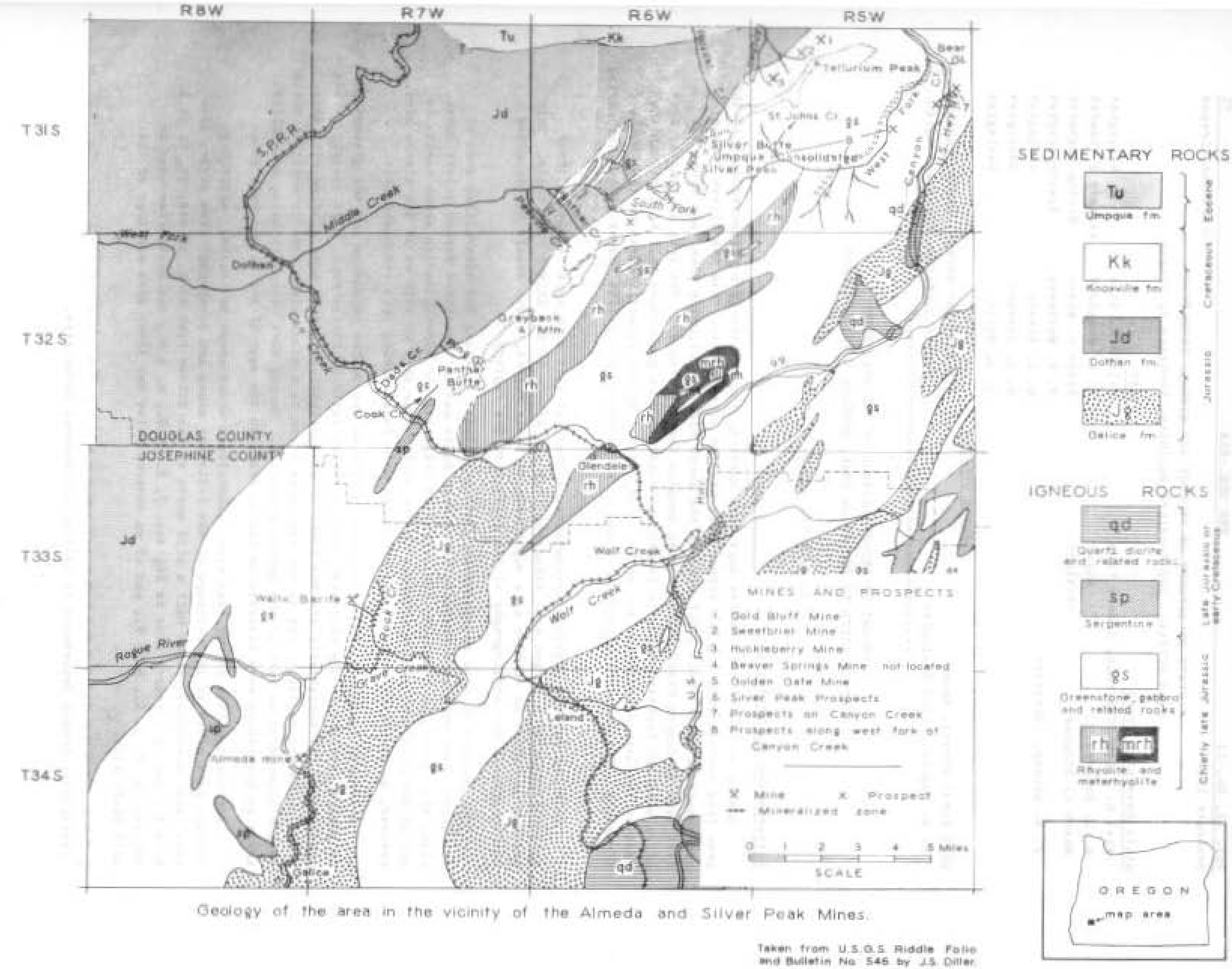

Geology of the area in the vicinity of the Almeda and Silver Peak Mines.

Taken from U.S.G.S. Riddle Folio and Bulletin No. 546 by J.S. Diller.

In general the sulphide minerals are rather sparsely distributed in the leached schists of the above mines, and massive sulphides were not observed in any of them. Southwest of the Silver Peak mine mineralized zones were observed in workings of the Silver Peak prospects located in sec. 27, T. 31 S., R. 6 W. It is doubtful that the mineralized zones of the Silver Peak prospects represent an actual continuation of the ore zones of the Silver Peak mine, but probably they are either individual zones along the same general trend or faulted parts of the Silver Peak zone.

Dole and Baldwin (1947:98) mention a prospect tunnel which was driven along a quartz stringer in greenstone on the south side of the South Fork of Middle Creek. This quartz stringer does not follow the trend of the shear zones, but apparently was formed in a cross fracture in the greenstone. Southwestward beyond this point along the west slope of Grayback Mountain and Panther Butte no mineralized zones were found other than along quartz stringers in serpentine masses.

A siliceous mineralized zone occurs along the West Fork of Canyon Creek and is exposed on the east bank of Canyon Creek along U.S. Highway 99 approximately 0.8 of a mile south of Bear Gulch. This zone of mineralization occurs in greenstone and trends northeastward paralleling the shear zone of the Silver Peak area.

Some mines and prospects in the area other than the Silver Peak and Umpqua Consolidated mines

Because Shenon (1933) discusses the Silver Peak and Umpqua Consolidated mines, a detailed review of ore deposits and developments at these mines is not included in this report. The mines and prospects visited during this reconnaissance are listed below. All elevations mentioned were determined with an altimeter and only a minor amount of control was available for checking and adjusting the readings of the instrument.

Gold Bluff mine (1)*

The Gold Bluff mine is located in the NE$\frac{1}{4}$ sec. 5, T. 31 S., R. 5 W., in what appears to be foliated greenstone close to a small serpentine mass. Several tunnels have been driven in the serpentine in this general area. On a logging road at an altitude of 1,600 feet about 200 feet below what is believed to be the lower workings of the Gold Bluff mine is a 15-foot-wide iron-stained leached zone containing disseminated sulphides. This zone strikes N. 45° E. and dips steeply to the southeast. A grab sample (P-10389) from this zone assayed in the Department's laboratory contained no gold or silver.

Sweetbrier mine (2)

The Sweetbrier mine is located in SW$\frac{1}{4}$ sec. 5, T. 31 S., R. 5 W., on the East Fork of Mitchell Creek. Buildings on the property are located at an altitude of 1,710 feet. Southeast of the buildings at an elevation of 1,820 feet are an open cut and a 35-foot drift on a northeastward-striking pale green to white schist with disseminated sulphides. Pyrite, some chalcopyrite, and a small amount of malachite were observed in one specimen obtained.

It is likely that this mine is the same as the Gold Ridge claim.**

Huckleberry mine (3)

The Huckleberry mine is located in the SE$\frac{1}{4}$ sec. 7, T. 31 S., R. 5 W., on the north side of a southeast fork of Mitchell Creek. It is owned by E. B. Hart and F. J. Fahy. Equipment at the mine consists of a mill building with a small two-stamp mill and a concentrating table.

There are two tunnels on the property, a short lower tunnel at 1,800 feet in elevation and a larger upper tunnel at an altitude of 1,950 feet. An old tram 200 to 300 feet in

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*Numbers after mine names are the same as key numbers on accompanying map.

**Oregon Dept. Geology and Mineral Industries Bull. 14-C, vol. 1, p. 102, 1940.

length extends from the mill building to the upper workings. The portal of the upper tunnel is caved, but it appears to trend N. 50° E. The size of the dump indicates several hundred feet of workings. The material on the dump consists mainly of a light-green to gray schist with disseminated sulphides. The lower workings are in greenstone and chloritic schist. This tunnel extends N. 80° E. for 80 feet and then forks, one branch of which extends a short distance N. 25° E. and the other S. 60° E. About 2 feet of sheared material with a minor amount of pyrite is exposed a few feet from the face of the southeastward-trending branch. This zone strikes N. 40° E. and dips SE 75°.

Production and history of this mine is recorded* as follows:

> "Mineral was reportedly discovered in 1912 . . . and work has been carried on sporadically since that time. The record of production is as follows: 1912-1915, $2000; 1931, $400; 1932-1936, $4000 per year."

Beaver Springs mine (4)

This mine was not found but is reported** to be located in secs. 7 and 18, T. 31 S., R. 5 W. H. L. Shawver, now deceased, is said to have traced the Silver Peak mineralized zone in a northeasterly direction toward the Beaver Springs mine. From 1923 to 1928 a tunnel trending S. 35° E. was driven for over 1,000 feet. Its portal is now caved. Ore is reported to have shown pyrite, chalcopyrite, bornite, and sphalerite, and a sample of the ore is said to have assayed 12 percent copper, 1 ounce of gold, and 12 ounces of silver to the ton.

Golden Gate mine (5)

The main workings of the Golden Gate mine are located east of the Silver Butte road at an elevation of about 3,000 feet and consist of a shaft, an open cut, and several short tunnels. According to Shenon (1933:23-24):

> "Most of the mining on the north side of Silver Peak has been done by N. A. Bradfield on the Golden Gate property. He located seven claims in 1919, and although lessees have since worked the property, he still retains the ownership. According to Mr. Bradfield two cars of ore have been shipped. One car containing 36 tons gave gross smelter returns of $1,000, mostly in gold, and another car shipped by lessees is reported to have returned $1.76 a ton.
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> "In all, about 600 feet of underground development work has been done. Most of the work has been concentrated on the claims near the road in the vicinity of the Bradfield cabin; the remainder on claims about half a mile to the east.
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> "The production has come chiefly from an open cut and some shallow workings close to the Silver Butte road. The ore occurring here is a dark grayish-green chlorite schist striking N. 30° - 60° E. and dipping 50°-70° SE. A layer in the schist contains pyrite cubes and some stringers of chalcopyrite, and according to Mr. Bradfield free gold can be panned from some of the rock. The pyrite cubes range in size from those that are barely visible to some with faces over half an inch across. The cubes cut across the schistosity of the enclosing rock, thus indicating that they were formed later."

The mineralized zone in the chlorite schist at the main workings shows little similarity to that at the Silver Peak and Umpqua Consolidated mines.

Two tunnels several hundred feet east of these workings have been driven in gray to white, siliceous leached schist containing disseminated sulphides. The schist is similar

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*op. cit., page 105.

**op. cit., page 100.

to that at the Silver Peak and Umpqua Consolidated mines, but contains less quartz. A lower tunnel is at an altitude of about 2,925 feet and an upper tunnel is about 100 feet higher.

The upper tunnel consists of a crosscut tunnel running S. 50° E. for 65 feet. Thirty feet in from the portal, gray to white leached schist with disseminated sulphides is encountered and extends for about 20 feet. About 45 feet from the portal a drift turns S. 50° W. and follows the schist for 30 feet. The schist dips steeply to the SE. Greenstone is exposed at the face of the crosscut and faulting is indicated. A short distance east of the portal a prospect pit exposes the schist which appears to have been sheared off by faulting.

The lower crosscut is approximately 200 feet in length. A drift extending northeast and southwest from this crosscut exposes leached mineralized schist which has a maximum thickness of about 10 feet. The schist strikes N. 50° E. and dips 60° SE. and appears to pinch out at both ends of the drift.

Silver Peak prospects (6)

A short crosscut tunnel is located in sec. 27, T. 31 S., R. 6 W., on the east side of a new fire access road leading to the southwest from Silver Butte road at a point 0.4 mile from the saddle south of the Silver Peak mine. Elevation of the portal is 3,340 feet. The tunnel extends S. 45° E. into the hill approximately 80 feet. At 70 feet along the crosscut a drift extends approximately 50 feet S. 50° W. Fifteen feet from the beginning of the drift another crosscut runs S. 40° E. for 20 feet. About 15 feet of leached siliceous schistose material with disseminated sulphides is exposed in this crosscut. The mineralized zone strikes N. 45° E. and dips 57° SE. This zone is bounded on the northwest by a fine-grained white chert.

Dole and Baldwin (1947:99) mention a tunnel on the Silver Peak property, located at the head of a small tributary of the South Fork of Middle Creek. This tunnel at about 3,200 feet in elevation trends N. 40° E. and parallels the schistosity. It was flooded and could not be entered. The leached schistose zone appears to be bounded on the southeast by greenstone and on the northwest by a fine-grained gray to white chert (?).

One hundred fifty feet lower and a short distance south of the tunnel at 3,200 feet in elevation is a tunnel which drifts on a schistose leached zone extending N. 40° E. approximately 50 feet, then turns N. 70° E. for 50 feet and then N. 60° E. for 150 feet. This drift follows a sheared mineralized zone ranging from 3 to 10 feet wide. The last 150 feet has a well-defined hanging wall which strikes N. 60° E. and dips 65° SE.

Prospects on Canyon Creek (7)

A mineralized zone consisting of siliceous material with disseminated sulphides is exposed in new road cuts along U.S. Highway 99 and along Canyon Creek about 0.8 mile south of Bear Gulch. The zone appears to strike to the northeast. More than 600 feet of this zone is estimated to be exposed in the east bank of Canyon Creek which cuts diagonally across the strike of the mineralized zone. A chip sample was taken from 200 feet of this zone exposed along the creek. The sample (P-10387) showed a trace of gold and no silver or copper. A short tunnel on the north side of a small tributary to the west of Canyon Creek penetrated about 20 feet of the zone before greenstone was encountered. A dump on the east side of Canyon Creek several hundred feet north of the locality where sample P-10387 was obtained shows similar siliceous material containing sulphides. The adit here was filled with water and was not examined.

Prospects along the West Fork of Canyon Creek (8)

In the SE$\frac{1}{4}$ sec. 15, T. 31 S., R. 5 W., on the east side of the West Fork of Canyon Creek at an elevation of about 1,325 feet is an old prospect consisting of an open cut and an inclined shaft which explore a siliceous mineralized zone in greenstone. The prospect is 3.1 miles from U.S. Highway 99 via California-Oregon Power Company power line road that follows along the west side of the West Fork of Canyon Creek. A cabin is located on the east side of the road. The open cut trends N. 45° E. for about 40 feet along the strike of the mineralized zone which is 6 feet wide and contains disseminated sulphides, mainly pyrite and chalcopyrite. The zone as exposed in the inclined shaft, which is 20 feet deep, appears to contain more quartz than that part of it exposed in the cut and is heavier in sulphides which frequently are in massive bands. A grab sample (P-10386 B) from the dump at the shaft assayed as follows: a trace of gold, no silver, and 1.20 percent copper.

At a point 3.3 miles from U.S. Highway 99 along the power line road a 4-foot zone of leached, siliceous, iron-stained sericitic material crosses the road, and at 3.45 miles at an altitude of 1,340 feet leached, siliceous sericitic schist is exposed. Four miles along this road on the hillside to the west leached siliceous schist is exposed in a small cut. The schist as exposed in the cut strikes N. 40° E. and dips to the SE. and contains a minor amount of sulphides.

At a distance of 5.8 miles the power line road turns to the southwest following along a tributary of the West Fork of Canyon Creek. At 5.9 miles a prospect is located on the east side of this tributary. Development work consists of a crosscut and a shaft. Siliceous material containing abundant sulphides was found on the dump. Elevation of the crosscut is 1,625 feet and the shaft is at 1,700 feet. West of the main road along an access road to the power line, white schists are exposed.

An adit on the west side of St. Johns Creek in sec. 19, T. 31 S., R. 5 W., at an altitude of 1,800 feet exposes gray siliceous material with finely disseminated sulphides at its portal. No attitude could be determined.

Peavine-Panther creeks prospect (9)

At an approximate elevation of 3,000 feet on the ridge between Peavine Creek and Panther Creek several open pits and one tunnel running S. 55° W. are located in a small serpentine mass bounded by greenstone. No indication of a mineralized zone similar to that in the Silver Peak mine was found in this area.

Cook Creek-Ping Gulch prospects (10)

Several prospects were noted along Cook Creek northeastward to Ping Gulch on the west slope of Panther Butte. These prospects, both placer and lode, consist of workings in a serpentine mass along the western edge of the belt of greenstone. The serpentine contains numerous quartz stringers.

Bibliography

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ALUMINA PLANT "CONSIDERED"

It is known that Harvey Machine Co. of Torrance, California, has been considering the possibility of putting a plant for the production of alumina from imported bauxite in the Portland, Ore., area to supply its proposed aluminum reduction plant at Kalispell, Mont. The project is still in a nebulous and exploratory stage with inquiries having been made as to potential plant sites and ore unloading and handling facilities. In spite of the vast aluminum reduction plants operating in the Pacific Northwest no alumina plants exist there with all alumina being brought in from southeastern United States.

(From Iron Age, West Coast Edition, San Francisco, November 23, 1950)

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DEMAND FOR METALS

The following has been extracted from the Monthly Letter of the National City Bank of New York, December 1950, under the heading "Shortages and Stockpiling."

Before the Korean war, stockpile purchases of copper were absorbing 20,000 to 25,000 tons a month, and since Korea they have averaged around 15,000. Total holdings are estimated to be approaching 400,000 tons. With this diversion of supply, even before Korea, the high civilian consumption was being met only by drawing down producers' and fabricators' stocks, which are now reduced to minimum levels. The limitation order is designed to bring consumption (excluding armament use) down to around 100,000 tons monthly. The prospective supply, including net imports, may run around 140,000 tons a month. Since the increase in armament use for some time ahead is not expected to exceed 15,000 tons, it appears that continuation of stockpiling at the recent rate is intended, and that stockpiling is the basic reason for the limitation order. In conversion deals copper has commanded up to 40 cents a pound.

Zinc stockpiling has been taking some 12,000 tons a month during most of 1950 and producers' stocks have almost disappeared. The zinc stockpile is around 475,000 tons. One of the important uses for copper and zinc is in making brass for shell casings, which requires 70 percent copper and 30 percent zinc. Thus the zinc stockpile is greatly excessive in relation to copper stocks. Meanwhile steel companies are curtailing galvanizing operations for lack of zinc, and it is reported that as high as 50¢ is asked in the gray market for high-grade zinc used in die casting. Copper and zinc are only two examples of the part played by stockpile purchases in the developing scarcity of basic materials.

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VERNON SCHEID HEADS UP MACKAY SCHOOL OF MINES

Dr. Vernon E. Scheid, Professor of Geology and Chairman of the Department of Geology-Geography, University of Idaho, has accepted the position of dean of the Mackay School of Mines, University of Nevada. Dr. Scheid will move to Reno, Nevada, about February 1, 1951.

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DEPARTMENT PUBLICATION TO BE USED IN HEBREW UNIVERSITY

The Department has recently filled an order received from the Hebrew University, Jerusalem, Israel, for two volumes of the serial Bulletin No. 36. Two volumes of this bulletin have been issued in collaboration with the U.S. Geological Survey as part of the Department's program of setting up a stratigraphic section of the Tertiary of western Oregon, based mainly upon studies in micropaleontology. The third volume is in preparation.

Ten other foreign orders have come from universities and oil companies in Venezuela, Colombia, Peru, and Germany.

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OREGON SECTION A.I.M.E. ELECTS NEW OFFICERS

Mr. D. H. Beetem, Chief Metallurgist for the Aluminum Company of America's Vancouver reduction plant, was elected chairman for 1951 at the regular monthly meeting of the Oregon Section of the American Institute of Mining and Metallurgical Engineers held at the Mallory Hotel in Portland December 15. Mr. S. M. Shelton, Regional Director, Region II, U.S. Bureau of Mines, was elected vice-chairman and Mr. James Bell, Vice-President of the Portland Gas & Coke Company, was elected secretary-treasurer. Mr. A. O. Bartell, Managing Engineer of the Raw Materials Survey, Inc., the outgoing chairman, automatically becomes a member of the Executive Committee.

After the election of officers a few of the thirty consulting engineer members of the Oregon Section conducted a panel discussion entitled the "Who-Why-Where-When and What of the Consulting Mining Engineering Field." Mr. E. A. Messer, of Messer, Toy & Associates, was the toastmaster.

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CHEMICAL CONSTRUCTION FACILITIES

Sulfuric acid production is one of the barometers of business. Over 10,000,000 tons are produced each year in the United States; a significant figure regarding its importance. Also of importance to industrial development is the fact that it is produced at low cost and in good quality. These features are a tribute to the chemical engineers whose knowledge of construction materials and whose creative skill in design and instrumentation has raised chemical and mechanical efficiency to the maximum. It is of interest to note that this engineering skill is not a closely guarded secret. Hundreds of these highly efficient acid plants have been built throughout the world and they have contributed greatly to industrial development with its attendant benefits to human welfare.

Ammonia is another important chemical in large scale production. It is probably the most important of the nitrogen compounds not only for its direct use, but also for its basic value as a raw material for dyes, pharmaceuticals, plastics and a host of other things. Almost everyone knows the chemical formula for water, H_2O, signifying a combination of two atoms of hydrogen and one of oxygen. The formula for ammonia is just about as simple, NH_3; one atom of nitrogen combined with three atoms of hydrogen. Nature supplied us with plenty of water but we must make most of the ammonia we use. It would seem simple to put the two gases together in the ratio of one to three and so produce NH_3. But, when this is done, each gas ignores the other completely and nothing happens. However, apply considerable pressure, 5,000 pounds per square inch, and provide the proper catalyst, and the reaction goes smoothly producing a good yield of NH_3. Here again commercial success depends on skillful chemical engineering and low cost raw materials.

Ammonia is used in a variety of nitrogenous fertilizers. It may be reacted with sulfuric acid to produce ammonium sulfate, or with phosphoric acid for ammonium phosphate, both of which are widely used fertilizers. Ammonia may also be converted into nitric acid which may then be reacted with more ammonia to give ammonium nitrate, a fertilizer with high nitrogen content. If limestone is readily available it may be reacted with nitric acid to produce calcium nitrate fertilizer.

A huge plant designed to produce ammonium sulfate is nearing completion at Sindri, India, and another designed to produce 200,000 tons of calcium nitrate per year is underway at Suez, Egypt. Here a good supply of limestone is available and this fertilizer is well suited to the requirements of Egyptian agriculture. The plant is of most modern design. Every important detail was calculated precisely before a foot of earth was turned on the 1,350 acres which this project covers. A similar project, nearly completed, will produce 75,000 tons of ammonium sulfate for fertilizer in Mexico, and others of equal importance are projected in countries where soil depletion is reducing crops.

These chemical plants will contribute greatly to alleviate the food shortage which exists in many parts of the world. Therefore it seems certain that at least one of the Four Horsemen of the Apocalypse soon shall ride the earth no more; the specter of famine need no longer haunt mankind. Then too, the dread Horseman of disease and pestilence is yielding fast; and perhaps, he who rides the blood red horse shall also fall. And even the haggard rider on the pale horse has been forced to assign more years to man, thanks to science and engineering.

(From For Instance, published by American Cyanamid Company, New York.)

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NEW LIMONITE PLANT

Mr. James Orr is operating a pilot plant at Scappoose, Oregon, designed to activate limonite used in desulphurizing manufactured gas. Limonite mined from a deposit located about 2 miles west of Scappoose is being used. A considerably larger plant is now being built by Mr. Orr at the Scappoose location to replace the pilot plant. Grinding equipment and air separators are already in place. When completed the plant will have excess grinding capacity for work other than limonite activation.

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