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SUMMARY OF WALLOWA MOUNTAINS GEOLOGY

By
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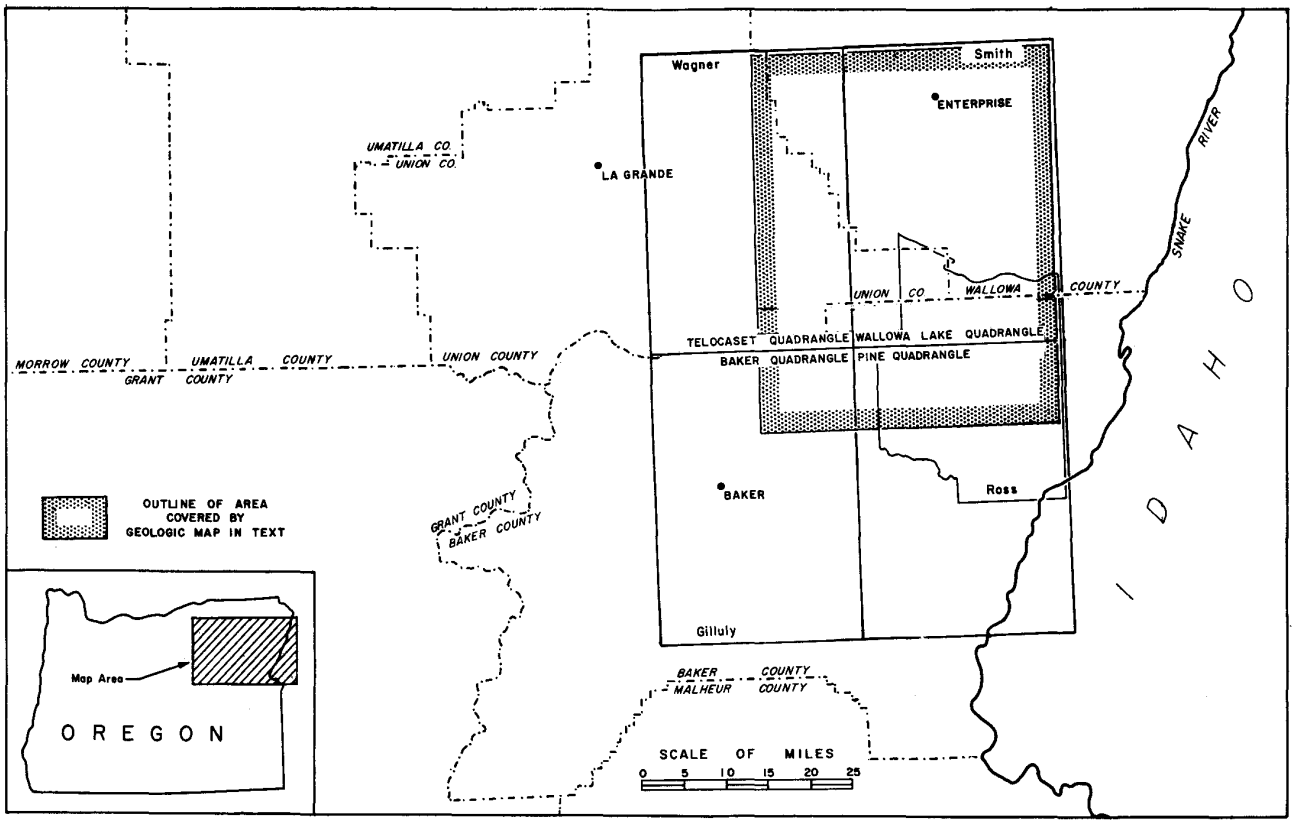
Introduction

The Wallowa Mountains in northeastern Oregon represent an area in which important geologic mapping has been done but for which only an incomplete map coverage is now available. This report and accompanying geologic map (p. 32) were prepared in order to make information on the geology of the Wallowas available to the public at a time when this information may be of assistance to uranium prospectors during this and succeeding field seasons.

Four separate maps were used in compiling the one reproduced herewith. The area covered by these maps is shown on the index map below along with the identity of the authors. Since the original maps are each quite large, reduction to the present scale could not be made without some loss of detail. However, the reduction has not resulted in loss of important detail that would change the basic geology as shown on the original maps.



Index Map

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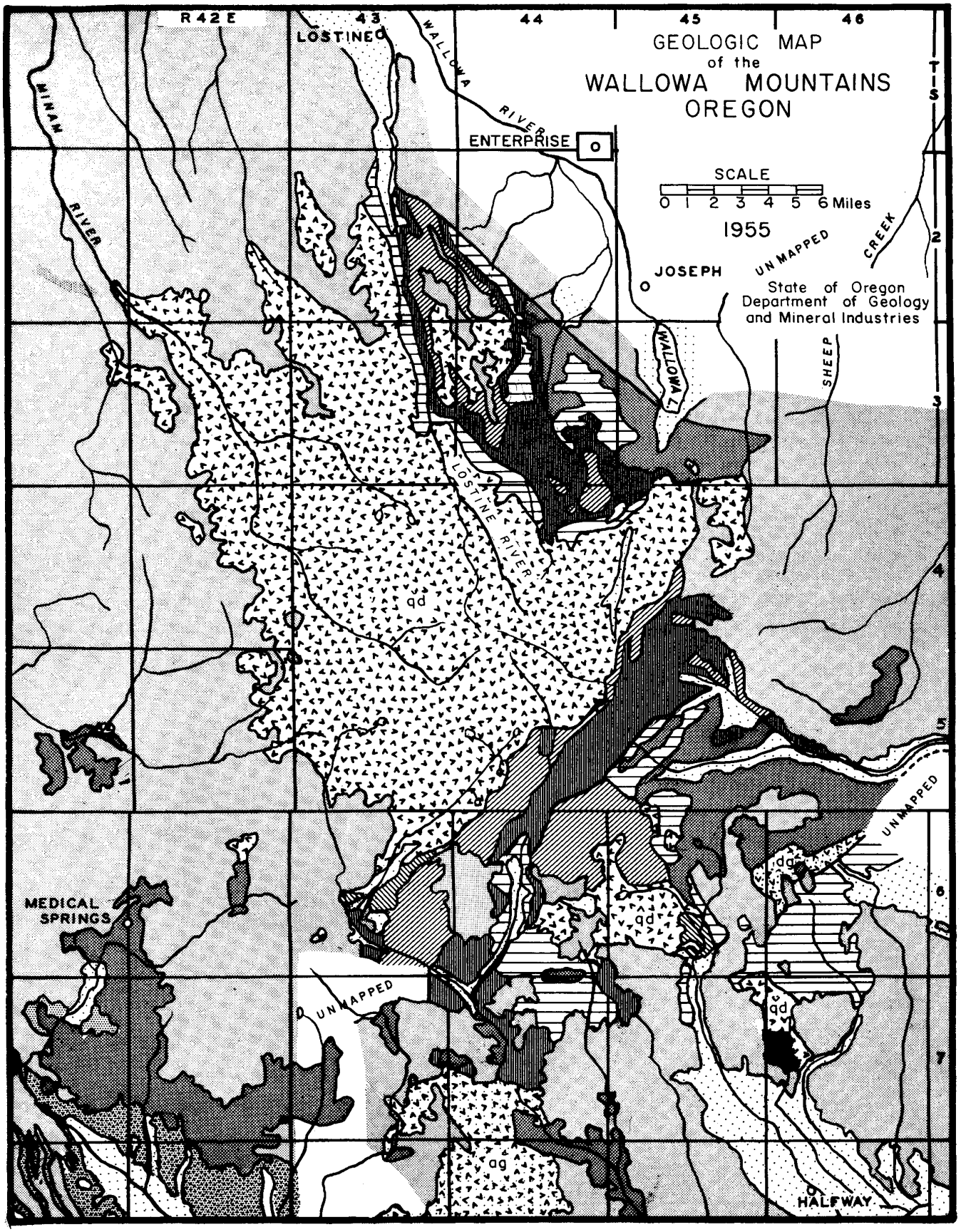

GEOLOGIC MAP
of the
WALLOWA MOUNTAINS
OREGON
1955
SCALE
0 1 2 3 4 5 6 Miles
State of Oregon
Department of Geology
and Mineral Industries
R42E
43
44
45
46
T1S
2
3
4
5
6
7
LOSTINE
WALLOWA RIVER
ENTERPRISE
MINAM RIVER
JOSEPH
UNMAPPED
WALLOWA L.
SHEEP CREEK
LOSTINE RIVER
qd
dg
ag
MEDICAL SPRINGS
HALFWAY

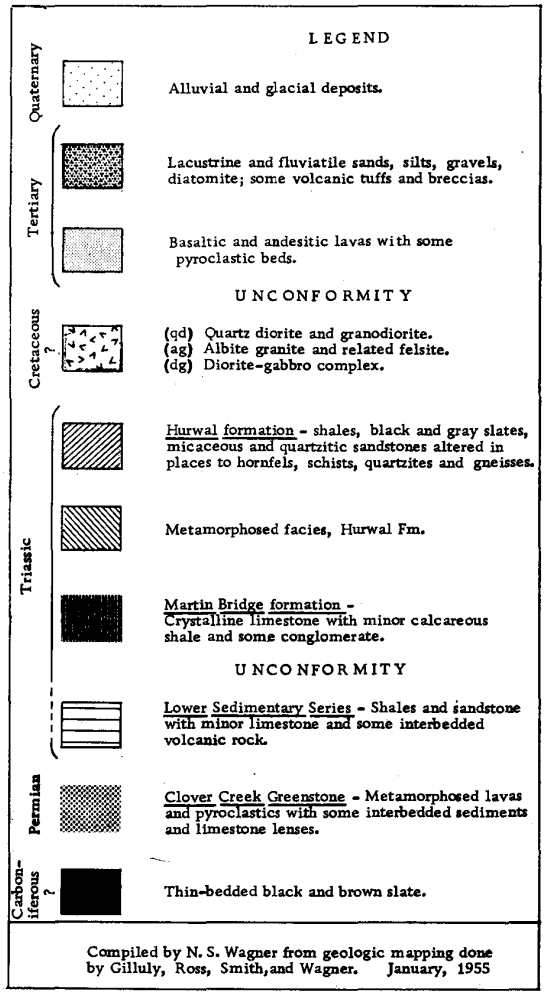
General geology

The Wallowa Mountains were lifted to their present heights by diastrophic processes in late Tertiary-Quaternary time and carved by subsequent erosion into their present picturesque condition. That the normal processes of stream erosion were supplemented by glaciation is manifest by the presence of numerous lakes, hanging valleys, and morainal deposits.

The rock types involved in this mountain building process include lavas of Tertiary age, a wide assortment of both crystalline and sedimentary rock types of Mesozoic age, and a highly metamorphosed series of interbedded volcanic and sedimentary rocks of late Paleozoic age. There are also some sedimentary rocks which may possibly represent an earlier Paleozoic age but there is some doubt as to how they should be correlated.

Description of map units

Alluvial and glacial deposits. These are unconsolidated products of contemporaneous and near contemporaneous sedimentary deposition. Although the alluvial deposition occurs at random elevations, most of the glacial deposition is found only in the higher elevations, generally about 4500 feet.



Lacustrine and fluviatile deposits. The rocks of this unit are extensively developed in the Baker quadrangle but they are shown only in the lower Powder Valley portion of the present map. Gilluly describes the formation as composed of sands, gravels, mud flows, diatomaceous earth, and much volcanic material which grades into tuffs and breccias. He also states that some of the water-laid tuffs occur both beneath the Columbia River lava and interbedded with it and that some even overlie it. From these relationships Gilluly concludes that this lacustrine and fluviatile series is generally contemporaneous with the associated lavas. Fossil evidence indicates that at least some of the sedimentary horizons are of Miocene age. The thickness ranges from a few inches to 1000 feet or more.

Tertiary lavas. These are chiefly basalts and basaltic andesites but appreciable and possibly significant differences in composition and texture occur between the flows found in various places. On the whole the series is thick and is characterized by a succession of flow upon flow with a lack of sedimentary interbeds excepting those just mentioned in the lower Powder Valley. Although exposures like those revealed in the canyon of the Minam River indicate a maximum thickness of between 3000 to 4000 feet of lava it is nevertheless not uncommon to find the formation represented by a single thin flow. This is due partly to the rugged pre-Tertiary relief which influenced emplacement of flows during the period of extravasation and partly to later erosion. In any event these lavas constitute the largest single rock type present in the area, and the main body of the flows is a part of the lava plateau which blankets much of north-central Oregon

and adjacent parts of Washington. The structural attitude of the formation as a whole is characterized by gentle regional dips and mild folds. Feeder dikes are occasionally exposed in the higher portions of the mountains. These dikes are often vertical, or near vertical, and they can frequently be seen and traced for several miles. Ross, Smith, and Gilluly designate the lavas in their areas as "Columbia River Basalt" of Miocene age but evidence within the Telocaset quadrangle indicates that lavas of a younger age may also be present.

Quartz diorite and related crystallines. These rocks make up the second largest rock unit present in the area. They are most extensively exposed in the central portion of the mountains but many outlying exposures occur in the lower foothills as "windows." Composition ranges from quartz diorite and granodiorite to albite granite and gabbro, and the various areas occupied by each are designated separately on the map. The rocks of this group are the youngest of all the pre-Tertiary rocks in the area. The age tentatively assigned by those who have worked in the Wallows is Cretaceous but evidence found in the area of the Idaho batholith, of which the Wallowa Mountains are possibly a part, indicates the age of intrusion may extend from the late Cretaceous into the early Tertiary.

Granitic masses of this type are usually thought to have originated from a molten melt which intruded and stoped its way into the rocks of the earth's crust. However, an increasing amount of evidence indicates that granitic rocks are sometimes formed from pre-existing sediments by a process known as "granitization." Professor Goodspeed of the University of Washington has published several reports outlining evidence which indicates that at least some of the Wallowa Mountain crystallines were formed in this manner.

Hurwal formation. The Hurwal formation is comprised chiefly of clastic sediments which have been metamorphosed to a varying degree in different places in the mountains. Argillaceous sediments are the most conspicuous rock type but coarser sandstone beds are not uncommon according to Smith. Limestone and limy horizons are notably lacking.

The formation is fossiliferous and is Upper Triassic in age. It rests conformably on the limestones of the underlying Martin Bridge formation. As shown on the geologic map, the formation includes Ross' "Younger Mesozoic" sediments and his "Triassic (?) volcanic rocks." Two of the larger areas in which this formation is metamorphosed to an advanced degree are shown separately on the map but it should be remembered that other similarly metamorphosed rocks may be encountered elsewhere in areas too restricted in size to map individually. Thickness is reported as ranging from 0 to 1500 feet.

Martin Bridge formation. This formation is made up almost exclusively of massive beds of limestone and marble. A gray to bluish-white variety is the most common. Other colors are also present among which is the dense black type locally known as "black marble." Many different states of recrystallization exist in accordance with the amount of metamorphism. Well-developed bedding is sometimes prominent but much flow banding of metamorphic origin is also present and is especially well developed near the contacts of more competent rocks. Fossils are fairly common and have served to establish the age of the formation as Upper Triassic. Reports on thickness vary widely. Ross gives a figure of 3000 feet for an exposure near the head of Eagle Creek but Smith states that the overall average is probably around 500 feet.

Lower sedimentary series. Smith describes this series as "Shales, sandstones, with minor amounts of limestone and conglomerate; mostly altered to slate, hornfels, schist, and crystalline limestone." Ross' description is essentially the same but includes mention of some interbedded cherts and lavas, and offers the added information that shades of red, green, and purple represent the typical colors of the sandstones and slates. Both men agree that this series includes a preponderance of sedimentary rocks stratigraphically older than the Martin Bridge formation and that it is separated from the Martin Bridge formation by a strong unconformity. Ross originally correlated the series as being of probable Carboniferous age but qualified this correlation by pointing out that at least some portions of the series were equivalent to, and even younger than, the Permian greenstones and that the series as a whole clearly comprises several formations which cannot

be separated on the basis of the available data. Smith reports that his observations serve to show that the formation is entirely conformable on the Clover Creek formation and that fossil evidence indicates an Upper Triassic age. Estimates of thickness are complicated by folding, faulting, and metamorphism. However, Smith gives a thickness of 2000 feet for the exposures in the Point Joseph area.

Clover Creek greenstone. This name was given by Gilluly to an assemblage of rocks found in the Baker quadrangle made up largely of "altered volcanics and pyroclastic rocks, with subordinate conglomerate, limestone, and chert." These rocks correlate with some of the horizons in the Seven Devils volcanics on the Snake River at Homestead, and fossil evidence has established fairly conclusively that the Clover Creek greenstone is of Permian age. Not all of the many component rock types described by Gilluly are found in the Wallowa Mountain exposures mapped by Ross and Smith, but there is no question concerning the general correlation between Gilluly's rocks and those mapped by Ross and Smith. Some question does exist, however, concerning the proper correlation of the nongranitic pre-Tertiary rocks in the Telocaset quadrangle in T. 5 S., R. 41 E., and in the east half of T. 6 S., R. 42 E. These rocks are shown here as Clover Creek greenstone for convenience, but in the Telocaset quadrangle report the writer has mapped these areas separately as a metasedimentary series because they seem to correlate better with the rocks contained in the Lower sedimentary series than with those belonging to the Clover Creek greenstone. Estimates of thickness of this formation vary but it is agreed that the thickness is in the order of several thousand feet.

Carboniferous (or older?) slates. These are thin-bedded black and brown slates which Ross regarded as the oldest sedimentary rocks in his area. This conclusion was based on structural considerations. Smith feels these slates should be considered as a part of his Lower sedimentary series. They are shown here separately for the reason that Ross mapped them as a separate unit and the occurrence lies outside the area covered by Smith's map. In any event these slates are very restricted in their extent. Ross describes them as having alternating hard and soft streaks and a poorly developed slaty cleavage.

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NOW WE'RE GETTING SOMEWHERE*

Recent introduction in the House and Senate of measures designed to curb abuses of the mining laws without disturbing their basic principles has the support of the Departments of Interior and Agriculture, the Bureau of the Budget, and many users of the public domain....

For many years a continuous barrage of adverse publicity has been leveled at abuses of existing mining laws. The general mining laws have been called archaic and outmoded. Actually, where the mining laws have been abused, the fault has largely lain in lax administration and not in the laws themselves.

Myopic critics have completely overlooked the part our mining laws played and are continuing to play in the development of the West, and in assuring a supply of vital raw materials for our growing civilian economy and the defense needs of our nation, needs that are likely to continue high for the foreseeable future.

It is a basic principle of our mining laws that every American may enter on the public lands to search out mineral deposits. It is also a basic principle that every American having found evidence of mineralization has the right to locate a mining claim and furthermore, when he has invested time and money in the development of such claim to the point where it justifies the granting of a patent, he is entitled to a full "fee simple" title, with the security of tenure and the sound basis for future financing of mining operations which such a title provides.

Our nation depends on mining for its supply of metals, minerals and fuels. Mining, in turn, needs encouragement to explore for and develop mineral deposits. The principles upon which our mining laws were built supply the kind of incentive needed. The industry has never condoned the abuses that have provoked such floods of criticism. Instead it has sought means of curbing those abuses without abandoning the fundamental principles of existing law.

The proposed legislation is the product of intensive work by the Department of the Interior and the Department of Agriculture and conferences between representatives of those departments and of the mining industry. Its enactment would remove the primary causes of abuse of the mining laws and provide for multiple use of the surface of mining claims hereafter located, prior to patent. It would provide the Federal Government a means of clearing up title uncertainties resulting from the existence of abandoned, invalid, dormant or unidentifiable mining claims, while protecting the claim-holder's basic rights. It would guarantee to the miner full rights for prospecting, development and related activities and preserve his right, upon patent, to the same full title to his claim as under the existing mining law.

Enactment of the proposed legislation would solve a problem that has been before the Congress and the public for two decades. It should have the support of every mining man and every user of the public lands.

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*Editorial, American Mining Congress Journal, May 1955.

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NOTE

Readers of newspapers will recall the great hue and cry raised a few years back about the mass locations of placer claims in the Union Creek area of Jackson County. It was stated that the public was being robbed of valuable timber by people using the "archaic" mining laws as a vehicle for the outrageous act. Where did the blame lie? Why of course, according to the allegations, with the mining laws and they must be changed so that absolute control of the surface be given to the Federal Government. The Federal agencies concerned were represented as powerless to prevent such locations. A great many people were led to believe and were encouraged to believe by country-wide propaganda that a person could locate mining claims and acquire timber thereby irrespective of mineral values. What really happened? Mining people - those actually working in the industry - became aroused over the

Union Creek matter. They strongly urged that the Bureau of Land Management and Forest Service invoke the powers given them under the law to rectify abuses such as here alleged by immediately contesting the locations. Administrative machinery was finally set in motion, hearings were held, locations contested, and reports are that the ground located has been or soon will be returned to the public domain. These facts haven't been publicized as the original locations were publicized. One wonders why.

As stated in the A.M.C. editorial, the proposed changes in the mining laws are highly desirable, but the statutes enacted in 1872 together with the later additions to the laws and court interpretations built up over three-quarters of a century are not archaic or outmoded as the propaganda would have people believe. The basic law will not be changed by the amendments proposed, and private enterprise will still be encouraged to prospect for and develop minerals so greatly needed.

F.W.L.

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MINING LAW REVISION

Hearings on seven mining-law revision bills were held by the Mines and Mining Subcommittee of the House Interior Committee on May 19 and 20. The bills were identical except that HR 5577 by Congressman Harris Ellsworth has a provision to assure handling of revenues from O&C Revested Lands as under existing law.

In response to a request for information on progress in the hearings Congressman Ellsworth wired the Department May 20th as follows:

H. M. DOLE. ACTING DIRECTOR OREGON STATE DEPT OF GEOLOGY

1069 STATE OFFICE BLDG PORTLAND ORG

RETEL HOUSE MINES AND MINING SUBCOMMITTEE IN EXECUTIVE SESSION TODAY ORDERED MINING LAW AMENDMENTS REPORTED FAVORABLY TO FULL COMMITTEE FOR EARLY ACTION. FINAL COMMITTEE ACTION EXPECTED TUESDAY. THE BILL APPROVED BY THE COMMITTEE IS HR 5891 BUT WILL CARRY LANGUAGE SIMILAR TO THAT IN MY BILL BRINGING O & C LANDS INTO HARMONY WITH OTHER LANDS AND PRESERVING DISTRIBUTION OF FUNDS FROM O & C LANDS IN ACCORDANCE WITH O & C LAWS. BELIEVE MEASURE WILL BE APPROVED BY SUBSTANTIAL VOTE IN THE HOUSE AT AN EARLY DATE. REGARDS

HARRIS ELLSWORTH MC

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GOLD PLACER SUSPENDS

Wes Pieren and Antone J. Nilson of the Evergreen Mining Company have suspended hydraulic operations on the North Fork of Galice Creek in sec. 3, T. 35 S., R. 8 W., Josephine County. Pieren says that operations could have continued with plenty of water, but that the mine was closed because of the opening of the fishing season and regulations of the Rogue River Coordination Board.

The operation was in a part of a 5-mile line of old channel gravel occurrences trending southwest from just above the town of Galice. The gold-bearing ground is in poorly sorted gravels, sand, and clay with layers of gray to red soil.

Pieren says that the gravels were removed from a rough square of 150 feet. They averaged 5 feet in thickness and barren overburden averaged about 14 feet. A total of more than 100 ounces of gold was recovered by the sluice and by cleaning up with pans. One small nugget of platinum was found. The gold nuggets were flat disc-shaped or elongated, and several weighed more than an ounce and a half each.

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

In the matter of amending certain rules and regulations previously adopted for the conservation of oil and natural gas pursuant to Chapter 520, Oregon Revised Statutes, by the Governing Board of the State Department of Geology and Mineral Industries.

Proceeding No. 2

NOTICE OF HEARING

Hearing will be held in Room 36, State Office Building, Portland, Oregon, on June 6, 1955, beginning at 10:30 a.m. Copies of proposed amendments to the rules and regulations may be secured from the Department at 1069 State Office Building, Portland, Oregon, upon request.

/s/ Mason L. Bingham
Chairman

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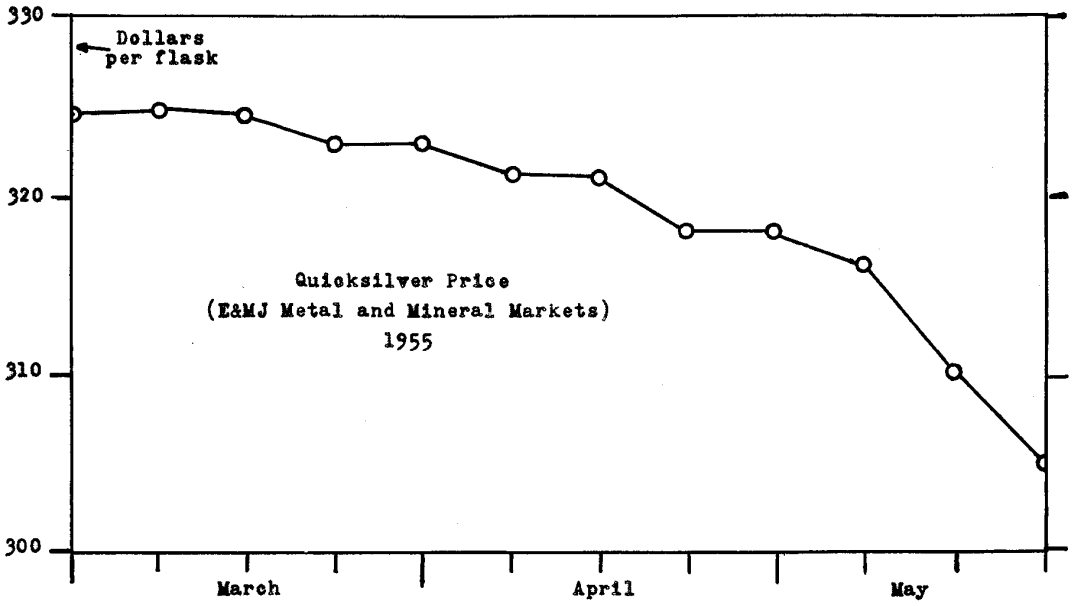
QUICKSILVER

During the past month the market price of quicksilver has been consistently weak as shown by the accompanying graph. According to E&MJ Metal and Mineral Markets, May 19, 1955, Mexican quicksilver sold at $295 for nearby delivery, and consumers are reported to be virtually out of the market because of the price weakness.



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TRIMBLE RESUMES U.S. GEOLOGICAL SURVEY MAPPING

Don Trimble of the Engineering Geology Branch of the U.S. Geological Survey with headquarters in Denver has returned to Portland to resume quadrangle mapping in the lower Columbia River area. During several previous field seasons Mr. Trimble has mapped in this general area including the Portland, Hillsboro, Camas, and Oregon City quadrangles. During the 1955 field season the Boring quadrangle will be added to his mapping program.

The geologic map of the Portland quadrangle together with descriptive text will be published in the U.S. Geological Survey Geologic Map Series probably in 1956. Eventually all five quadrangles will be published in bulletin form.

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