

GEOLOGIC ADVENTURES ON THE LOWER ILLINOIS RIVER, SOUTHWESTERN OREGON

By Len Ramp*

This is the account of a 35-mile boat trip down the lower Illinois River through a rugged and primitive part of southwestern Oregon that few people have seen. The trip was made by Eugene W. Schaffer, Jr.,** and the writer in September 1963, using a 6-man rubber life boat generously loaned by Les Saffer of Selma, Oregon.

The purpose of the trip, in addition to exploring a remote area, was to observe the geology along the canyon walls of the Illinois and to obtain sand samples from tributary streams for geochemical analysis. The sampling is part of a long-range geochemical program being conducted by the Department, results of which will be reported at a later date.

Geology and Accessibility

The lower Illinois River generally flows northwesterly through a remote and mountainous region before it joins the Rogue River at Agness. This region is underlain chiefly by metamorphic rocks of Late Jurassic age, intruded by Late Jurassic to Early Cretaceous ultramafic to granitic rocks. Geologic mapping in the lower Illinois River area east of 124° longitude has been done in fair detail by Wells and others (1948) (see accompanying geologic map). The southwestern part of the area has been mapped on a reconnaissance basis by Wells and Peck (1961) and the northwestern corner by Diller (1914).

Much of the lower Illinois River is either inaccessible or very difficult to reach. From Selma, on U.S. Highway 199, a road extends downstream 18 miles to the vicinity of Oak Flat. From Agness, at the mouth of the Illinois River, a road leads upstream 3 miles to a point near Nancy Creek. A trail connecting these two points follows the river in part, but between Pine Flat and Collier Bar the trail rises over Bald Mountain, leaving a

* Geologist, Oregon Dept. Geology & Mineral Industries, Grants Pass.

** Student, University of Oregon.

14-mile stretch of river completely isolated except by boat (see map).

Between Oak Flat and Agness the Illinois drops approximately 750 feet or an average of 22 feet per mile; however, in a 2-mile stretch southwest of South Bend Mountain the drop is 100 feet. The average rate of discharge as measured on the Illinois near Agness for the 3-year period 1961 through 1963 was 4,000 cubic feet per second, according to the Surface Water Branch of the U.S. Geological Survey.

Early Explorers

The first gold mining in southwestern Oregon was probably done at the mouth of Josephine Creek on the Illinois River in the summer of 1850. Gold was discovered there by a party of prospectors from California, some of whom were originally from Illinois, for which state the river was named (Spreen, 1939). It wasn't until 1852, when gold was discovered on Jackson Creek in Jackson County, that the gold rush into southwestern Oregon began. Gold miners then prospected all of the tributaries of the Rogue and Illinois Rivers, especially those down stream from important placers such as Sailors' Diggings at Waldo and the gravels of Josephine Creek.

These early prospectors found rich gold placers along Briggs Creek and tested each tributary that entered the lower Illinois down stream eagerly searching for "colors." Access to the area was along Indian and deer trails and creek beds. They named Yukon, Klondike, and Nome Creeks after the famous northern rivers in the hope that the same kind of gold discoveries would be made, but except for the placer gold in the headwaters of Silver Creek and a few isolated bars along the main river, such as at Clear Creek, their findings were disappointing.

The first boating venture by white men down the Illinois River was made by three prospectors in August 1857. Their boat was built of hand-hewn Port Orford cedar and was launched at the mouth of Rancherie Creek, which joins the Illinois about 5 miles above Oak Flat. The account of this expedition (published in the Grants Pass Courier April 25, 1924 and in a special edition April 2, 1960) is told by Dan L. Green, first sheriff of Josephine County, who made the trip with Captain O. T. Root and a sailor named Fisher. Green tells of their unsuccessful hunt for gold, various encounters with Indians, and the loss of supplies and equipment when their boat swamped in rapids. He mentions seeing many deer, elk, and large, black timber wolves.

Since those early days, the area has been explored intermittently and with difficulty by prospectors, geologists, and other adventurers.

Account of the 1963 Boat Trip

As nearly as can be determined from available records, ours was the eighth boat trip down the Illinois River since Captain Root's expedition 106 years ago. The low water of late summer made necessary more portages than would have been required earlier in the season, but a larger stream flow would have greatly increased the turbulence and of course the hazards. The rubber boat proved to be a most satisfactory means of transportation.

Forty-four samples of sand collected from tributary streams are now being analyzed in the Portland office for traces of copper, zinc, and molybdenum. If anomalous amounts of any of these indicator metals are found, the sample source will be investigated further.

From field notes and data plotted on quadrangle maps during the trip, together with a later study of aerial photographs, it was possible to make slight revisions in previous geologic mapping and add some new information for the area west of 124° longitude, where only reconnaissance work had been done.

A daily record of the boat trip and the geology encountered between Oak Flat and Agness follows.

First day (Tuesday, September 10):

Norman Peterson, geologist at the Department's Grants Pass office, drove Gene Schaffer and me down the Illinois River to the end of the road at Oak Flat and arranged to meet us at Agness on Friday evening, 3½ days and 35 miles later.

We packed our bedding, food, and equipment in water-proof plastic bags and stacked them on inflated air mattresses on the floor of the rubber boat. About 2:30 o'clock in the afternoon we finally got under way in our flimsy little craft.

Geologically, we started out near the west edge of the small granodiorite stock which underlies the Oak Flat area. Soon we were looking up at a slightly older, darker, and more resistant hornblende diorite (see geologic map and cross section). These rocks stand in bold relief and in most places form very steep canyon walls. Most of the hornblende diorite (as it is mapped by Wells and others, 1948) is gneissic and in places appears to be recrystallized. The gneissic banding is variable, but generally it dips steeply and strikes northerly. The canyon walls weather to steep rugged slopes with jumbled boulders and talus at the base. Dense timber covers the south walls of the canyon, but vegetation is sparse on the north side (south slope) with the exception of lush, large-leaved water plants ("wild rhubarb") which mark locations of side streams and springs.

When taking sand samples from some of the small side streams it was necessary to climb steep canyon walls to reach their hanging valleys above flood-stage deposits of the main stream. Only the larger, heavier-flowing tributaries have kept pace with downcutting erosion of the main canyon.

During the first day we covered a little less than 3 miles, and set up our camp just before dark on a gravel bar a short distance upstream from Hayden Creek (see map). That first afternoon we had encountered an average of four difficult-to-impassable riffles per mile of river and found it necessary to make portages just below Panther Creek, at Nome Creek, and near our first night's camp site. The other riffles were shallow and by wading, lifting, pushing, and roping through swift, more hazardous stretches, we managed without unloading the boat. From the first day's progress, we realized it was going to be difficult to go the planned distance in the allotted time.

Second day (Wednesday, September 11):

About noon on the second day we arrived at Clear Creek. Here we met Mr. Noble, an elderly prospector who lives alone in a cabin on a mining claim at the mouth of the creek. He was the only person we were to see for four days.

Continuing downstream to Pine Flat, we came to a light-colored, coarse-grained granodiorite similar to that exposed at Oak Flat. The less resistant granitic rock accounts for the flat areas where gravel bars are built up on both sides of the river (see Figure 1). Pine Flat was named by Captain Root, member of the first boat expedition. In those days the flat area was covered with grass and tall pine trees. The remains of an early settlement are located on this flat. According to Josephine County records, M.D. Weaver patented the property as a homestead in 1919. He first raised pigs and later cattle. He sold the property in 1939.

Some curious otters watched us as we worked our way through the rapids above Pine Creek. For the next two days of our journey the otters kept popping up to watch us and sound their shrill whistles. We enjoyed their elusive company and amusing appearance, but we had the feeling they were just waiting for us to capsize so they could have a good laugh.

Downstream from the Pine Flat gravel bars dark green to black altered basaltic rocks of the Dotham Formation are exposed. There are also boulders of bright-red chert in a landslide block of reddish-brown brecciated basalt just below Florence Creek. Some polishing quality red jasper with green tint was also found at this location.

We covered a distance of 6 miles this second day and the going was equally as rough as on the previous afternoon, with numerous difficult rapids.

Our Wednesday night camp was on a gravel bar at the mouth of Klondike Creek. Plenty of dry, flood-deposited driftwood was available for our campfire.

Third day (Thursday, September 12):

Before starting out Thursday morning, we patched the existing holes in our boat. Then, using some poles and old boards containing nails that we found in the driftwood, we improvised a rack to hold our gear off the bottom of the boat to lessen the chances of punching more holes.

Below Klondike Creek the river has carved a rugged and beautiful canyon in massive graywacke sandstones, typical of the Dothan Formation. We drifted along magnificent stretches where deep placid pools mirrored the bold rocks, dense timber, and the sky. Between stretches of quiet water there were treacherous, thundering rapids which required that we either rope through or portage around (see Figure 2). On one occasion we unexpectedly careened off a rock and were whipped backwards over a small waterfall formed by a log. Except for shipping some water, we came through the breath-taking experience undamaged.

We covered nearly 8 miles on Thursday. From Klondike Creek we worked our way down river to the northwest for about 3 miles, then around a bend to the southwest. Here the river follows the strike of the Dothan Formation for about 4 miles; its southerly course is controlled by a less resistant horizon of interbedded siltstone and sandstone dipping steeply eastward. The interbeds of dark siltstone looked favorable for fossils, but we were unsuccessful in finding any.

Massive graywacke sandstone of the Dothan Formation crops out in the steep bluffs on both sides of the river and underlies South Bend Mountain, a high, timbered ridge paralleling the river to the west.

At the south end of South Bend Mountain the river again turns northwestward abruptly and crosses the massive Dothan sandstone, which in this area contains some lenses of highly resistant chert. Downstream from the turn we found the steep and narrow canyon so choked with large boulders that it was nearly impassable. The boulders, some as much as 30 feet in diameter, are remnants of recent landslides which brought large quantities of rock and earth into the gorge and nearby tributary streams. We had been through many tough places before this point, but so far this was the most difficult part of our strenuous trip. The footing was precarious as we crawled and slipped between, over, and around the wet boulders. After a portage of 1,000 feet we set up our camp for Thursday night at a point about 1 mile downstream from the river bend. We noted large, fresh tracks of a lone wolf cutting across the sand near our campsite. The sky was

overcast and we expected rain, so we fashioned a tent by setting the boat on edge and fastening a 10-by-12 foot plastic tarpaulin to it. If our four-footed friend returned to look us over that night, we were too tired to care.

Fourth day (Friday, September 13):

Friday the 13th turned out to be the toughest day of all. We were under way by 8:30 a.m. and by 6:30 p.m. we had covered only 4 miles. The first mile took most of the day. We lost track of the number of portages that we were forced to make in this area of steep stream gradient and clusters of huge boulders.

About a mile upstream from Collier Creek we noted a definite change in the Dothan Formation. We were now traversing an area where, as mentioned earlier, only reconnaissance mapping had been done. As we progressed westward, the rocks were more highly fractured and altered to greenstone, probably representing in part altered lavas of the Dothan Formation. The rocks gradually became more impregnated with white seams of quartz, feldspar, sericite, and saussurite(?). In the vicinity of Collier Creek and Collier Bar (see Figure 3) the rock has been altered to gneiss containing many narrow seams and dikes of diorite which may represent completely recrystallized portions of the original rock or perhaps fingers of primary igneous rock injected from an underlying magma. These rocks are believed to be a northern extension of those exposed in the Big Craggies, called "Craggy gneiss" by Butler and Mitchell (1916) and classified as "gneiss and schist derived from the Dothan Formation" by Wells and Peck (1961). A more careful study of exposures along this part of the river may reveal the true relationship of this gneiss to the Dothan Formation.

Extremely weary, we set up camp at nightfall on the east bank of the river 1 mile downstream from Collier Creek, knowing that Norm Peterson was looking for us at Agness. Our food supply was getting low and we still had more than 12 miles to travel.

Fifth day (Saturday, September 14):

Fortunately, the going was easier on this day and we ran the rapids with the growing confidence of experience. In calmer stretches it was necessary to paddle steadily to overcome an increasing upstream breeze.

This final lap of the trip took us through some of the more interesting geology and past the only mineralized area seen. Two patches of red iron-oxide stain exposed on the east bank of the river $1\frac{1}{2}$ miles downstream from Collier Creek mark the location of mineralization. At the first area of coloration, which is about 40 by 50 feet in size, we noted massive lenses

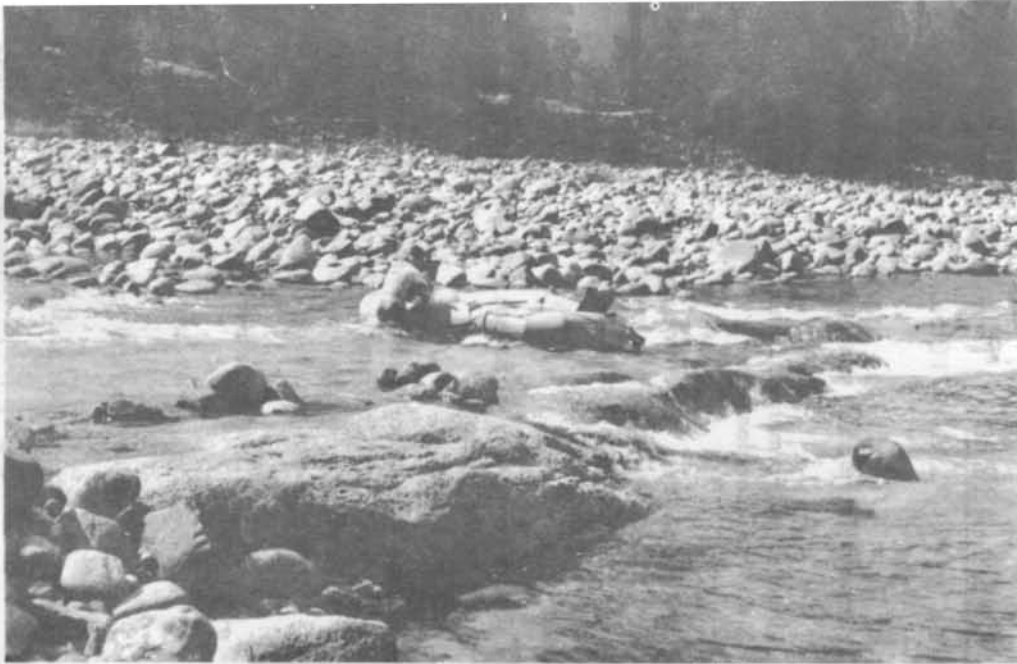


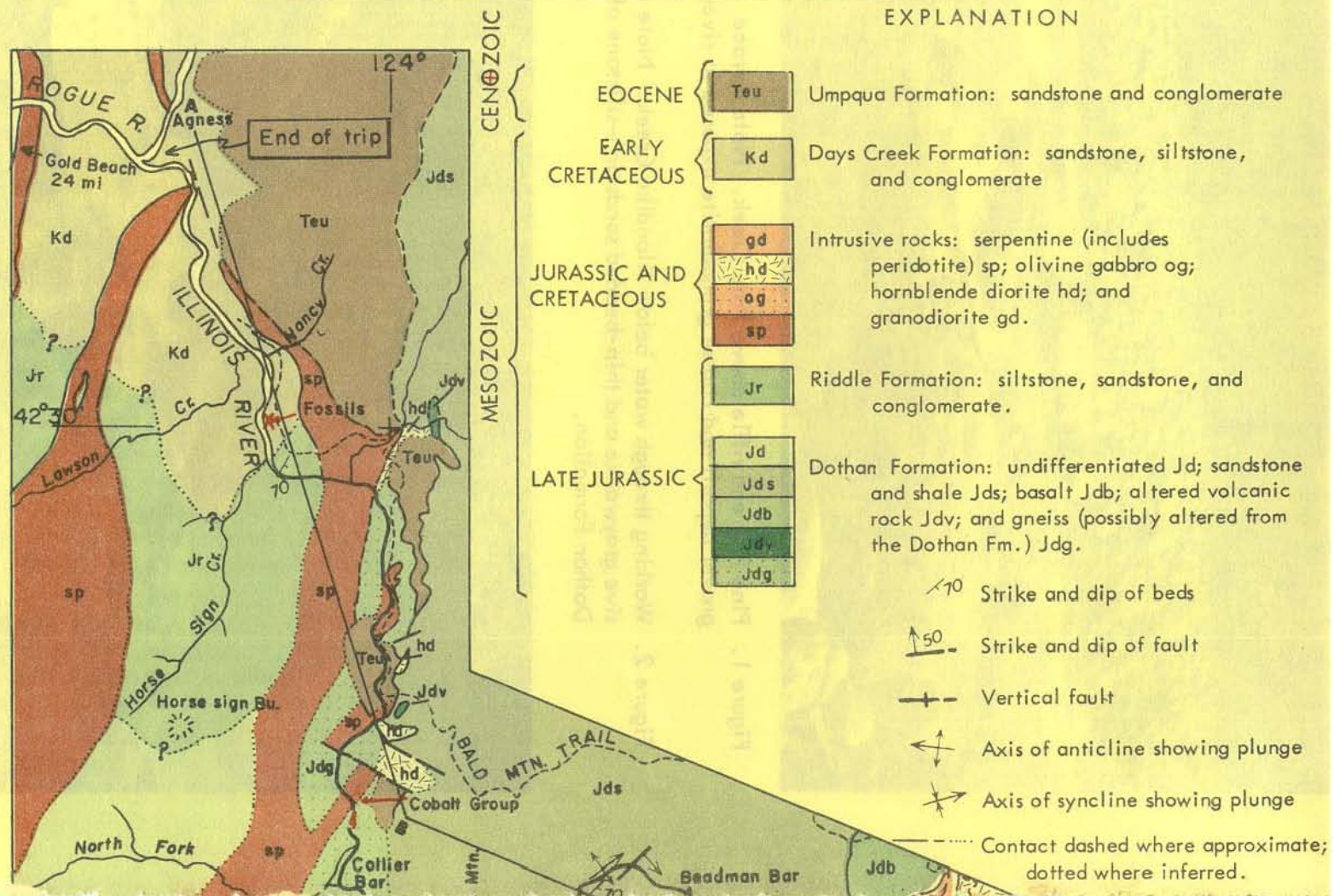
Figure 1. Pine Flat and riffle above Pine Creek. Note terrace gravel deposit and coarse granodiorite exposed in river.

Figure 2. Working through water below Klondike Creek. Note massive graywacke and thin-bedded sandstone-siltstone of Dothan Formation.



GEOLOGIC MAP — LOWER ILLINOIS RIVER AREA

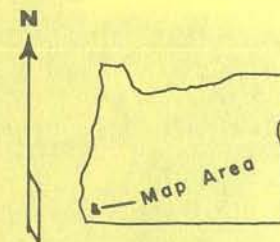
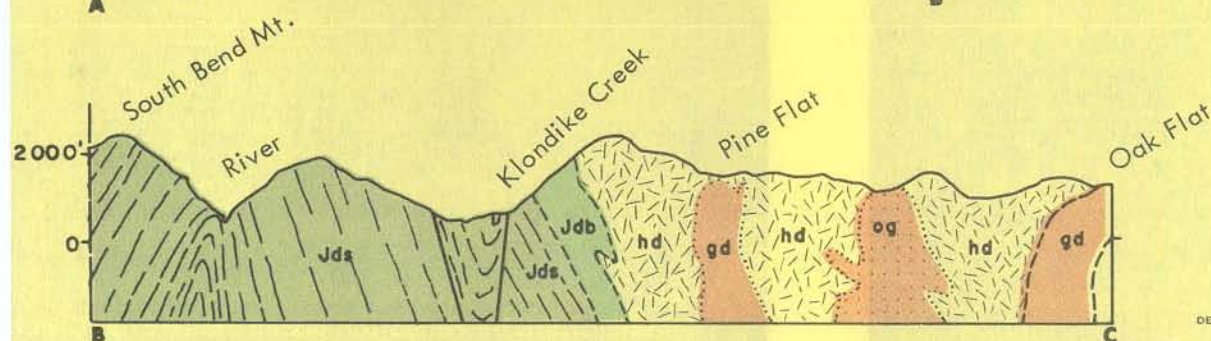
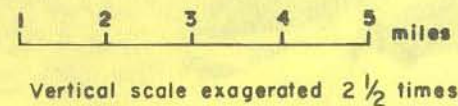
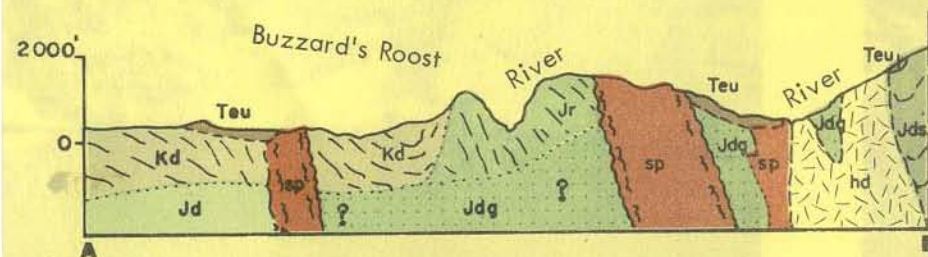
EXPLANATION





GENERALIZED GEOLOGIC SECTIONS

Adapted from: Diller, 1903
Wells, Hotz, and Cater, 1949
Wells and Peck, 1961



Map prepared by
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

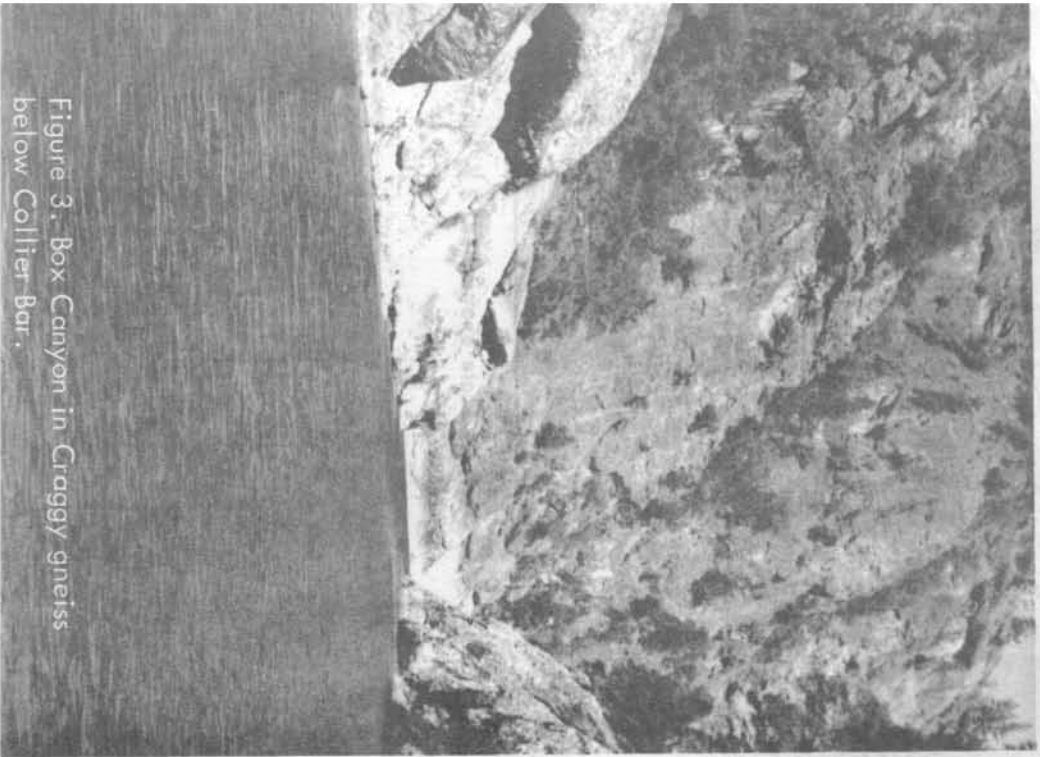


Figure 3. Box Canyon in Craggy gneiss below Collier Bar.



Figure 4. Steeply dipping pebbly sandstone and siltstone of Riddle Formation above Horse Sign Creek

and streaks of sulfides (largely pyrrhotite) as much as 4 feet thick, interspersed with disseminated pyrite and chalcopyrite in a siliceous matrix. A short distance downstream to the north a more extensive area of iron-oxide stain, which we did not examine, crops out in the steep bank in the form of a lens-shaped body about 50 by 175 feet in size.

The mineralization occurs in or near the contact of serpentine and gneiss and is undoubtedly part of a larger deposit described as the Cobalt Group by Parks and Swartley (1916). A sample of sulfide-bearing rock (P-20998) reportedly taken from this occurrence by a prospector in 1957, assayed 0.20 percent copper and traces of gold, nickel, and cobalt.

About 3 miles downstream from Collier Creek we came to a nearly horizontal sandy conglomerate lying unconformably on the eroded top of the gneiss and serpentine. Where viewed, the formation has a northerly strike and gentle dip west. Wells and others (1949, p. 15) map and describe similar sedimentary rocks nearby on the east side of the river in the northwestern edge of the Kerby quadrangle as belonging to the Arago group (Umpqua equivalent) of Eocene Age.

Serpentine exposed near the mouth of Indigo Creek is highly sheared and probably represents a fault zone. Between Indigo and Horse Sign Creeks we noted steeply dipping marine sedimentary beds of the Late Jurassic Riddle Formation consisting largely of sandstone, siltstone, some pebbly sandstone, and conglomerate (see Figure 4).

Near Horse Sign Creek, the approximate contact of the Riddle and Days Creek Formations, we found a few fragmentary fossil gastropod and pelecypod shells, but did not make a collection. Norm Peterson, who walked up to Horse Sign Riffle looking for us Friday evening, collected some specimens of the pelecypod Buchia crassicollis (Keyserling) from a point on the east side of the river about half a mile downstream from Horse Sign Creek. Imlay and others (1959) assign sedimentary rocks in southwestern Oregon containing Buchia crassicollis (Keyserling) to the Early Cretaceous Days Creek Formation. Wells and Peck (1961) map both the Riddle and Days Creek Formations (subdivisions of the Myrtle Group) along the Illinois River south of Agness. Both the Riddle and Days Creek Formations dip steeply and in places appear to be overturned.

Just before dark on Saturday we made one last portage over the temporary fill where the new bridge is being constructed across the mouth of the Illinois River. Tired, cold, wet, and looking like a couple of unkempt prospectors, we entered the Larry Lucas Lodge at Agness. Norm Peterson apparently had complete faith in our ability to reach our destination, for the owners of the lodge were expecting us and greeted us with warm hospitality and an abundance of good food, which, needless to say, we thoroughly enjoyed.

Bibliography

- Butler, G. M., and Mitchell, G. J., 1916, Preliminary survey of the geology and mineral resources of Curry County, Oregon: Oreg. Bur. Mines & Geology, Mineral Resources of Oregon, vol. 2, no. 2.
- Diller, J. S., 1903, Port Orford Folio No. 89, U.S. Geol. Survey Geol. Atlas.
- _____, 1914, Mineral resources of Southwestern Oregon: U. S. Geol. Survey Bull. 546.
- Imlay, R. W., Dole, H. M., Wells, F. G., and Peck, D. L., 1959, Relations of certain Jurassic and Lower Cretaceous formations in southwestern Oregon: Am. Assoc. Petroleum Geologists Bull., vol. 43, no. 12.
- Libbey, F. W., 1963, Lest we forget: The ORE BIN, vol. 25, no. 6, p. 93-109.
- Parks, H. M., and Swartley, A. M., 1916, Handbook of the mining industry of Oregon: Oreg. Bur. Mines & Geology, Mineral Resources of Oregon, vol. 2, no. 4.
- Spreen, C. A., 1939, A history of placer gold mining in Oregon, 1850-1870: Oregon Univ. master's thesis, unpublished.
- U.S. Bureau of Mines, 1945, Horse Sign Butte iron deposits, Curry County, Oregon: U.S. Bureau of Mines War Minerals Report 412.
- Wells, F. G., Hotz, P. E., and Cater, F. W., Jr., 1949, Preliminary description of the geology of the Kerby quadrangle, Oregon: Oregon Dept. Geology and Mineral Industries Bull. 40.
- Wells, F. G., and Peck, D. L., 1961, Geologic Map of Oregon West of the 121st Meridian: U.S. Geol. Survey, Misc. Geol. Inv. Map 1-325.

* * * * *

WILDERNESS BILL PASSES HOUSE COMMITTEE

The House Interior Subcommittee on Public Lands has passed H.R. 9070 (see May ORE BIN) for a National Wilderness Preservation System.

* * * * *

AMERICAN MINING CONGRESS CONVENTION

September 13-16, 1964

PORTLAND, OREGON - "WORLD SEAPORT OF THE PACIFIC"

HATFIELD CHAIRMAN OF 1965 CONFERENCE

Governor Mark O. Hatfield (Oregon) was elected chairman of the Western Governors Conference for 1965 at the Western Governors Conference held May 3-6 in San Francisco, California. The 1965 meeting will be held in Portland June 10-12

The San Francisco meeting passed 20 resolutions, of which seven dealt directly with the mineral industry. The longest, which came out of Governor Hatfield's Committee on Natural Resources, is as follows:

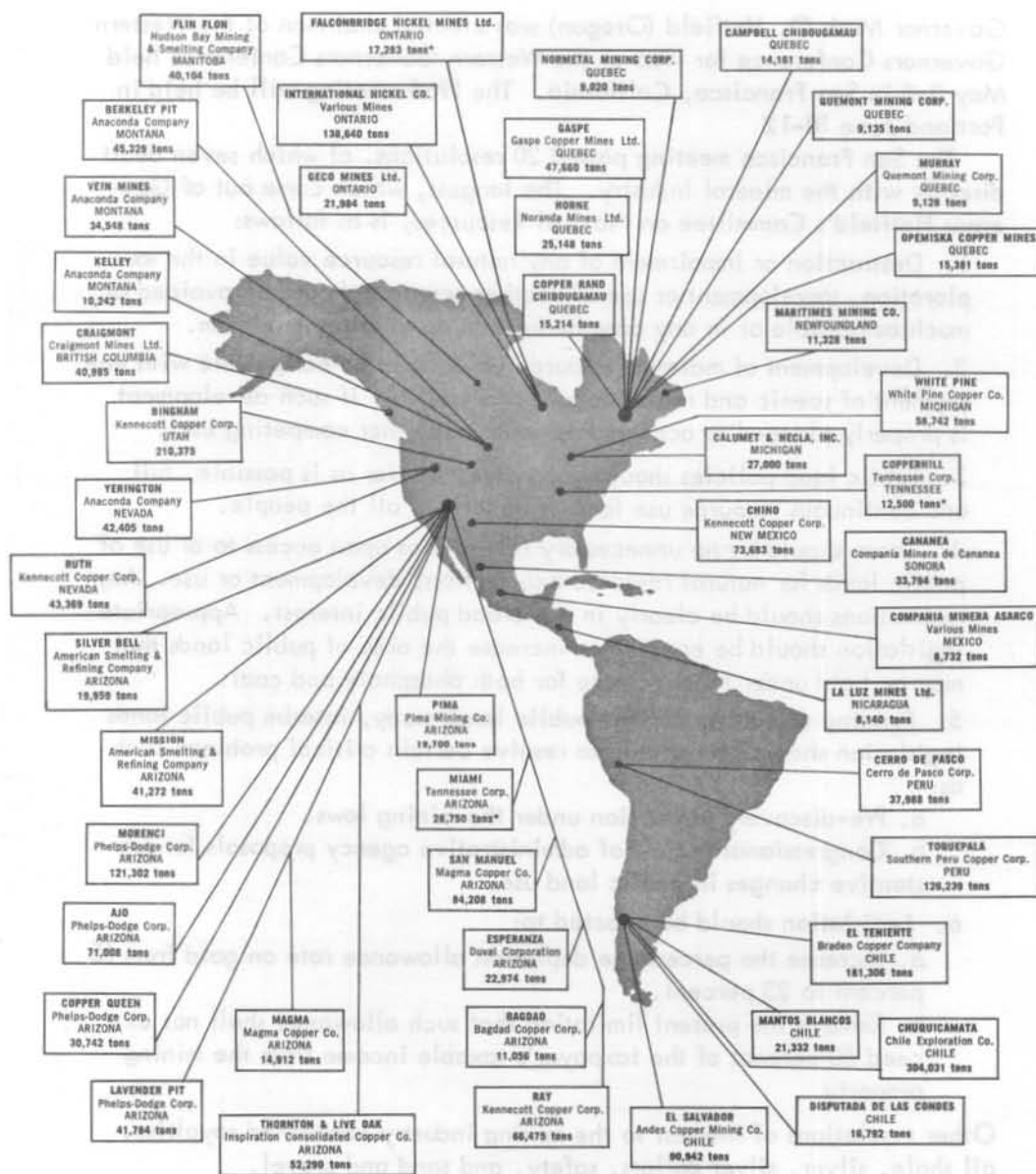
1. Destruction or impairment of any natural resource value in the exploration, development or use of another resource should be avoided as much as possible or in any case be kept to an absolute minimum.
2. Development of material resource values can be compatible with enjoyment of scenic and recreational opportunities, if such development is properly planned to accomodate these and other competing uses.
3. Public land policies should guarantee, insofar as is possible, full and continuous resource use for the benefit of all the people.
4. There should be no unnecessary restrictions upon access to or use of public lands for natural resource exploration, development or use. Any restrictions should be clearly in the broad public interest. Appropriate legislation should be enacted to increase the area of public lands that may be held under federal lease for both phosphate and coal.
5. Pending completion of the public lands study, interim public lands legislation should be enacted to resolve certain critical problems such as:
 - a. Pre-discovery protection under the mining laws.
 - b. Congressional review of administrative agency proposals for substantive changes in public land use.
6. Legislation should be enacted to:
 - a. Increase the percentage depletion allowance rate on gold from 15 percent to 23 percent.
 - b. Remove the present limitation that such allowance shall not exceed 50 percent of the taxpayer's taxable income from the mining property.

Other resolutions of interest to the mining industry concerned royalties, oil shale, silver, silver dollars, safety, and sand and gravel.

Just prior to the Western Governors Conference, the Western Governors Mining Advisory Council (DeWitt Nelson, Chairman, California) met in San Francisco in order to work with the Conference.

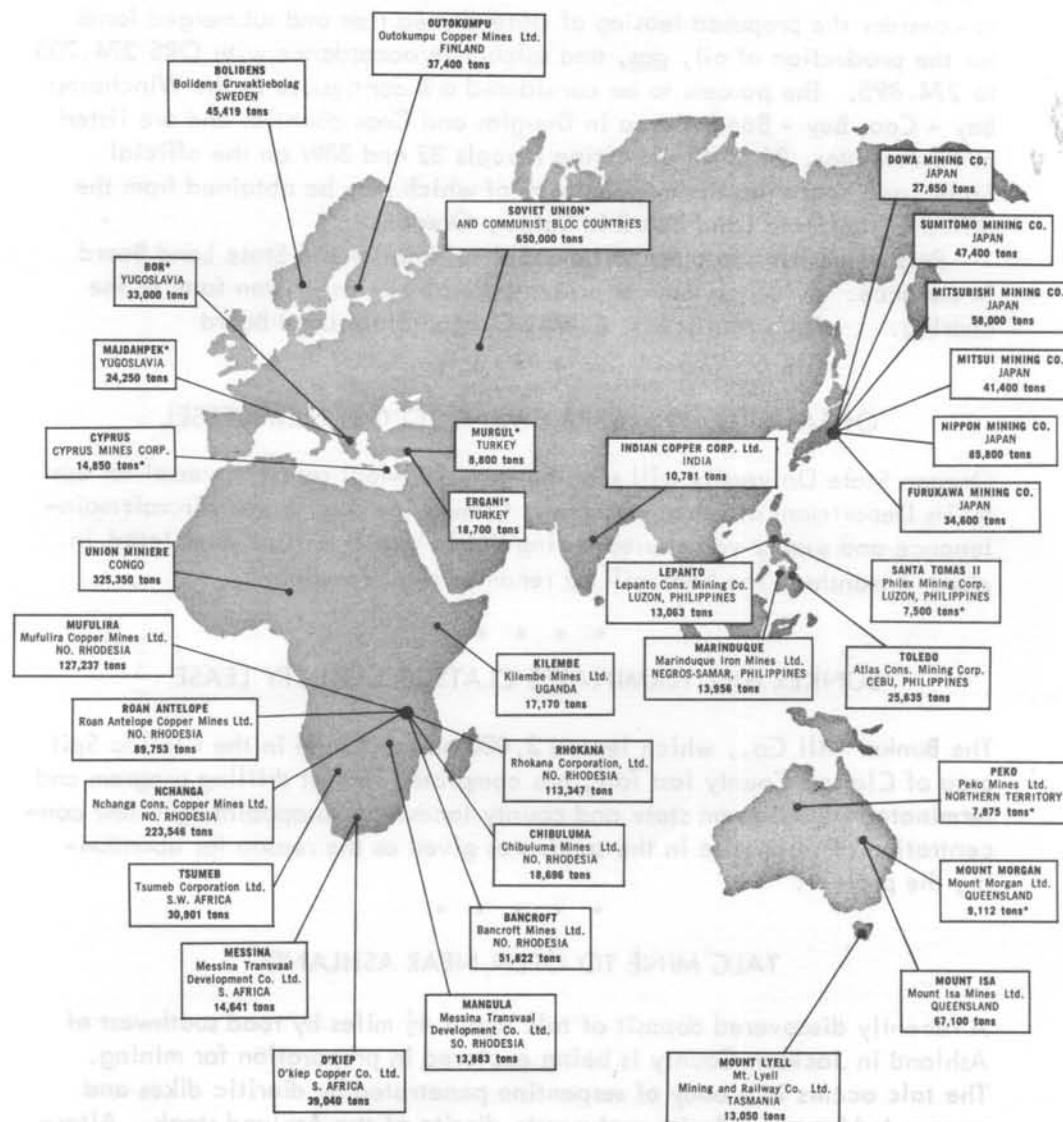
* * * * *

PRINCIPAL COPPER PRODUCERS



Map shows 1962 copper production of mines producing 7,500 (or more) short tons of metal in concentrates (Courtesy of American Cyanamid Co., New York).

OF THE WORLD IN 1962



NOTICE OF PUBLIC HEARING

Notice is hereby given of a public hearing to be held beginning July 28, 1964, at 10 a.m. in the Council Room of the City Hall, Coos Bay, Oregon, to consider the proposed leasing of state-owned tide and submerged lands for the production of oil, gas, and sulphur in accordance with ORS 274.705 to 274.895. The parcels to be considered are contiguous to the Winchester Bay - Coos Bay - Bandon area in Douglas and Coos counties and are listed as Parcels Nos. 24 to 40 excepting Parcels 32 and 33W on the official State Land Board leasing map, a copy of which may be obtained from the office of the State Land Board in Salem, Oregon.

Persons desiring to offer testimony should notify the State Land Board in advance. Evidence may be presented orally or in written form at the hearing. Dale Mallicoat, Clerk, Oregon State Land Board

* * * * *

OCEANOGRAPHY DEPARTMENT TO GET NEW VESSEL

Oregon State University will soon have an 180-foot research vessel for use by its Department of Oceanography. Conversion of a former aircraft maintenance and supply vessel used during World War II will be completed in about 4 months. The boat will be renamed the "Yaquina."

* * * * *

BUNKER HILL TERMINATES CLATSOP COUNTY LEASE

The Bunker Hill Co., which leased 3,000 acres of land in the Clatsop Spit area of Clatsop County last fall, has completed its test drilling program and terminated its leases on state and county lands. A disappointingly low concentration of magnetite in the sands was given as the reason for abandoning the project.

* * * * *

TALC MINE TO OPEN NEAR ASHLAND

A recently discovered deposit of talc about $4\frac{1}{2}$ miles by road southwest of Ashland in Jackson County is being explored in preparation for mining. The talc occurs in a body of serpentine penetrated by dioritic dikes and surrounded by granodiorite and quartz diorite of the Ashland stock. Alteration of the serpentine along the dikes has produced the talc which in some places is 4 feet wide. The property is owned by L. A. Bratcher, Ashland, a well-known mine operator. Tom Carrithers, Santa Cruz, California, is doing the exploration work.

* * * * *