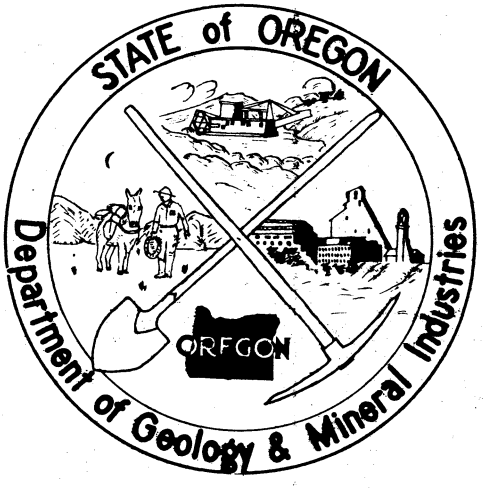
STATE OF OREGON
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

PORTLAND, OREGON

THE ORE.-BIN

VOL. 10 NO. 1 PORTLAND, OREGON January 1948



January 1948 Portland, Oregon

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
Head Office: 702 Woodlark Bldg., Portland 5, Oregon

****

SNAKE RIVER PASSAGE*

By

F. W. Libbey

"Neither snow, nor rain, nor heat, nor gloom of night stays these couriers from the swift completion of their appointed rounds." This oft-repeated quotation might be supplemented on the pennant of the "Idaho" by the words "and no Snake River rapids will prevent delivery of the U. S. mail by mailman and freighter, Capt. Kyle McGrady." Capt. Kyle in his river boat "Idaho" delivers mail to ranchers and miners on the banks of the Snake River through 50 miles of canyon and innumerable white-water rapids in that inaccessible, little-known region between the mouth of the Grande Ronde and Johnson's Bar, from 40 to 93 miles south of Lewiston, Idaho.

The "Idaho" is 58 feet long, flat-bottomed for shallow draught, and is driven by two independent powerful Diesel engines. There is a small pilot house and the rest of the boat is practically all combination hold and cabin designed to carry a maximum load of freight. And a surprising amount of freight - mainly sacks of wool - it can carry.

Regular mail trips are made each week, leaving Lewiston Friday and returning Saturday. Those are long hard days for Capt. Kyle and his one-man "crew," for navigating the Snake after dark just isn't done, and in order to complete the trip on schedule it is necessary to take advantage of every minute of daylight.

The boat pulls away from its modest dock and warehouse at Lewiston at 6 A.M. sharp and if you want to take the trip, don't get there at 6:01.

Out into the turbid current without any backing or filling throbs the "Idaho," Capt. Kyle at the wheel, and the Snake River trip up to Hells Canyon begins as any other boat trip begins. The river is in something of a hurry to get to the Columbia, but it is an orderly hurry and the "Idaho" pushes along at a regular gait.

The passengers - maybe fifteen or twenty - distribute themselves around as fancy dictates. Three or four maybe are in the pilot house with McGrady; the rest may either sit on a bench in the cabin or drape themselves on the cat walk around the cabin. A favorite place in good weather is on the deck over the cabin where one may recline on a bedroll or sit on the edge with feet hanging over the cat walk.

Your fellow passengers will be mainly ranchers or miners returning to their homes on the up-trip and visiting the city on the down-trip, but, more likely than not there will be a tourist or two, maybe a couple of mining engineers, even perhaps a representative of a national magazine of wide circulation with his photographer and a Forest Service supervisor. In any event, there will be an interesting group, some of whom will experience your thrills in your first trip into the canyon of the Snake.

The first 40 miles or so will be interesting but relatively tame, for you feel still in civilization. After leaving Lewiston and its sister city, Clarkston, on the Washington side of the river (yes, Lewis and Clark crossed the river here), you'll see some cultivated land but mostly grazing land - no timber - up to and beyond the sleepy little town of Asotin,

---

*Reprinted from Ore.-Bin, July 1942, by request.

Washington, eight miles from Lewiston. A few miles beyond Asotin, on the Idaho side, some basalt cliffs show a varied assortment of columnar jointing. Some twisted patterns, roughly spiral-shaped, are worth a picture or two.

On 30 miles or so up the river without much change in scenery. There are two or three places where the water is fairly swift, but easily navigated compared to the upper river.

Then you reach little Rogersburg at the mouth of the Grand Ronde River which comes in all the way from the Blue Mountains and Wallowas in Oregon. Here the "Idaho" makes a stop - no piers or floats are necessary; at this, as at all other stops on the upper river, she just noses into the bank and holds on.

From Rogersburg you begin the real Snake River canyon trip. Here the mountains close in on the narrowing river. Here also are great beds of limestone on both sides of the river - destined some day probably to be quarried and put to industrial use.

Soon you come to some real rapids and McGrady grips the wheel, turning it quickly so that the bow hits the current at just the right angle. The boat keels over, a big splash of spray comes over the bow, you grab a hand-hold somewhere and brace yourself. The boat slows up, then digs in as the propellers churn, and slowly crawls up the swiftest part. You wonder if there will be swifter rapids above and you hope nothing happens to an engine or a propeller while she's battling up one of these rapids. There are too many rocks a bit too close for comfort.

One rapid follows another in fairly regular but far from monotonous succession. You begin to feel confidence in the "Idaho" and her captain; you don't grip the hand-hold quite as rigidly - "roll with the punch" as it were and grin as the spray hits a fellow passenger.

The sides of the canyon are fairly steep - all rock, no timber. The only exceptions are the occasional gravel bars accumulated along some bends in the present river, and those old flat stream terraces, sometimes several acres in extent, up to thirty or forty feet above present high water mark. These latter terraces represent ancient levels of the river and stand as mute evidence of the history of all such streams which are slowly but constantly wearing their channels downward.

A few of the gravel bars and terraces are being placered by "snipers." The equipment required is simple and everything about their lives is simple. They are not concerned about priorities, governmental regulations, excess profit and income taxes, rent, fuel, gasoline, movies, blackouts, and the various other advantages we enjoy in our so-called civilized communities. These "snipers" have three main concerns, namely, food, clothing, and McGrady's boat, and of these, perhaps McGrady's boat is paramount. It is their only connection with the outside world. Just to see it go by is proof that their communication line is intact and that they can go out into the land of Broadways and bright lights any time they choose. A white flag on the bank will bring the "Idaho" to the shore.

Snake River gold has a none too good reputation based on many disappointments and failures. One can pan it from all gravel bars but it is so finely divided that the quantity seen in a gold pan gives a magnified idea of the real weight. Report has it that the snipers on Snake River are doing well when they recover two or three dollars a day. The average is probably much less than that. But theirs is an independent breed, and they possess much that we in the city have exchanged for carbon monoxide, drunk drivers, and epidemics. No regimentation for them. And boy, there's some swell fishing and hunting up in that country.

A landing on the Idaho side where a woman comes aboard to confer with McGrady about buying a money order; an old prospector is waiting to mail a mineral sample; he engages the "crew" in earnest conversation about this discovery, as prospectors will; you think of the Ancient Mariner; sample appears to be graphite - probably too much iron.

Time and the "Idaho" wait for no man; the prospector's discourse is cut off; the gang-plank is hauled in and McGrady heads up stream.

More rapids; more landings to deliver mail; some passengers get off; nearing mid-day, the mouth of Salmon River is passed. It's called "the river of no return." Don't know why, but the appellation is sufficiently descriptive to suggest an Indian legend. At any rate, the Salmon, a very husky member of the Snake family (if you'll overlook the biology of the admittedly poor figure of speech) boils down out of the high mountains of central Idaho in considerable volume.

Well, it's time for coffee and sandwiches. Hope you've brought along sandwiches, for something about the scenery or mental exertion of helping to push the "Idaho" up the rapids gives you a swell (or is it "swollen"?) appetite. Besides you had breakfast at 5 A.M. McGrady's "crew" lights the gasoline stove in the cabin and supplies the coffee in a big coffee pot. You stand around waiting for the darned thing to boil. Pretty soon you get a sniff of the coffee; you wish to appear disinterested; didn't Robert Louis Stevenson say "It is better to anticipate than to arrive"? Let the rest anticipate all they want; you want the coffee. You have your own cup ready and waiting - better be safe and have your own sugar, too. Finally the coffee is ready - wait your turn - page Emily Post - maybe they'll trample the "crew."

Well, that primal urge to consume all the food and drink in sight seems to have given way to a feeling of well-being and you can again view the river without the distraction of hunger. Say, that coffee was good.

The "Idaho" keeps right on moving up the river - more rapids. The rock walls are getting higher - you guess that they slope up to 1500 or 2000 feet at the apparent summits. Some of the walls are sheer for a few hundred feet; others have a 30 to 40 degree slope. Once in a while a little creek comes rushing in.

Now McGrady eases into Eureka landing just below the mouth of the Imnaha River. A pack train meets the boat for supplies and mail. Three fishermen get on with their outfits, evidently bound for some fishing stream up the river.

Eureka is a ghost town with only the ghost remaining. The foundations of an old mill can be seen; nothing more. Report has it that a mining company attempted production of copper ore and concentrates in the early part of the present century. A great deal of money was spent - not warranted by ore developed. A steamboat costing $65,000 was built; wrecked on the first trip.

The Imnaha is at flood stage and muddy - very swift as far up as you can see. Quite a river although not in the same class as the Salmon.

Next stop is Fargo Landing a half mile above the mouth of the Imnaha where some men get off with camp equipment. They will set up camp for the engineers who are to make some mineral investigations.

Out into the current again and a short distance up to Divide Creek on the Idaho side. Fine looking fishing stream; ought to be some real trout in it. Now you approach Zig Zag rapids in an S-curve of the river. Here the "Idaho" labors. You watch a mass of rocks jutting out from the shore on your right. The boat is not moving and seems to be getting pretty close to the rocks. This would be an uncomfortable moment and place for something to happen to the engines or propeller shafts, but there's a little reserve of power left and you see that the boat is now edging forward. That's a relief.

A couple of stops at one of which the fishermen disembark and then Pittsburg Landing, on the Oregon side, where there are many sheep and much bleating. Shearing is in progress and McGrady investigates as to how much wool he will have to load on the return trip.

Well, must hurry along; there are dark clouds gathering and distant rumblings promising a storm. More mail is left at landings and you begin to think of supper and of tying up for the night. But first an important matter must be attended to. The Snake is famous for its sturgeon and McGrady likes to set out sturgeon lines in the evening on the way up. Night is the feeding time for sturgeon, and the lines may be collected on the way down the next morning.

The favored place for setting a line is a fairly deep eddy. A small hemp rope is the line and three large hooks, each on a separate piece of line a foot or so long, are attached to the main line at intervals of a couple of feet starting at about that distance from the rock weight. Each hook is baited with a third of an eel. (McGrady carries live eels obtained at Lewiston in an eel box on the stern of the boat.) The boat heads into shore at the selected eddy. The "crew" secures the free end of the rope to an alder or large rock. Then the boat backs away, and at the point where the line is stretched out at right angles to the shore, the rock weight is dropped overboard.

After four lines are set at four different eddys, a place to tie up for the night is chosen and the boat made secure by two wire lines.

By this time it is dark and raining. The all-important matter of supper is the next order of business. The party of nine including captain and "crew" gathers in the cabin and there's considerable activity. Everyone attempts to help the "crew" in preparing the meal, but in most cases it is mostly moral support implemented by a can-opener. The cabin is rather crowded and there is no space at all for the fastidious. The rain increases and is really coming down now, beating on the metal roof which proves to be less than water tight. At long last things are ready and everyone becomes wholly occupied. It's self-service and plenty of food. What more could you ask if you're hungry - and you are.

Anti-climax - dishwashing - some members very busy - like the guy with the group in the restaurant who is check blind; but others haven't equal courage and start in. Light is a bit dim in the cabin, and perhaps some phases of the cleansing operation are a bit "sketchy" according to "white kitchen" standards. Dishes are finally stowed away.

Now beds are laid out on the floor of the cabin and there's very little extra space. It's still pouring outside and you try to get your bed down to avoid the drips from the deck. Such attempts are never entirely successful, but maybe you'll get out of the way of the drop aimed at your eye.

Now everybody quiets down - a few facetious remarks, then intervals of silence - finally all silence - no, not exactly; the "crew" snores. Then crash - something explodes out there on the river. You and the rest sit bolt upright in bed, wide awake. Then somebody says "water spout." This isn't altogether enlightening to you, but seems to be an explanation satisfactory to the others so you lie down again. Then you find out that this means a rock slide in the walls of the canyon caused by excessive rains. Since the "Idaho" is tied up at a terrace you know that "water spouts" can't reach you and you quiet down again. Seems as if sleep has just taken over when, klang! Must be the telephone you think stupidly and then you get a glimmer of intelligence and realize it's an alarm clock - somebody says "three thirty - time to get up" - you mention something about the Inquisition; others groan also. But there's nothing you can do about it. Just about time to get up and eat breakfast so that McGrady can start at daylight.

Everybody gets busy - a little more organization this morning. Beds are rolled up. The "crew" has the coffee already well along; somebody gets some potatoes to frying while the "crew" is hovering over some bacon. A vitamin-minded member passes canned fruit juices around. You don't need it for an appetizer but you don't pass up anything in the food line even if it is only 4 A.M.

McGrady and the "crew" eat with facility, even hurriedly, and immediately cast off. It's daylight now and ten miles more of current to fight in order to reach Johnson's Bar and the end of the line so no time to lose.

Anti-climax again. You can't seem to walk away and leave those dishes, so you sigh and grab a "tattletale gray" dish cloth. Lucky you are not handling breakable dishes for the "Idaho" in motion gives an insecure footing. You go through various contortions in trying to maintain balance and dry dishes at the same time.

Out on deck again to see what the canyon has to offer in the way of scenery. It's about the same. There are the same steep walls, a few terraces, the same current with occasional rapids all the way up to Johnson's Bar. The river is noticeably higher, but the "Idaho" has no particular difficulty.

Johnson's Bar is reached - end of the line - nothing there but a mail box on a terrace. Nobody to meet the boat. A few minutes for delivery of mail and then the start of the return trip.

It's something of a relief to be going down stream. There is a pleasurable thrill in running the rapids; also you feel that now, with little strain on the engines, there is small likelihood of any accident to machinery. Going down through the rapids, however, requires fully as much skill, if not as much power, as going up. McGrady's technique inspires confidence even though at times the "Idaho" keels over so that you will get your feet wet if you are standing on the cat walk.

Now for the sturgeon lines. McGrady noses into the bank where the last line was set the previous night. The "crew" disengages the line and gets on board. The "Idaho" floats away from the shore and the "crew" pulls in the line. Because the sturgeon is a bit on the sluggish side and because of the heavy rock weight, you can't be sure whether or not the "crew" has a fish until either you see said fish in the water or the "crew" pulls the rock weight into view. In this case, a fish about 3 feet long comes into view and is hauled aboard without difficulty. The fish flops about some, but nothing compared to a real active fish like a salmon. The "crew" runs a rope through the sturgeon's gills and places him in the eel box which is much too small for him. One of the other three lines yields a sturgeon - smaller than the first - and that's all for sturgeon fishing.

McGrady makes a landing and takes on 3 sacks of wool. There is nobody around, and no sign of habitation. Ranches must be up in the hills somewhere. A sack of wool sounds as if it would be light and fleecy - fleecy surely, brother, but not light - 350 pounds in a sack made of heavy jute. You don't do much in the way of lifting - you just roll them aboard.

Down to Pittsburg Landing - to take on wool. Seems like a metropolis this morning. There are at least a dozen people including some youngsters; plenty of sheep, dogs, and horses.

Before loading the wool and taking on passengers, McGrady has another job to do which indicates something of the scope of his freighting service. Several men get aboard on the Oregon side and the "Idaho" goes across the river where a man with a rope on a steer is waiting. As soon as McGrady lands the boat, the men get off and promptly "bulldog" the steer, tying his head and feet so that he cannot move. Then, by means of a rope attached to his horns and by ungentle (definition: vigorous yanking east or west) steering with his tail, the unhappy steer is pulled up two planks and oriented crosswise on the deck in front of the pilot house.

Back across the river goes the "Idaho" and several sacks of wool are taken aboard as well as some passengers. Among these are two young ranch girls, fourteen or fifteen years old, who are having a wonderful time.

Four or five miles below Pittsburg Landing, the "Idaho" noses into the Oregon bank, and the Pittsburg Landing passengers get off. Some men and a pack train are waiting. This is the end of the excursion for the steer also. He is unloaded rather easily by placing him at the side of the deck with his four feet just over the side. While a man standing on shore holds the rope attached to his horns, and another man sits on the steer's head, McGrady carefully loosens the rope so that it can be removed from the steer's feet quickly. At the critical moment, McGrady takes away the ropes, the man at the head end gives a mighty shove, and the man on shore pulls on the rope. The steer convulses himself over the side of the boat and lands on all four feet in the shallow water. He scrambles on to dry land; then stands switching his tail and rolling his eyes as if to ask indignantly, "what's coming off around here?"

One of the young girls mentioned above starts saddling a horse. You remark the efficient way she cinches the saddle - no lost motion - old stuff to her - she's probably been at it ever since she was able to boost a saddle on to a horse.

Incidentally you will be struck by the fine-looking saddle horses up in the canyon. Without exception, they all seem well-shaped, spirited, and well kept - evidence that the horse is still of first importance for transportation in some sections of our country. The automobile has no place in the Snake River canyon.

A description of the balance of the trip down the river would be not without incident but in the main repetitious - running Zig Zag Rapids is highly exhilerating. The "Idaho" greans a bit with the strain in her timbers as she changes course here; one side goes down into white water; you hold your breath for a moment as she rights herself and goes plunging along.

More wool - the cabin is full; all the luggage and stuff is now stored on the deck; some sheepherders get on; they are holiday bound for Lewiston. Conversation indicates certain anticipations and you are certain that Robert Louis Stevenson was one hundred percent right. One sheepherder has a bundle of "green" sheepskins - very redolent of - well - sheep. He places them on deck next to some luggage, and thoughtfully mentions to the owner of the luggage that maybe said owner would like to move it a greater distance away from the skins. "Some people don't like the smell," he says.

Rounding a turn in the river, you view perhaps the finest scenic stretch of the river below Hells Canyon. Here the river flows westward. You look down the swiftly moving water for a mile or so. On the Idaho side are steep rock headlands to the waters edge. On the Oregon side is a small terrace backed by mountains with steep, rocky slopes and pinnacled summits. The Imnaha rushes into the Snake beyond a high bluff and high up along the skyline to the west are massive horizontal basalt flows.

Here on the terrace, Fargo Landing, the engineers get off. A tent with a fly has been set up. Smoke from a camp stove beckons. Perhaps you'll want to stay here until the "Idaho's" next down-trip. There isn't very much new to see on the way down. Besides the number of passengers aboard precludes free and unrestricted selection of desirable deck space. You are continually on the lee side of those "green" sheepskins. Yes, Fargo Landing it is - Adios, McGrady.

Too bad to stop on a sort of sour note? Not so intended. You treasure the small inconveniences as a part of the whole pleasant picture of this unique voyage. In a day you have traveled into one of the most inaccessible regions of the country - a region with all the flavor of the old West - where the few inhabitants rely with assurance for mail and transportation entirely upon weekly trips of Kyle McGrady.

****

NONFERROUS METALS

According to the E. and M. J. Metal and Mineral Markets, New York, demand for nonferrous metals continues at a high level. As predicted, the price of Prime Western zinc has advanced 1½¢ per pound to 12¢ as a result of the advance of $6.00 a ton in the price of zinc concentrate in the tri-state district. Inquiries for lead are brisk and judging from reports consumers are unable to obtain sufficient metal to cover all of their requirements. The supply available for February may be smaller than that distributed during January. Consumers are looking to imports to increase supply. According to some observers, a higher price for lead will not bring out more metal at this time. Sales of copper for January delivery are about 112,000 tons. The buying interest in February metal has been very active. The domestic market is firm at 21½¢ valley points. Quicksilver buying is reported as quiet with the price remaining at about $79 per flask for spot metal. The price of foreign silver remains steady at 74 5/8¢ per ounce. The market price of antimony packed in cases in lots of 10,000 pounds or more but less than a carload has been revised upward to cover advance in freight charges to New York. The price is now 36.12¢ per pound New York area, and remains at 33¢ per pound carload lots f.o.b. Laredo, Texas. The Aluminum Company of Canada has advanced its price of aluminum ingot 1½¢ per pound to the basis of 15¢ delivered to Canada consumers.

****

"FREE MARKET" PRICES OF GOLD

Following is a list of gold black market prices in world markets for 1946 and 1947 as given in Barron's Weekly, issue of January 12, 1948. It will be seen that according to this list declines outnumber increases.

The article accompanying the list states that the decreases and increases in the gold prices are influenced by economic conditions in the countries where the changes occurred. Decreases in Rumania and Italy were the result of devaluation of the currency; in France, Germany, Belgium, and Egypt, decreases occurred because industrial production is showing improvement. The severe strain on economic conditions in China induced by the civil war is shown in the continued rise in the gold price. The article states that the rise in Switzerland has been due to the request of the U.S. government that Switzerland stop selling gold coin freely. The action represents the continued general move of the United States and the International Monetary Fund to attempt to prohibit black markets in gold. It appears that the only places in the world where free gold transactions may be permitted are in Macao in Portugese China, Tangiers in North Africa, Beyrouth in Syria, and Caracas in Venezuela.

(dollars per ounce)

	Dec. 1947	Dec. 1946
Stockholm	41.50	36.00
Zurich	42.00	38.00
Mexico City	42.50	41.00
New York	42.75	37.00
Brussels	43.00	46.00
Buenos Aires	43.50	41.00
Toronto	44.00	45.00
Rome	46.00	51.00
Lisbon	46.50	48.00
Santiago	47.50	47.00
Manila	48.50	44.00
Beyrouth	52.00	51.00
Paris	53.00	56.00
Tangiers	53.00	57.00
Istanbul	53.00	55.00
Cairo	62.50	78.00
Bombay	71.00	71.00
Athens	73.00	85.00
Chungking	76.00	63.00
Berlin	78.00	80.00
Bucharest	81.00	84.00

****

HIGH CONSUMPTION OF PLATINUM METALS IN 1947

World demand for platinum metals was maintained at a high level in 1947, with United States consumption estimated at 375,000 ounces, including 200,000 ounces of refined platinum and about 150,000 ounces of palladium, according to Charles Engelhard, president of Baker & Co., Inc. Industrial reconstruction in Europe absorbed larger quantities of the metals in the platinum group than in the preceding year.

The jewelry industry continues as a major consumer. However, a large proportion of the available supply of platinum metals is being used for industrial purposes. The economic advantage of using platinum metals for critical parts of equipment is recognized by producers of rayon, fiber glass, electrical apparatus, and chemical equipment. The development and perfection of bimetallic products made from a base metal faced with platinum has enabled manufacturers to use the precious metal to better advantage.

Platinum alloyed with rhodium is used extensively in the production of spinnerets for the rayon industry. Excellent fabricating qualities make it possible to drill more than 15,000 holes of about two and a half thousandths of an inch in diameter in a spinneret two and a half inches in diameter. Feeder dies of platinum metals are used in the mass-production of electric light bulbs.

An increasing quantity of jewelry is being manufactured from an alloy of 95 percent palladium and 5 percent ruthenium....Jewelers have found rhodium plate increasingly popular. Rhodium has the highest reflectivity of metals comprising the platinum group, and it is being employed more extensively in the production of front-surface mirrors. (Taken from E. & M. J. Metal and Mineral Markets, January 1, 1948.)

****

ANNUAL MEETING OREGON ACADEMY OF SCIENCE

The Oregon Academy of Science held its annual meeting on January 16-17 at Willamette University, Salem. Business meetings were held on the afternoon of January 16 followed by a dinner attended by members of the council at the University commons. A public meeting was held in Waller Hall in the evening which was addressed by Dr. D. Curtis Mumford, Oregon State College, recent delegate to the International Conference of Agricultural Economists in England, on "Food and the Future."

On January 17 meetings of the various sections including biology, chemistry, mathematics, and geology and geography were held in Collins Hall. The program of the geology section, A. D. Vance, Chairman, was as follows:

(1) "Fossil Mammalian Tracks in Lake County, Oregon": E. L. Packard and I. S. Allison of Oregon State College and L. S. Cressman of the University of Oregon.

(2) "Native Vegetation in the Willamette Valley Region": John E. Smith of Corvallis.

(3) "Coastal Indians Land Case - An Historical-Geological Appraisal": Warren D. Smith of the University of Oregon.

(4) "Oregon's Rare Borate, Priceite": Lloyd W. Staples of the University of Oregon.

(5) "Occurrences of Ground Sloths in Oregon": E. L. Packard of Oregon State College.

(6) "Human Occupation of the Klamath Basin - A Preliminary Report": L. S. Cressman of the University of Oregon.

(7) Round table discussion on the subject of "Scarcity of Domestic Strategic Minerals with Special Attention to the Northwest," by Dr. Lloyd W. Staples, Professor of Geology, University of Oregon; Mr. Sheldon L. Glover, Supervisor, Division of Mines and Geology, Washington Department of Conservation; Dr. Warren D. Smith, emeritus Professor of Geology, University of Oregon; and F. W. Libbey, Director of the Oregon Department of Geology and Mineral Industries.

****

PRELIMINARY REPORT ON METAL MINING IN OREGON, 1947

The United States Bureau of Mines has released preliminary estimates on the production of gold, silver, copper and lead in Oregon during 1947. No zinc production was reported. Production of the metals was as follows: gold, 18,780 fine ounces; silver, 33,000 fine ounces; copper, 16,000 pounds; lead, 22,000 pounds. Value of the four metals in 1947 was $693,721.00 compared with $624,231.00 in 1946.

Gold output in 1947 increased 7 percent compared to 1946 but is far below production of 113,402 ounces valued at $3,969,070 in 1940. Placers furnished the bulk of the production with the largest amount from two connected bucket dredges in Eastern Oregon, the Sumpter Valley Dredging Company and the Porter and Company dredge. Production of silver in 1947 increased from 6,927 ounces valued at $5,597 in 1946 to 33,000 ounces valued at $29,865 in 1947. The principal silver producer as in previous years was the Oregon King mine in Jefferson County. The silver was recovered from smelting ore.

****

The ORE.-BIN
State of Oregon
DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES
702 Woodlark Bldg., Portland 5, Oregon
POSTMASTER: Return Postage Guaranteed