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OREGON'S GOLD PLACERS

by

The Staff

Because of many inquiries received by the Department asking for information on areas in Oregon where placer gold may be found, the staff has prepared the accompanying article. A large proportion of these inquiries are from people who have had little or no experience in mining but who wish to learn, and at the same time get some recreation. In an article of this kind only the barest outline of placer mining technique can be given. The Department does not have detailed information on which any recommendations concerning the location of profitable placers may be made.

The Editor

History

The discovery of gold in the rich placers of the Sacramento Valley of California in 1848 profoundly affected the course of events in western United States. The first direct effect was the rapid spread of gold prospecting into Oregon, Washington, Idaho, Montana, and British Columbia.

Gold was found in the sands of the Rogue River in 1849 by men on their way to California gold fields; but the discovery was overshadowed by the excitement in California and, too, the low concentration of the Rogue River gold, where first found, was probably somewhat discouraging.

In 1851 prospectors from California came into Oregon and discovered rich placers on Jackson Creek. This discovery resulted in the founding of Jacksonville and was the beginning of the mining industry of the State. Reports of the rich Jackson Creek placers brought in a large number of prospectors from California. In fairly rapid succession gold discoveries were made on many of the tributaries of the Rogue River, notably the upper Illinois and the Applegate. Soon thereafter, in 1853, gold was found in fairly heavy concentrations on the beaches near Bandon and at Gold Beach.

There is no record of production for the first ten years of mining in the State, nearly all of which was in southwestern Oregon.* The value undoubtedly amounted to many millions of dollars, probably fifty millions or more.

* According to articles and news items in the Oregonian during the early 1850's, prospecting at that time was being done with some success on the Malheur, John Day, and Burnt rivers, but trouble with Indians and the richer discoveries in Washington and Idaho held Oregon prospecting back until the rich discoveries were made at Griffin Gulch near Baker.

In 1861 rich gold concentrations were found in Griffin Gulch, west of the present city of Baker. A rush occurred and the productive areas spread out to Auburn, Canyon City, upper Powder River, upper Burnt River, and to some of the high bars or terraces above Willow Creek.

As in all gold placer mining areas, activities in Oregon began with mining of the easily accessible placers by hand methods. These were followed by large-scale methods, at first using hydraulic giants and later, where conditions allowed, dredges. Application of the dragline dredge was something of an innovation and grew out of developments in seeking cheap methods of earth moving.

When the United States Government advanced the price of gold in the early 1930's, there was a great increase in gold mining activities throughout the West. In Oregon this increase was mainly noticeable because of a large number of dragline dredges which came into the State. The principal areas affected were the Sumpter Valley area in western Baker County, the John Day Valley, the North Fork and Middle Fork of the John Day in Grant County, and tributaries of the Rogue River in Josephine and Jackson counties. The high point in production came in 1940 when a total of 56 dredges, including dry land equipment, worked in the State. In addition there were 82 hydraulic mines, 10 drift mines, and 44 hand-operated properties, making a total of 192 producing placers. Gold production from placers during 1940 amounted to 71,577 ounces, valued at $2,505,000.

The death-blow to gold mining came in 1942 when, in October, War Production Board Order L-208 was put into effect. Gold mines were shut down without recourse and remained closed until July 1, 1945, when L-208 was somewhat tardily rescinded. Since that time a few dredges and hydraulic operators have resumed work - a very bare skeleton of the pre-war industry. In early June 1948 there were 5 producing dredges, and during the season when water was available there were 16 hydraulic operations. A small number of "snipers" have worked sporadically during the year. High costs of exploration and operation, together with the fixed price of gold, are effective in throttling gold mining, both lode and placer.

Placer activities

Dredging: During 1941 a total of 49 dredges of all types operated in the northeastern and southwestern parts of the State. As this is written (June 1948) 5 dredges are working in northeastern Oregon and 2 are preparing to work in southwestern Oregon. These are located respectively in Sumpter Valley, South Fork of Burnt River, and Cottonwood Creek, Baker County; Clear Creek and the North Fork of the John Day River, Grant County; and upper Illinois River, Josephine County.

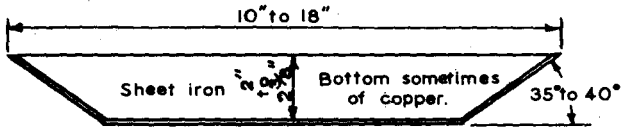
Hydraulic mining: Hydraulic mining activities are centered principally in southwestern Oregon. Hydraulicking is used on gravel banks which are so situated that gravels may be broken up by water under pressure from nozzles, washed down, and carried beyond the pit, usually through sluices. The method is cheap but, of course, water under a high head is required. The efficiency of a hydraulic operation depends upon the amount and head of the water available and ease of tailings disposal.

Ground sluicing is a method of excavating placer gravels by flowing water, and, when plenty of water is available, it is a cheap method of washing gravel away leaving the gold behind. Various adaptations may be used depending upon the conditions of gravel bank and amount and fall of water. Essentially, in ground sluicing a stream "is diverted to flow against or over a bank of placer ground, eroding it and washing it to and through box sluices."*

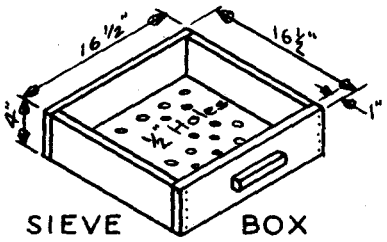
Placer areas

The accompanying maps of northeastern and southwestern Oregon show the generalized locations of known placer deposits. Many of these areas which have been dredged would offer little likelihood of finding commercial gravels. However, some potential gold placer areas have not been worked, and many of the hydraulic operations contain fairly good reserves.

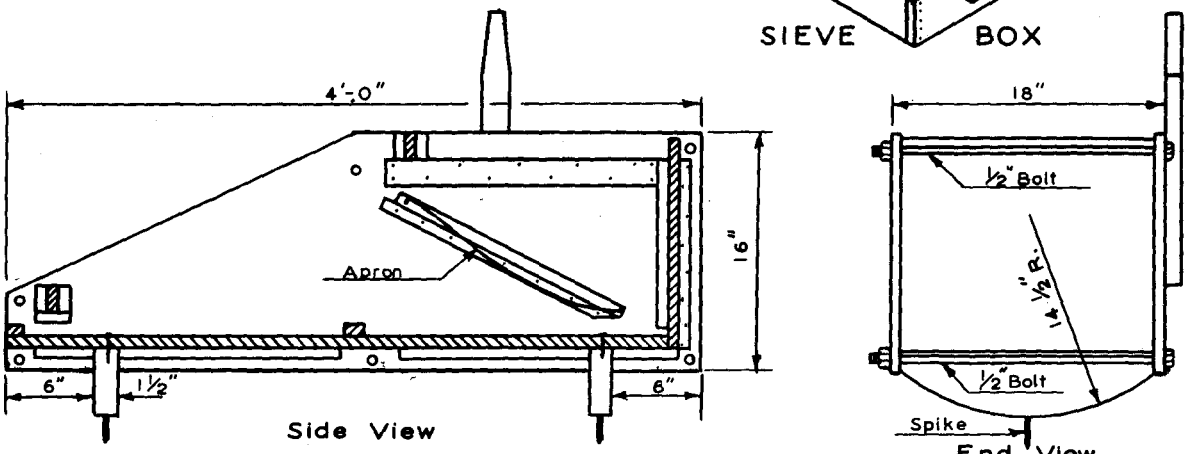
*U.S. Bur. Mines Inf. Circ. 6611R, 1938, Small-scale placer mining methods, by C.F.Jackson.



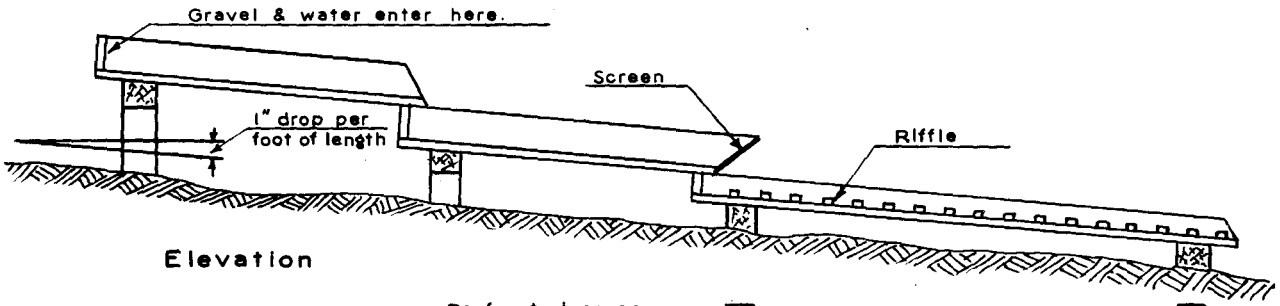
GOLD PAN

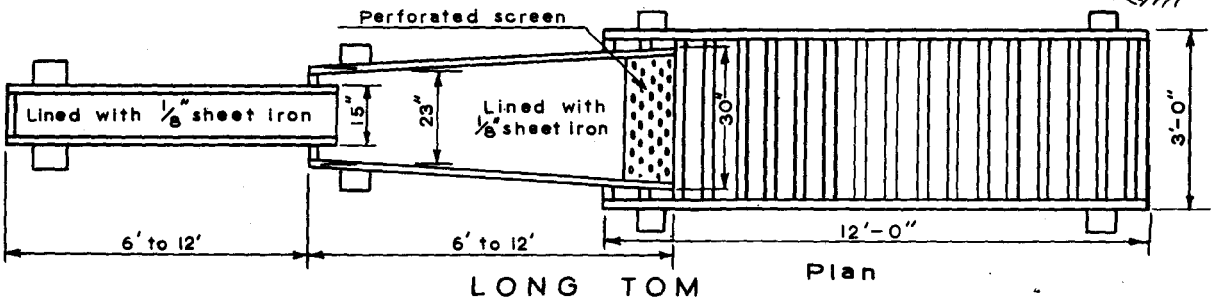


SIEVE BOX

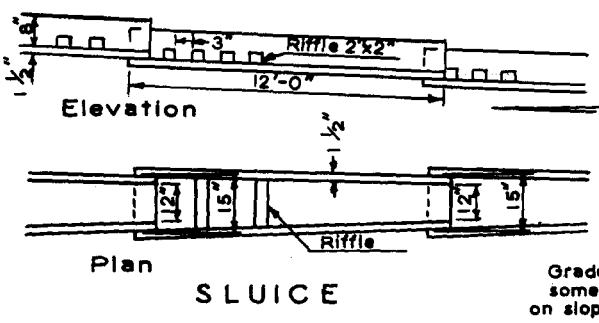


KNOCKDOWN ROCKER

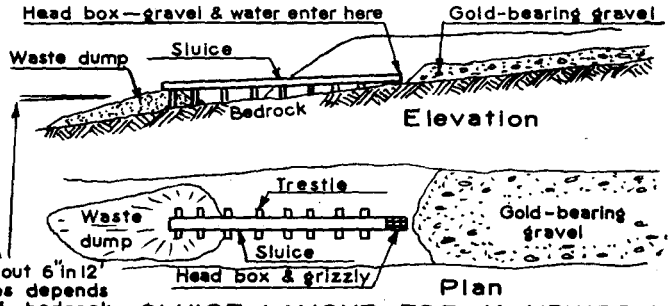




LONG TOM



SLUICE



Grade about 6"in12' sometimes depends on slope of bedrock.

SLUICE LAYOUT FOR HANDWORK

SMALL SCALE PLACER MINING APPARATUS
(Taken from U.S.B.M. I.C. 6611R)

D. I. B.

Since these operations are limited, both by water supply and by regulations of the Rogue River Coordination Board, the reserves will last for a long time. There is, too, the probability that at some time in the not too distant future the price of gold will be raised substantially. This will increase the reserves of the hydraulic gravels as well as bring into the commercial picture some low-grade gravels which may be worth dredging.

It should be emphasized that no placer areas have been tested by the Department and no recommendations can be made.

Beach placers

Beach placers may be considered under two headings - present beaches and ancient, elevated, marine terraces. The high-grade gold concentrations on the beaches in the early days appear to have been all worked out, but small-scale methods are still employed in certain places even though the returns are meager. The present beaches have, so far, not lent themselves to large-scale operations. In many places the beaches contain an excessive quantity of buried logs and stumps, and it should be noted that the accumulations of sand on the present beaches are of a transitory nature. These sands may pile up in certain periods of storms and high tides; they may be depleted during other periods. Probably there are large gross values in some of the offshore accumulations. Whether or not it would be feasible to treat successfully these nearshore, underwater deposits is debatable. It should be mentioned that the gold found on the beaches is usually finely divided and its association with heavy black sand makes for poor recoveries; this condition has caused many failures of beach placer projects in the past.

The ancient, elevated, marine terraces have been explored from Coos Bay south to and beyond the California line. There have been numerous attempts to mine these deposits but it is doubtful if any of them have been profitable. Usually the overburden is heavy and, in addition, the high proportion of black sand with which the gold occurs has always hampered gold recovery. These terrace deposits were investigated rather thoroughly during World War II because of the occurrence of chromite in the sands.

River-terrace placers

Some of the high bars or perched river-terraces in eastern and southwestern Oregon appear to offer interesting possibilities for gold placer mining, provided that operators are experienced. Such operations will need to have water brought to them, or, in some places, it may be feasible to screen the gravel and haul the fines to water. Such projects should receive thorough investigation before money is spent on a plant.

It may be mentioned also that platinum metals occur with the gold in some places on the southern Oregon coast as well as in inland placers. Under present prices for platinum such occurrences would materially influence the gross values in the sands and gravels.

Summary

The attraction of gold hunting and gold finding will never diminish as long as there are prospectors or persons with the prospector's urge. However, without systematic exploration there is no hope of a real gold-mining industry, and under present economic conditions there is no incentive to carry on gold mining exploration, either lode or placer.

Oregon's placer mining industry is nearly 100 years old and has been worth to the State upwards of $100,000,000 in value of production. That as much or greater gold value remains in Oregon's placer gravels can hardly be doubted, but how much of the remaining gold may be won at a profit is highly problematical.

There are a few gold-bearing alluvials which are overlain by good cropland; there are other areas which are privately owned by people who know very little about, and are not interested in, placer mining; still other gold bearing gravels might have physical conditions such as large boulders or too much clay or too much overburden all or any of which might

prevent profitable operation. It is probably needless to state that no project involving capital expenditure should be undertaken without thorough investigation.

For the new small-scale operator, the prospector, "sniper," "pocket" hunter, or amateur gold hunter the placer areas available would be generally included in the following classifications:

1. Unreserved and "open" public domain. Such areas may be located under the placer mining laws. No single agency would be able to give complete information on areas which may be "open." Anyone seeking an area which may be located should first find out from the nearest district U. S. Land Office the extent and location of the unreserved public land. In order to find out if a particular section of this land is open for location, he should search on the ground and in the county recorder's office for evidence of prior location or abandonment. He should of course familiarize himself with Federal and State mining laws covering location and assessment work.*
2. State land. The State Land Board has control of such land. The location and extent may be determined from Land Board records at Salem or from the records of the County Assessor. A mining lease may be negotiated with the Land Board.
3. Privately owned land. In order to prospect or work such land it is necessary to make arrangements with the owner of the land.

*Mining laws of the State of Oregon: Oregon Dept. Geology and Min. Industries Bull.1, 1942.

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ASSESSMENT WORK

Senate bill 2479 which exempts mining claims from annual assessment work for the current assessment year ending July 1, 1948, has passed the House according to a telegram from Senator Guy Cordon to the State Department of Geology and Mineral Industries. The bill had previously passed the Senate, and the House action therefore clears the way for the President's signature.

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MICROFOSSIL REPORT PUBLISHED

The first volume of Bulletin 36 describing microfossils of certain geological formations of western Oregon has just been issued by the State Department of Geology and Mineral Industries. This illustrated report, prepared in cooperation with the U.S. Geological Survey, gives results of the first studies of a project undertaken by the Department designed to determine the proper place in the geologic column of sedimentary formations of the State. Such studies are of particular value to oil geologists and also are needed in order to construct a geologic map of the State. Title of the report is "Five Papers on Foraminifera from the Tertiary of Western Oregon." Authors are J. A. Cushman of the U.S. Geological Survey, R. E. Stewart of the Department staff, and K. C. Stewart.

Bulletin 36 may be obtained from the Department office in the Woodlark Building, Portland, or the field offices at Baker and Grants Pass. Price postpaid $1.00.

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SAFETY PAMPHLET

A pamphlet designed to show the dangers, particularly to children of school age, of exploring old mines or other underground openings is being distributed free by the State Department of Geology and Mineral Industries. The pamphlet is illustrated by John Powers of the Safety Department of the Anaconda Copper Mining Company. The text was supplied through the cooperation of the Safety Division of the U.S. Bureau of Mines and the Arizona Small Mine Operators Association. The pamphlet illustrates graphically many hazards which are peculiar to old underground openings, and warns against their exploration by persons inexperienced in underground work.

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NEW OREGON MINERAL

Mansfieldite, a hydrous aluminum arsenate, discovered at Hobart Butte, Lane County, Oregon, is a new mineral described in the American Mineralogist, March-April 1948, by Victor T. Allen and Joseph J. Fahey. The first specimen of the new mineral was collected July 29, 1942, by Dr. Victor Allen who, with Dr. Robert Nichols, was investigating the high alumina clay deposit at Hobart Butte for the U.S. Geological Survey. The mineral was named for the late Dr. George R. Mansfield, former Chief of the Section of Areal and Nonmetalliferous Geology, U.S. Geological Survey.

The discovery of mansfieldite has added a new member to the family of rare natural aluminum arsenates and has permitted the discoverer to clarify relations among members in the series of minerals ranging from aluminum arsenate to iron arsenate (scorodite).

Mansfieldite is white to pale gray and occurs in porous, cellular masses of spherulitic fibres along with a pale green mineral of like texture generally called scorodite. The latter mineral, according to Dr. Allen, has not been found free of alumina at Hobart Butte, and is properly called aluminian scorodite.

The article by Messrs. Allen and Fahey sketches the geology of Hobart Butte and briefly describes mineral assemblages besides the aluminian arsenates.

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CLEARING HOUSE

CH-102 - For sale: Grinding plant consisting of hammer mill, feeder, grinder, cyclone, screen, ice plant located at Terminal No. 4 with trackage at Portland. Anyone interested should get in touch with the owner, P. E. Harris. Telephone ATwater 1821.

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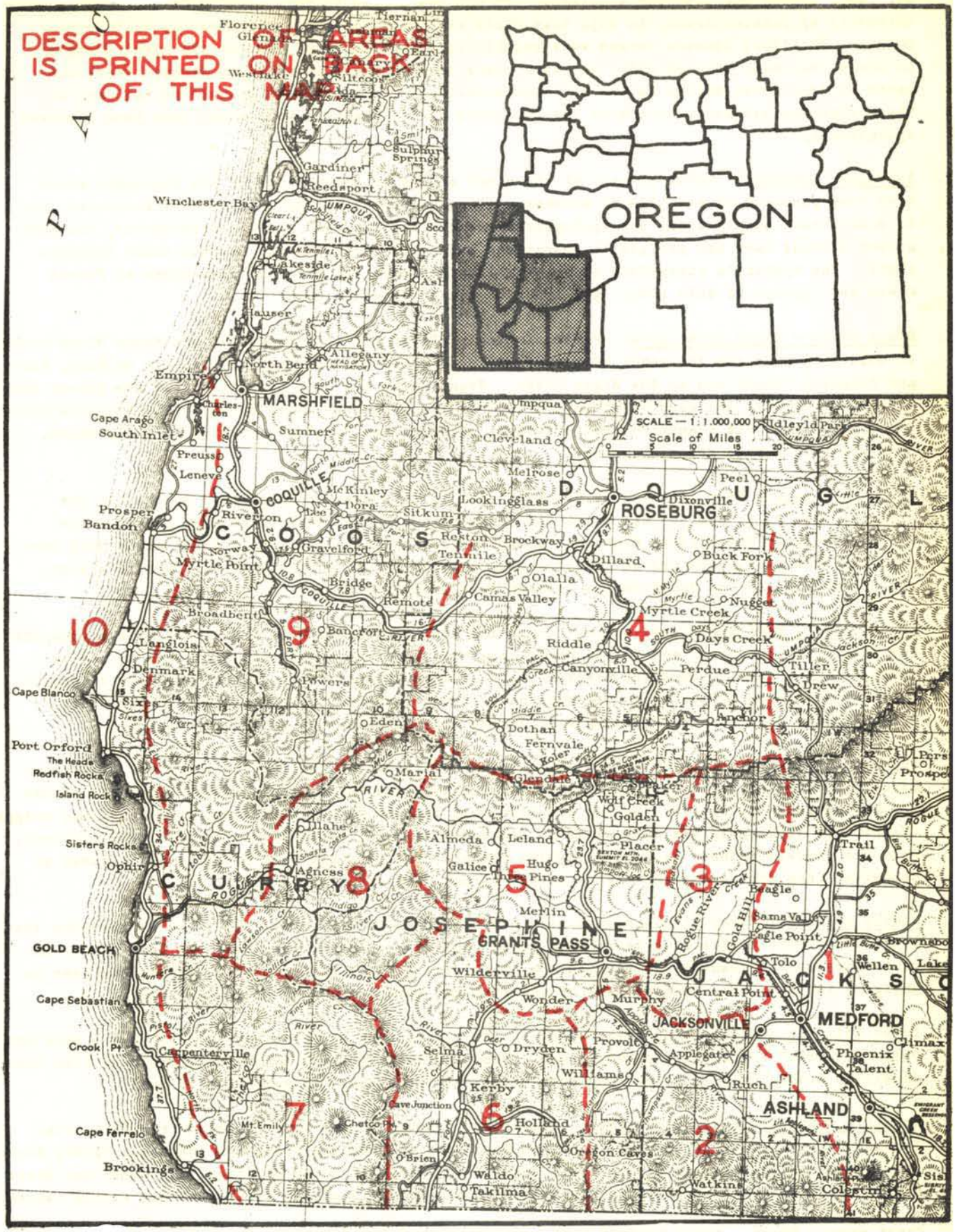


PLACER MINING AREAS OF SOUTHWESTERN OREGON

(Numbers refer to areas on opposite side)

1. Jacksonville - Talent area: Placer mining here has been limited to Bear Creek and its tributaries draining the Siskiyou Mountains. It was the strike in this area on Rich Gulch, a tributary of Jackson Creek, in 1851 that first attracted the many propectors to southwestern Oregon. The first placers worked were usually of the gulch type. One of the first dredges in Oregon was near Tolo in 1898; in later years small dredges operated on Jackson Creek and parts of Bear Creek Valley in and near Jacksonville. The auriferous gravels at the base of the Cretaceous sediments, found in the foothills of the Siskiyou Mountains, have been placered sporadically.

2. Applegate drainage: Parts of many of the minor and major tributaries of the Applegate River have been placered at one time or another. All main placer mining methods have been used, and in some areas, mainly along the Applegate River and Forest Creek and its tributaries, the more modern methods have had profitable operations after older methods had reached their economic limit. The hydraulic operations of the Sterling Mine and the dredging operations on Forest Creek are typical of this area. All types of placer deposits occur.

3. Evans Creek - Rogue River area: Parts of nearly all of the tributaries of the Rogue River south of Gold Hill have run the gamut of placer mining operations. Dredges have worked on Kane, Foots, and Pleasant creeks and in the Rogue River. Evans Creek has long provided sites for placer operations but most of the work has been confined to the area from Sykes Creek to its junction with the Rogue. The "old channels" west of Wimer, although the scene of activity in early times, have not been worked for many years.

4. Umpqua drainage: Very little work has been done in this area in comparison to that in the areas of Nos. 2, 3, and 5. Cow Creek and "high channels" adjacent to it have received the most attention. The Victory Mine near Glendale is a typical operation. Other areas that have reported some production are on Olalla Creek, tributaries of Myrtle and North Myrtle creeks, and tributaries of the South Umpqua between Days Creek and Tiller.

5. Grants Pass - Wolf Creek area: Grave Creek and its tributaries Wolf and Coyote creeks, Jumpoff Joe Creek, Taylor Creek, and Galice Creek have been the most consistent producers in recent years. At one time or another, however, work of some type has been done on portions of practically every stream in the area. Dredges have worked on Grave Creek and in the Rogue River. "Old channel" deposits are found in many places and are scenes of periodic activity.

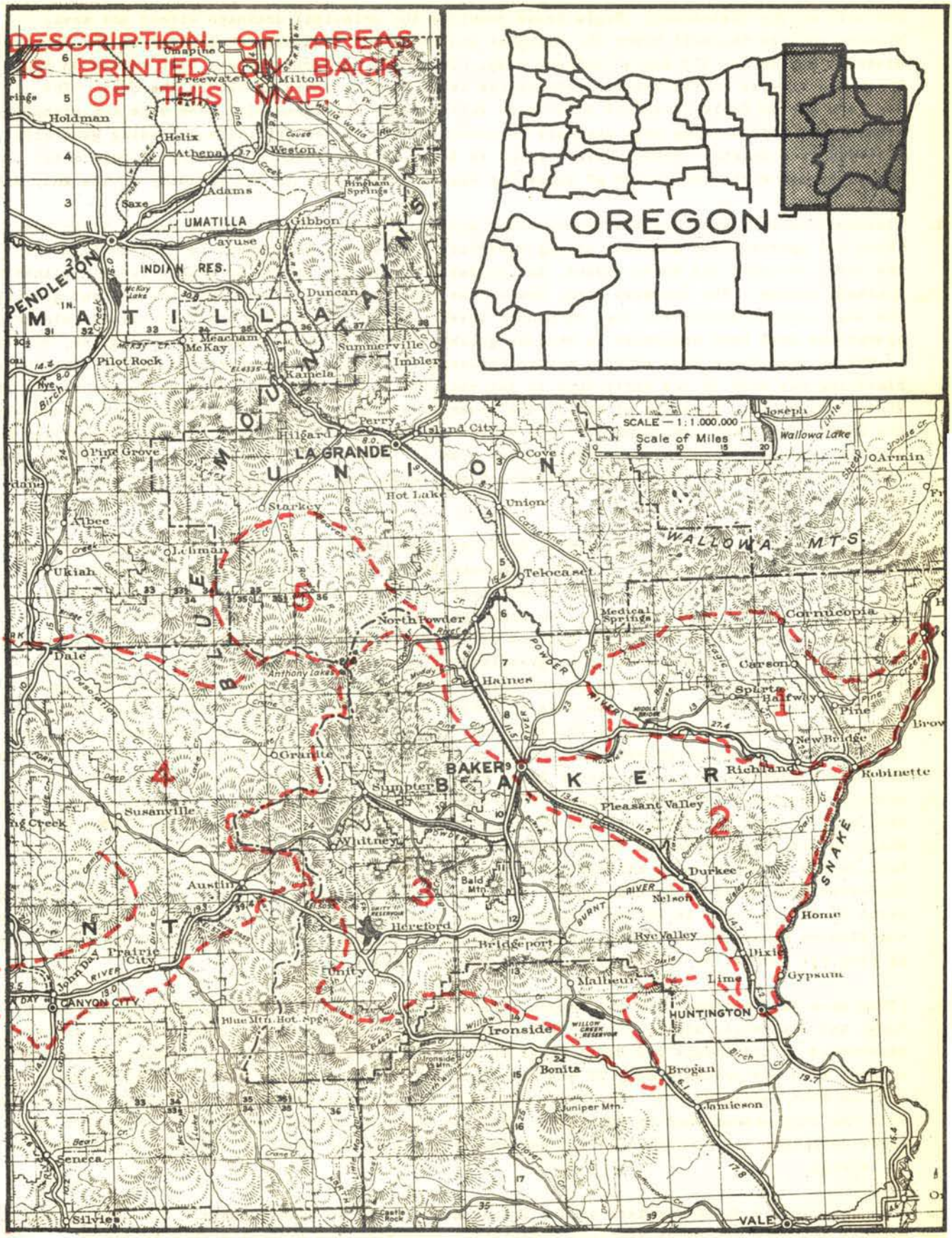
6. Upper Illinois area: The Esterly mine in this area is one of the famous old mines of Oregon. Here gold and platinum are found in both the Tertiary and Quaternary gravels, with most of the production from the latter. Mining has also been done on Sucker, Althouse, Josephine, and Briggs creeks ever since gold was discovered in Jacksonville. All types of mining have been utilized, from the crudest methods to large dragline dredges, and gold has been found in all classes of deposits, from Cretaceous gravels to Recent stream channels.

7. Chetco drainage: Very little recent work has been done in this area. It is quite possible that its inaccessibility has much to do with this. The work that has been done has been mainly in Quaternary stream channels or high on the hillsides, such as in Gold Basin. There has been no dredging in this area, in fact most of the work has been limited to ground sluicing.

8. Lower Illinois - Rogue River area: Most of the mining here has been confined to gravel bars and "high channels" bordering the two rivers. Some hydraulicking and ground sluicing have been done on Silver Creek, Collier Creek, and Mule Creek but the operations were usually small.

9. Coquille - Sixes - Lower Rogue area: Only minor production has been reported from this area. Streams on which most of the past work has been done are Boulder Creek and the Rogue River; Rock, Johnson, and Salmon creeks of the South Fork of the Coquille River drainage; Elk River and Sixes River. Work has been confined to hydraulicking and ground sluicing in present-day stream channels.

10. Coast area: Beach placers include both present beaches and elevated marine terraces. Rich sands were found at Gold Beach and at Bandon in 1852 and beaches have been prospected and worked for gold and platinum as far north as Cape Arago. In former years, several operations on the elevated terraces were attempted, including the Eagle and Pioneer mines, north of Bandon and the Madden mine, north of Sixes. Gold and platinum occur as flakes in black sand and vary greatly in distribution and quantity.



PLACER MINING AREAS IN NORTHEASTERN OREGON

(Numbers refer to areas on opposite side)

1. (Covered by this area are the Cornucopia, Eagle Creek, Homestead and parts of the Sparta-Sheep Mountain mining districts.) Eagle Creek provides the principal drainage within the area. Placers include the well known old Shanghai and other old time placer diggings in the Sparta district and in the old Hogem (Sanger) camp. Gulch and bar gravels have been worked on Eagle Creek and on some of its smaller tributaries as well as on other creeks in the area. The New York Bar on Eagle Creek and Pine Creek Valley below the Cornucopia lode mine are examples. Remnants of gold-bearing high channels reportedly exist in the dry hills extending generally eastward from Sparta. Powder River, which is taken as the southern boundary of this area, has supported a limited amount of placering almost exclusively in the vicinity of the Macy Mine.

2. (Included in this area are the Conner Creek and Virtue and portions of the Baker, Lower Burnt River and Sparta-Sheep Mountain mining districts.) The area is bounded for the most part by the Burnt, Powder, and Snake rivers, but contains within its bounds no single large distinctive drainage system. For the most part, the creeks that do exist radiate from the Lookout Mountains. The most notable placer was that on Conner Creek. Fairly extensive, but less notable placering operations have been conducted in various gulches on Little Lookout Mountain. Smaller, widely scattered operations have existed around Pleasant Valley and as far north as Virtue Flat where placering was done in the early days in the vicinity of the surface exposures of the Virtue and White Swan veins. A series of bars, both river level and elevated exist at various places along the Snake River, and have long been the object of attention by "snipers." The Powder River has already been mentioned in the discussion of area 1. Burnt River, which from Durkee to Huntington is taken as the southwestern boundary of this area, has never proved of much interest to placer operators.

3. Two major drainages and several mining districts are included in this area. (The mining districts are the Cracker Creek, Greenhorn, Morman Basin, Rich Creek, Sumpter, Upper Burnt River and portions of the Baker and Lower Burnt River districts.) The drainages are the Powder and Burnt rivers. The headwaters of these drainages, around Whitney and the Sumpter Valley, are characterized by rather extensive placers of the valley-fill type. Gold values are found on down both of these rivers, but in progressively decreasing quantity with locally valuable concentrations dependent largely on contributions from tributary streams. Many such streams are tributary to both rivers. In the case of Powder River, the celebrated Auburn placer is an example. Similar gulches draining the mountains on the north side of the river have been found to contain gold-bearing gravels from Baker to Sumpter. This does not appear to be the case in the creeks draining in to the Powder River from the south. The placer on Stices Gulch is a notable exception. As in the case of the Powder River, only limited and sporadic attempts have been made to work the lower reaches of Burnt River. Tributary streams such as Clarks Creek, which drains from the Morman Basin district and Pine and Cow creeks which drain to the south from Dooley Mountain, have all sustained productive operations. Other placers, not directly connected with these major drainages, occur in Morman Basin and Rye Valley, and on the drainage basin of Willow Creek in Malheur County. Also, various creeks draining in to Baker Valley from the Elkhorn Mountains have been worked. Throughout the area small-scale operations of a seasonal kind are carried on regularly by utilizing snow waters.

4. (This area embraces parts of the Canyon, Granite, Greenhorn, Middle Fork, North Fork, Quartzburg, and Susanville mining districts.) Included in the area are the John Day River and the headwaters of the Middle and North Forks of the John Day with all their tributary streams. The placers here are predominantly of the river and gulch type although some Tertiary placer exists, such as that represented by the French diggings. No western boundary can be given to this area with the information that is available. Gold is known to extend considerable distances down these drainages to the westward, but evidence concerning the limit of economic concentrations is lacking.

5. This area covers the headwaters of the Grande Ronde River in Union County. The Camp Carson placers probably represent Tertiary deposition; otherwise the placers worked in the past have been predominantly of the gulch type of Recent age.

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PROSPECTING WITH A GOLD PAN

by

A. O. Bartell*

Do you know that valuable clues to the geology and mineralization of a district can be found in a handful of sand from a stream bed draining the area? This handful of sand has a story to tell to those who have a little patience.

A story to tell

The handful of sand may contain tiny specks of valuable minerals (gold, scheelite, cinnabar, chromite, tourmaline - to mention a few), that will lure you upstream with the hope of uncovering a new deposit. More practically, this handful of sand can indicate the type of rocks that are exposed by the drainage system. Any mineral that has a specific gravity of 3.5 or higher can be separated from soil by panning. Garnet and pyrite, for example, (some tiny but perfect textbook-picture crystals may be seen with your hand lens) can indicate an outcrop of metamorphic rocks. In one district where the writer prospected, small boat-shaped orthorhombic crystals of topaz always indicated the presence of andesite outcrops.

How do you read the story the handful of sand has to tell? By panning - yes, by panning, just as the old-time prospector does. The old prospector will tell you sagely that it takes years of experience and a good "wrist" to pan. Don't let him kid you! You don't have to be an expert to read the story in the handful of sand. Panning is a simple process of shaking the heavy particles to the bottom of the pan and washing the lighter particles off the top. It is that simple! The separation achieved by panning is the result of two processes - sizing and gravity concentration. You can put some dry sand and gravel in a fruit jar, gently shake it back and forth, and in a short while you will see that the mixture has sorted itself with the fine sand on the bottom and the coarse gravel on top - you have sized it. Now if you scrape off the gravel, take the sand alone and continue the gentle shaking, you gradually settle the heavy grains (magnetite, etc.) to the bottom of the jar and the lighter grains (quartz, feldspar, etc.) will be displaced and rise to the top - you have concentrated the heavy minerals. Water speeds up the operations by acting as a lubricant and as a medium that makes a greater relative difference in the specific gravity of the various minerals.

The recipe for panning

Fill your pan with the material to be examined. Submerge it in water and knead it with your fingers to break up the lumps of clay. Now agitate the pan (still under water) in a brisk back-and-forth-rotary motion to cause the coarser gravel to rise to the top where you rake it off with your fingers. Size it in this manner several times. Now, more gently, agitate the pan in the water with the same rotary motion but tilt it forward to cause the heavy minerals on the bottom to concentrate in the sharp bend made by the side and the bottom. Next, with the pan tilted forward and with the lip just below the surface of the water, dip the pan in a forward-upward-and-back motion so that the water washes off the lighter upper layer of sand. You can assist this operation by sweeping off the top sand with the back of your fingers. Alternate the rotary agitation with the washing action until only the heavier minerals remain. In the final washing, use your thumb to scrape away the lighter sands that wash away from the heavy minerals. Put in a small amount of clear water and give your pan a light, quick swirl to cause the concentrates to "tail" out so that you can examine them easily with your hand lens. It does take practice and skill to be able to pan quickly and accurately, but proper interpretation of the results is more important than expert manipulation of the pan itself.

Where to pan

The first and most important step in prospecting with a pan is to select a good sample. In panning streams, one must remember that Nature is roughly sizing and concentrating the rocks and sands that she has eroded from the hills. In fast water the sands will be swept along and, if they do not drop in the little eddies behind the boulders, they will be carried downstream to rest as a bar where the water is quiet. The heavy sands - the ones you are

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interested in - will drop first. They will be ones that are more likely to be caught behind the boulders and the ones that will be found at the upstream end of the bars along with the pebbles. In the summer when the streams are dry, it is very easy to select your sample, but when the stream is running bank-full, about all you can do is dig out the sands between the boulders along the bank. The heavy mineral sands tend to work towards bedrock in the stream. However, where the stream exposes patches of relatively smooth bedrock, don't expect to find rich pannings in the potholes and bedrock crevices. During high water, when there is the greatest movement and sorting of material, the bottom velocity of the stream will be greater on bedrock where there is no boulder-covered floor to impede its flow; the cobbles will be churning round and round in the potholes; there will be no chance for the sands to come to rest. An exception would be a pothole that had become "dead" by being choked with boulders - in this case the sands between the boulders should give an excellent sample.

In panning the dry washes in an arid country, it is a simple matter to get a good sample if you remember that desert gullies are usually formed under cloudburst conditions. Right after the worst of the storm, when the gullies are running bank-full, the boulders and cobbles will be moving. As the main force of the water passes, the boulders will become quiet and serve to catch the coarse sands and pebbles. When the rush of flood subsides, the silt will drop out. To select a good sample, you must dig down below this silt and fill your pan with the sands lodged between the boulders in the center of the wash.

Other places to select a sample for panning are: Iron-stained outcrops, clay-gouge areas in regions where there has been considerable faulting or magmatic intrusions, and old mining dumps. In samples panned from mining dumps, you can find valuable clues as to the character of the mineralization in the district. Also, there may be minor minerals in tailing piles that were of no value to the old operation but which, due to new techniques or uses developed, may now have sufficient value to make reworking of the dump profitable.

Prospecting tools

The common miner's pan (the one you see in the pictures of the grizzled prospector and his burro) is approximately 2½ inches deep, has flaring sides, and varies from 10 to 16 inches in the largest diameter. A 10-inch tin frying pan with the handle cut off makes a quite serviceable pan. Desert prospectors cut the handle off a "one-egg" frying pan and do their panning in a kettle of water. The panning rejects are scooped out and discarded as they collect in the bottom of the kettle, but the same water is used over and over. In this manner a two-gallon can of water and a kettle can be made to serve a whole day's prospecting.

It might be noted here that dirty water does not hinder the panning. As a matter of fact, the suspended sludge increases the specific gravity of the water, resulting in a greater relative difference in the specific gravity of the minerals.

Besides a pan, you should carry a prospecting pick and a trowel for digging the samples, several sample sacks, and a large-diameter inexpensive hand lens. The writer found that a simple 1½-inch length of 2-inch pipe made a very useful mortar for crushing rock specimens so they could be examined by panning. The piece of pipe is placed on a flat boulder, the sample dropped in and crushed with the prospecting pick.

In conclusion, prospecting with a pan is one of the fastest ways of checking the mineralization of a district. The mechanics of the actual panning are very simple, but care must be exercised in selecting the sample and interpreting the results.

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