

PROSPECTING HINTS FOR THE NEW MAN.

Get a mate with experience and spend some time with experienced men, and profit by what you see and hear (though there is no necessity to believe *all* you hear).

It is waste of time and money to start off scratch by yourself. You cannot expect, in a few days, to acquire knowledge that has taken other men years to acquire.

When proposing to operate in a district, assuming it is a centre where mining has been previously carried on, a prospector should first acquaint himself with the characteristics of the local ore bodies, whether there are certain minerals usually associated with gold, or whether the payable deposits are to be found in the form of contacts, shoots with a sharp downward trend, flat lenses, and so on. In most cases this can be readily learned by consultation with prospectors who have a practical knowledge of the district.

Kookynie district might be taken as a striking example. In and around Kookynie proper, for a radius of a couple of miles, the minerals most looked for in association with gold are oxide of iron and iron pyrites. About five miles to the north, in what is known as the Britannia line, galena is the indicator of values, while four miles south, at Niagara, bismuth is usually associated with payable ore and oxide of iron, and iron pyrites seldom indicate values. The nearest mining camp towards the east is Yerilla. There, manganese is the mineral associated with the higher grade ore, yet adjacent to

HINTS

to

Prospectors and Owners of Treatment Plants

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Kookynie manganese spells poverty. At Menzies the gold is frequently associated with galena and zinc blende.

All favourable places have been tried and worked with more or less success, and it is mostly these that are now receiving attention.

Gold is not easily found. But if the present day prospector works hard and intelligently he will make enough to live on, and perhaps a little more, and he will always have the chance of a rich find.

Don't shift camp too readily; first consider the surface indications and, if they are favourable, make a thorough test for a distance of at least $1\frac{1}{2}$ miles from camp in all directions. After heavy rains look for surface gold, examine for any floaters, and ascertain by dollying if they contain gold and mineral. They may indicate that values exist below the surface soil and decomposed country rock. Be patient in loaming and, if traces of gold are found, eastean for values in close proximity, then sink on a vein or lode and follow values; even when given out, continue sinking, if indications are favourable. Keep the dolly pot going, and clean it after each sample.

Never attempt to go down any abandoned shaft that has no connection to another shaft. It may contain the foul air called carbon dioxide. Lower one or two candles, either in a bucket or petrol tin, to the bottom. If they remain alight this shaft is free from carbon dioxide. Even when sinking a new shaft in very flat and heavily timbered country repeat these precautions every day. To overcome this danger, divide shaft with brattice cloth or thick hessian just behind ladder end, leaving about 18

inches for travelling way. Be careful not to set fire to brattice cloth when travelling up or down ladders.

It is wise not to venture into new country that is timbered or very flat without first taking your bearing from the sun and a watch to indicate the time you travel in a certain direction. Do not venture too far until you become acquainted with the bush. When in breakaway country do not attempt to wander in it without a reliable compass.

Always be observant: rich finds are got mostly by careful observation. If indications puzzle you, seek advice before abandoning any area taken up. Ascertain from the School of Mines the nature of rock by sending in rock samples for determination. Do not accept hearsay evidence that the district is patchy and difficult. Persevere and you may discover values exist in most unexpected places and in strata different from any yet observed by others.

Gold occurs in Western Australia as alluvial or lode deposits.

Alluvial ground consists of practically all surface deposits, and the gold in it occurs loose and is recovered by dryblowing. Surface indications show what places are worth trying, or a piece of gold may be specked.

If surface gold is found it may indicate shallow or deep alluvial. Sink in the most likely place, you may bottom on clay or cement. Examine bottom for leaders, and sink through the settled country, which may contain the source of supply of the alluvial gold. A deep lead has more pipeclay at bottom as a rule, and is usually found in flats be-

tween two rising grounds or a rise on one side only, and is due to denudation and weathering, the gold may have left the rising ground and penetrated into deep or shallow gutters.

Lodes are altered country rock, and when they are mostly quartz are called "reefs." These occur along shear planes, and generally form an outcrop above the surrounding country. Where the lode matter is soft there will be no outcrop, and the lode may be covered up with surface material, but there will be pieces of rock or lode material somewhere about and near the covered-up lode, and it is these the prospector wants to look for—indications—and by dollying pieces of rock he may trace their source. Another method is by loaming above likely localities; loaming is filling the pan with earthy material and washing it for colours. This method needs care and experience. Only when colours are got can it be of use.

Almost without exception, when gold occurs it occurs in the greenstones or dark-coloured rock. The granites are light-coloured and not favourable, though it is pretty certain the light-coloured rocks have had some influence in the occurrence of gold, as they are never far away from the rich lodes and reefs.

Always carry a few sample bags, and note where you get samples from. Use the dolly-pot all the time; it is the surest guide. Always clean out the pot with clean quartz after dollying a rich sample. Don't worry about assays, the dolly is sufficient for the prospector. If you want to test the sulphides roast the dollyed ore on a piece of iron in the camp fire till red, and then pan off.

ing it; and if the ore happens to be of payable grade, you are earning revenue at once. These are the advantages of sinking at the ore body.

A grab sample can be taken from the broken ore as it is pulled to the surface. A small portion is taken from each bucket. This can then be dealt with on the lines set out in the article "Notes on the Taking and Preparation of Samples for Assay."

LOAMING.—Outcrops at one time occurred in profusion, but the sharp tooth of time has eaten most of them away. Weathering, disintegrating, and shedding are the three last stages in the history of outcrops. Gold is set free, and survives, either in that place, or further down the hill. Gold being six times heavier than ordinary rock, is more difficult to transport, and will settle into rifts and hollows, perhaps in what is a water-course in a wet season. When the prospector comes on the scene there is a cover of soil. He tests the water-course and finds traces up to a certain point. From here he works up the hill, testing the soil systematically. When this "loaming" ceases to yield traces of gold, or when there is marked diminution, it is time to put in a costean. A great deal of labour may be saved by using an auger for lateral prospecting. Shallow pits are sunk on the line of the proposed costean, and the intervening ground is bored by an auger with a jointed stem made of water pipe. An auger capable of boring 12 feet, can readily be carried, and in this case the pits could be 20 feet apart. By panning off the borings the ground can be thoroughly prospected. Note, however, that it may pay to continue still further up the hill, not only to the point where the signs of gold perceptibly fall. There may be a lower grade leader or lode higher up the slope. One of the most important functions in modern prospecting, especially in this State, is to locate large low grade deposits. Consider present investigations into Tindals, Great Victoria, Big Bell, Wiluna, etc. Rich shoots are of course valuable to the prospector: they make it possible for him to continue, but he should keep the other possibility in mind. The "loam" should be got from shallow pits, not from the actual surface as a rule.

If you find a promising area peg it out, and apply for it within ten days and get an officer of the Department to have a look at it.

When panning off samples, particularly lode material, use clean water where possible. Thick muddy water tends to keep fine gold afloat; thus, where high-grade ore has been previously panned off, the following samples might easily be "salted" by getting colours from the muddy water.

When prospecting quartz or lode material that has been shed from an ore body, gather a general sample of the loose material. Do not confine your attention to what you consider the likely looking stone, as it sometimes turns out that it is the unlikely looking material that carries the values. Having taken the general sample, break a portion of each stone or lode fragment, retaining the other portion. Dolly the general sample, and if gold is present the source can be found by a process of elimination. Try each retained piece separately.

Sometimes quartz outcrops to the surface mixed up with other oxidised formations, and associated with mineral. This is a sign there may be sulphide ore underneath. In these circumstances sink through to sulphide, then cross-cut to adjacent strata, which may form a schist foot or hanging wall. Along these shear zones values are often found.

Standing off the shaft so as to intersect the ore body at a given depth may prove unfortunate. The ore may be impoverished where you intersect, and even laterally where you drive. Good values may exist immediately above the point of intersection. The shaft should be sunk on the ore body so that, while developing your mine, you are also prospect-

DRY-BLOWING.

A well-known dictionary speaks of "a method adopted in Western Australia for freeing pounded gold ore from the powdered matter when water is not available. It consists in slowly pouring the crushed material from one dish to another, and blowing away the powder with the mouth, as it falls, when there is not wind enough to do the work." Really this is more like vanning than dry blowing.

Then there is the "shaker." The "shaker" apparatus consists of a vertical series of sieves arranged in a light portable frame. The coarsest sieve (sheet iron, with punched holes) is at the top and rejects the largest fragments. What passes through to the second sieve contains all the fines, but there is still some coarse stuff for the second sieve to reject. There are two or three sieves. The frame is made of springy material, laths or bush sticks, and is usually home-made, but not always. The frame is given a rocking motion and, as the fines pass from sieve to sieve, the wind blows away the light dusty particles. The remainder under the last sieve is a concentrate that should contain all the values. It is still necessary to pour from dish to dish (from an elevation of two or three feet) to permit the wind to get rid of the bulk of the dust. The final concentration is made with water and a panning-off dish.

The actual Dry-blowing machine is a more elaborate shaker, with a bellows that blows up through the sieves, and makes the operation more independent of the help of the wind.