

The Progress of Prospecting

By Robert Annan

EDITOR'S NOTE:—Mining is still in its infancy in the Philippines. Consequently, prospecting is one of the most important stages of the development of the industry. The following abstracts are from an article by a prominent London engineer, that appeared in the Centenary Number of *The Mining Journal of London*. It is a graphic story of the first step in producing metals from the earth. This is the first in a series tracing the life of a mine from its inception to its final peak of production.

The last hundred years have seen a rapid and unceasing growth of the mining industry, and in this period the annual output of metals has been multiplied 20 to 30 times, so that the opening years of the present century have witnessed a production greater than that recorded for all previous times. The replacement of ore supplies depleted at this rate is obviously a matter of supreme importance, and is being accomplished in a variety of ways.

Reduced costs and improved methods are making possible the reopening of abandoned mines and the treatment of ores too complex for the metallurgical processes of earlier times. Another influence is the gradual expansion and extension of known districts. Finally there is the discovery of entirely new deposits, of which in recent years the copper deposits of Northern Rhodesia and the gold fields of New Guinea have been amongst the most outstanding.

A hundred years ago the demand for base metals was limited and only a fairly rich deposit where water troubles were not acute could expect to pay.

Fortunes, however, were being made in the copper mines in Cornwall, and the prospects of gold and silver in Mexico were being eagerly debated. The discovery of gold in California in 1848 and in Australia three years later gave the first great impetus to prospecting, and in a few years over a million emigrants left England to seek their fortunes overseas.

The first object of the prospector in those times was a rich gold deposit, usually, alluvial, which he could work himself, but mining knowledge spread rapidly and alluvial prospecting, as might be expected, led inevitably to discovery of the original source of the metal, as instanced by the Comstock lode, Leadville, Bendigo, and Ballarat.

The prospector then was a pioneer, travelling on foot with a few pack animals, his chance of making and retaining a find

being greater the more he ventured into untravelled country and the more he was alone. The mining camps of the world, active and dead, are monument to the qualities of these men, their courage in overcoming every conceivable difficulty and hardship, and their native skill in reading the signs which led them to the goal. It is amazing to consider the countries into which they penetrated and the distances which they covered, travelling always far ahead of the resources of civilization.

Much has been written about prospectors' luck and the chances which have led to great discoveries, yet it is often forgotten that the prospector had first created his opportunity by the long and painstaking search which led him into mineralized country. The chase after a strayed horse; the specimen stone picked up to throw at a dog; these are just the finishing touches and are less fortunate than they seem.

The discovery of gold in California, in digging the tail race for a water wheel, was certainly fortuitous; in Australia it was the result of a deliberate and intelligent search.

The search for entirely new deposits today must be carried out under almost exactly the same conditions. The only important differences are that the long initial stages of the journey may be made by modern means of travel in a fraction of the time, and that a wider range of deposits can be considered of value. The actual nature of the search in new and unexplored country remains essentially the same. Even the motor car requires some kind of a road, and the aeroplane, a landing place. They will take the prospector a long way, but in the end he must resort to the old methods.

Once the discovery is made and preliminary development is started, the picture is entirely changed. In the place of animal transport, and hand drilling, there is every resource of modern technical development. The internal combustion engine has revolutionised both transport and power generation by the portability, not only of the engine, but of its fuel. Even the Indian no longer paddles his canoe.

For indicating the extensions of a deposit and many of its structural features, there are a number of geophysical methods, the value of which is increasing with accumulated experience. The deposit can frequently be followed in depth by means of core drilling, which is now commonly carried out to depths over 5,000 feet.

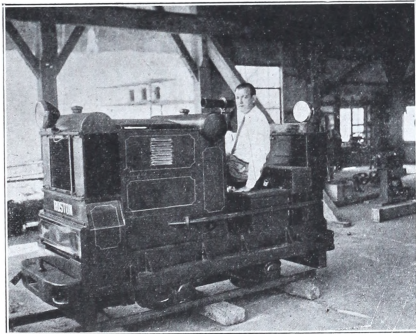
Finally, photography from the air is available for rapid and detailed survey, as an aid to geological study of the ground and to an interpretation of its features.

The further development is carried the more valuable these modern aids seem to become, and in the extension of old districts and the re-opening of old mines, where the general nature of the geology and of the ore deposits being sought is already known, they may become a paramount importance.

In the main, modern technique has tended to accelerate the work and render it less laborious without changing its essential nature. So far as new deposits are concerned, the prospector must make actual contact with them, open them up and sample them just as he has always done, and only when something of potential value has been discovered can more modern methods be applied to accelerate further work.

The value of these methods is most apparent in bridging the gap between the prospect and the developed mine, particularly in guiding development and reducing misdirected work. In the end the orebody must be blocked out, but this work can now be directed with greater certainty.

Compared with shaft sinking and development, core drilling is rapid and cheap. It is, however, difficult to carry out in some formations; not all deposits will yield a satisfactory core, and the sample is of an infinitesimal size. When well done, it can give excellent indications of where development should be carried out or where it should not be done at all. It is



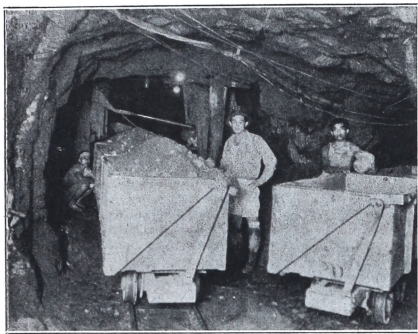
Diesel Locomotive for Underground Work

First of its type at Baguio, this locomotive at the Big Wedge mine at Baguio is being watched with general interest

(Please turn to page 28)

Starting the Year Right

Nearly P3,000,000 for the First Month of 1936



Underground at Antamok Goldfields—third richest mine in the Islands. Hand tramping ore from chutes to mill

Although nine of the gold producing companies shipped less of the yellow metal in January than in December, the total production for the period was but P225,000 below the all-time record of the last month of 1935.

Demonstration was the only mine to hang up a new record; this it did by going over the P100,000 mark for the first time with P116,444, a gain of P30,000 over December. Suyoc Consolidated equalled its own mark of P104,000, while Benguet Exploration and Baguio Gold noted substantial increases.

The newest gold mining operation in the Islands, Cal Horr, owned by Benguet Consolidated, got off to a flying start with a production of P54,889 for its first month of operation. Everything ran smoothly, and there will be a substantial gain this month.

Much of the loss in bullion production during January was caused by construction work preliminary to increased tonnage. This was particularly true at Itogon, Suyoc Consolidated, Masbate Consolidated, and I. X. L.

One reason for lower figures in many cases is that December, 1935 was an exceptional month, with new records being made consistently. While many of the plants failed in January to surpass these figures, none of them were far behind—and, you know, you can't make records at every trial:

Antamok Goldfields.....	P 266,666
(includes Gold Creek)	
Baguio Gold.....	89,000
Balatoc.....	1,076,661
Benguet Consolidated.....	777,759
Benguet Exploration.....	24,151
Cal Horr.....	54,889
Demonstration.....	116,444
Ipo Gold.....	50,347
*Itogon.....	165,000
I. X. L.....	40,676
Masbate Consolidated.....	78,224
Salacot.....	45,075
*Suyoc.....	104,000
*United Paracale.....	85,000

P2,973,892

*Estimated by Mars-man and Company.

Progress of Prospecting—(Continued from page 19)
particularly valuable in obtaining data on geology and on changes in character in depth.

Geophysical methods have made, and are still making great progress, but they are still purely qualitative and give little or no information on the value of the ore. In many cases they are not applied to the ore at all but to some "marker" associated with it. Faults, shear-zones and dykes can be detected by these means and in many cases, the depth to the upper surface of an underlying formation. These methods are all a matter for experts, far more skill and experience being required in the interpretation of the results than in making the observations. Without such experience the deductions may be grossly misleading.

Aerial photography has also made great strides and is now more than a rapid and approximate method of topographical survey. The prospector or geologist on the ground is always handicapped by limited radius of vision and needs a plan on which to plot his observations. Photography not only provides such a plan, but when used stereoscopically gives a picture of the relief of the ground. This, with other evidence, such as changes in vegetation, in soil colour, in the courses of streams, may afford most valuable evidence on geology and structure when used in conjunction with observation on the ground.

Like geophysical work, its value may be said to increase as general knowledge increases of the district in which it is used, and it is significant that its most successful applications up to the present have been in districts about which a great deal was already known. While the amount of evidence obtainable from photographs, even in wooded country, must be seen to be believed, it is not a method which can be used by itself in the hope of discovering ore deposits in new territory. Like all the new methods it has suffered from the extravagance of the claims made for it, usually by those who have no knowledge of it.

Belief in the divining rod is not yet dead, at least among those professing the use of it, and strange instruments are offered to detect all metals at almost any depth. Mining engineers have yet to be convinced of their value.

(Please turn to page 26)

The

REAL SMOKERS

PREFER THEM

REGIOS

TABACALERA

CIGAR

TELEPHONE 2-25-77

Men of the Mines



Colorado School of Mines Alumni. This organization is the only group of its kind in the Islands. There are about 30 Colorado School of Mines men in the Philippines.

Left to right, bottom row, K. H. Hanson, E. C. Butzer, E. C. Bengzon, C. G. Scott, R. Keeler. Second row, G. T. Geringer, C. I. Desmunt, I. W. Buchanan. Back row, C. E. Osborn, H. B. Parfet, W. E. Heinrichs, Leo Gump, C. W. Burgess. Standing in back is E. C. Rice.

Carlos Sylvestri is now on the staff of the I. X. L. Mining Company in Masbate as mine shift boss. He was formerly connected with Balatoc and with Demonstration, and recently returned from a trip to Europe.

Kenneth H. Hanson has transferred from Baguio Gold to Demonstration, where he is a mine shift boss.

Charles Cushing, formerly connected with Marsman and Company, is now a mine shift boss at Balatoc.

A. C. Melting, recent graduate of the University of Washington, arrived in the Islands recently to join the staff of Demonstration as mine shift boss.

S. L. Rohrer has been transferred from King Solomon to Suyoc Consolidated, where he is now assayer and engineer.

R. E. Wilson is now mine shift boss at Itogon. He was formerly on the staff of Atok Gold.

J. O. Enberg has returned from an extended vacation in the States, and is now head of the northern division of Marsman and Company. J. O. Grenan, manager of the southern division of the company, will leave soon on a vacation, while J. B. Stapler, who has been northern division manager, will be stationed in Manila and in Paracale.

G. T. Geringer, consulting engineer for the Sulu Mining Association, has been in Baguio this month in connection with his duties as chairman of the board for the examination of mining engineers. With E. C. Bengzon, also member of the board, he has been working on recent examination papers written by mining engineers.

Progress of Prospecting—(Continued from page 23)

Prospecting, and the subsequent development of an orebody, are not haphazard processes. The fundamental principles have changed but little and luck only plays a minor part. To have any real chance of success the search must be intelligently planned and carefully executed. Where mineral deposits are found only systematic development will establish their value and make them available for profitable exploitation. All this requires both time and money, but there is no real short cut, and to neglect the principles is to court failure and loss.

Fate Gives Britain...—(Continued from page 5)



Windsor Castle, Where George V Lays in St. George's Chapel.

"Tell him when the Prince of Wales was over in our country he told me to look up his old man some time, and here I am." Rogers was admitted, and not only had a long talk with King George but also stayed to lunch. George V humanized his kingship well.—W. R.

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