GEOLOGY

Mineral Wealth Detection

A new technique, which can predict accurately what metals and minerals can be gotten out of the earth, has been developed. It can penetrate "iron curtains" abroad.

➤ A METHOD of predicting accurately what mineral riches can be mined from the earth, both here and abroad, even before ore deposits are explored or discovered, has been developed by S. G. Lasky, chief of the mineral resources section of the U. S. Geological Survey, Washington.

The new technique, revealed to the 75th anniversary celebration of the Colorado School of Mines, Golden, Colo., promises to be useful in the "cold war" as a means of telling what metals and other minerals foreign nations can produce.

Already successfully tested on such diverse deposits as gold, copper, silver, nickel, vanadium, phosphate and manganese, the Lasky method uses a consistent mathematical relationship between the grade of the ore and the tonnage mined.

"Mining geologists have long appreciated that in many deposits there is a gradation from relatively rich to relatively lean material," Mr. Lasky said. "Tonnage increases as grade decreases."

Finding that no one had determined the precise relationship, Mr. Lasky discovered a consistent relation between tonnage and grade according to the classical equation of analytical geometry: x equals a plus b times log y. Applied to minerals, the grade is x and the tonnage is y, while a and b are constants that vary with the kinds of deposits.

What we can get out of the earth can now be predicted even before the deposits are fully known. The new formula has been fruitfully applied to manganese in Arizona, vanadium and phosphate in Idaho and Wyoming, gold in Alaska, and to nickel deposits.

"Iron curtains" can be penetrated and U. S. experts have more hope of determining just how much manganese is likely to be mined in Russia, India or South Africa, how much platinum in Russia and Canada, tin in Malaya and Bolivia, etc.

The new resources studies by this and other methods can help us to determine where to turn now that Russia has cut off manganese exports, and a Spanish-Italian cartel has increased mercury prices to unprecedented levels.

It will be profitable for us to appraise our mineral wealth, Mr. Lasky warned the mining engineers and geologists. But present knowledge is inadequate as less than a tenth of our country is mapped on a scale satisfactory as a basis for search and appraisal.

Whether the Lasky method of mineral reserves can be applied to uranium, the atomic bomb metal, is not known, and it was not discussed by Mr. Lasky. Uranium mining has been on a relatively limited scale, production figures are held secret by all nations now, and geologists are unlikely to make any public predictions.

Science News Letter, October 8, 1949

CHEMISTRY

Bright Finish for Metals

➤ BY merely dipping in a chemical solution some metal products are given a bright, reflective finish without mechanical polishing by a new process developed by Battelle Memorial Institute in Columbus, Ohio. The method will be known as chemical polishing.

Its chief advantage in production is its simplicity. Items of intricate form can be quickly polished to a high mirror-like luster by this dip treatment. The surface obtained may serve as the final finish surface or as a base for subsequent plating. A 50% reduction in finishing costs over ordinary mechanical or electrical polishing may be possible with the new process.

It works best on nickel silver, copper alloys, especially 70-30 brass, Monel metal, nickel or aluminum. It can not be used on steel, stainless steel or die cast metals.

The baths into which the metal parts are dipped for chemical polishing contain a mixture of acids, the basic ones being phosphoric, nitric and acetic acids. They operate at ordinary room temperatures and up to 200 degrees Fahrenheit. At the lower temperature, action in the bath is slower and longer immersion is required. Immersion periods vary from 10 seconds to 10 minutes, depending on the initial finish of the surface being treated, the final finish required, and the operating temperature of the bath.

Following the dipping, the work is rinsed and dried. If it is desired to plate over the chemically finished surface, this can be done without further treatment of the surface.

The chemical polishing process has already been well tested on many metal products. Those successfully polished include brass, copper, nickel-silver, Monel, nickel and aluminum. The action in each case is a true polishing action and the reflective surface obtained is in the polished base metal, not in a deposited coating of a different metal.

Science News Letter, October 8, 1949

RESOURCES

Oil Drought in 15 Years; Industry Seeks Substitutes

➤ AMERICAN oil reserves will run out in 15 years and against that day the petroleum industry is spending large sums to develop synthetic fuels, a research director declared.

However, the switchover to synthetic gasoline is not imminent because when natural petroleum is exhausted shale oil and coal should supply our needs for upwards of a thousand years. These oil industry prospects were described by C. K. Viland of the Tide Water Associated Oil Company, Martinez, Calif. The occasion was the seventy-fifth anniversary of the Colorado School of Mines, held at Golden, Colo.

Of the $100,000,000 that is spent each year on petroleum research, Mr. Viland said that "a fair share . . . is presently spent on experimental work with synthetic fuels." The industry intends to "take the leadership in developing methods for making fuels and lubricants from sources other than crude oil in the future."

Although the American oil reserve is only "equal to about 15 years' current usage," Mr. Viland pointed out that "Colorado oil shales can produce at least an-

"CHEMICAL POLISHING"—In a test of the new process, a spoon which has just been polished experimentally by dipping in a chemical polishing bath is rinsed prior to inspection of its surface.