

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

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-

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



"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.

other 100 years' liquid fuels supply." Fuel can also be extracted from coal "and U. S. coal deposits contain enough energy for perhaps 1,000 years at the present rate of consumption," he added.

To the industry that supports it, research pays big dividends, Mr. Viland said. He cited one company which "has realized a profit of \$15 for each \$1 spent."

Science News Letter, October 8, 1949

MEDICINE

Childhood Ills Hit Aged

► CHILDHOOD diseases, so called because they primarily attacked infants and children, are now shifting their attack to the oldsters in our population.

This paradox of an increasing infectious disease death rate among the aged at a time when such deaths are becoming almost rare among children is most dramatically emphasized by a series of cases of diphtheria. They are reported by Dr. Henry D. Brainerd of the University of California Medical School in *GERIATRICS*, scientific journal on diseases of old people.

Diphtheria from time immemorial has been considered a childhood disease. In the past it has been widely believed that 80% of diphtheria cases occur among children less than 10 years of age.

Yet among 147 unselected cases of diphtheria treated in the San Francisco City and County Hospital, almost one-third were over 45 years of age. This, the physicians pointed out, is only one instance of accumulating evidence that diphtheria is increasing proportionately as well as numerically among the aged.

This increase can be accounted for by surveying recent medical history, the physician said. Until 20 years ago diphtheria immunity was acquired by exposure to the disease, either with or without subsequent illness. After that time immunity was acquired by artificial immunization of children.

But many people who grew up before artificial immunization must have failed

to gain natural immunity, and they are now contracting the disease in their later years.

Further, diphtheria is more deadly to the elderly than to younger people, though the infection itself appears not to be more serious. The difference seems to be that elderly people are more susceptible to the toxins which cause death. Mortality among the San Francisco group was 29.9% among those over 45, and 17.3% among the younger group.

The physicians also included a group of patients with pneumonia and one with meningitis. Again, the infections appeared not to be more severe among the aged; and the antibiotics were able to knock out the infections among the aged as readily as among the young.

But the handicap of damaged hearts, lungs, kidneys and other organs which accumulate among the aged appears to make survival more difficult for this group. In lobar pneumonia only 4.8% of those below 45 years of age succumbed, in contrast to 29.3% over 45 years of age. The contrast was even greater in broncho pneumonia, the mortality being 60.8% for those over 45 and only 9.6% for those under 45.

Dramatic contrasts were presented also among the meningitis groups. Five times as many persons over 45 died of meningococcal meningitis as in the younger group; while in pneumococcal meningitis the ratio was two to one.

Science News Letter, October 8, 1949

GENERAL SCIENCE

Famous Mansion Given To Scientists

► ONE of New York's famous mansions just off Fifth Avenue is the new home of the New York Academy of Sciences.

Given to this 133-year old science body by Norman B. Woolworth, it is expected to become an important center of science.

Science News Letter, October 8, 1949

SCIENCE NEWS LETTER

VOL. 56 OCTOBER 8, 1949 No. 15

48,500 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAtE 4439.

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