

SCIENCE NEWS

THE AGE AND DEPTH OF MINES

Department of the Interior

OLD mines are not very deep and deep mines are not very old, on the average, according to Dr. Thomas T. Read, acting assistant to the director of the Bureau of Mines, Department of the Interior, in a recent statement on the deep mines of the world.

The oldest mines in the world of which there is any certain record are the copper and turquoise mines of the Sinai Peninsula, which were worked by the Egyptians as early as 3700 B. C., but these have never been sunk to what would now be considered even moderate depths. The silver-lead mines of Mount Laurion, in Greece, are very old. Xenophon, writing in 355 B. C., said, "They were wrought in very ancient times," but, as the mineral occurs along the contact between approximately horizontal limestones and slates, it is hardly possible to speak of the mines as having any depth at all, except in the sense that a tunnel has depth beneath the top of the mountain it pierces. The Phoenicians probably began to work the tin mines of Spain and Cornwall as early as 1500 B. C. Although tin mining in Cornwall has been carried on continuously until modern times, the DoIcoath workings, the deepest, were not sunk further than 3,300 feet, as the cost of tin produced from such depth was too great to compete with that from surface workings in Malaysia.

The various other mines in Europe are not very deep. The Sulitelma mine, in Norway, has an inclined shaft 3,700 feet deep, and is of particular interest because it is the only deep mine north of the Arctic Circle; it was opened in 1887. Generally speaking, the deepest mines of Europe are coal mines. Coal mine shafts in Great Britain are as much as 3,500 feet deep, while many of the coal mine shafts in Belgium and France are over 3,000 feet deep and several shafts are now being sunk which will go to a depth of 4,000 feet.

Most of the mines of South America might more accurately be called high rather than deep. The Braden mine, in Chile, one of the big copper mines opened in recent times, is entered at the bottom and worked up. The copper mines at Cerro de Pasco, in Peru (started as a silver mine in 1630), are only about 1,000 feet deep, though they are at an elevation of 14,000 feet above sea level. There are some small mines in South America at even greater elevations than this, but the only really deep mine in South America is the St. John del Rey mine in Brazil; which is the deepest mine in the world. Its workings extend to a depth of 6,726 feet vertically below the top of the main shaft. This depth is reached by a series of connected shafts, like a flight of stairs. This is a gold mine which was started in 1834, and the region in which it is situated is the oldest mining region in the New World, gold having been continuously mined there for well over two hundred years.

The gold mines of the Transvaal, South Africa, take second highest rank for depth. The Village Deep work-

ings extend to a depth of 6,263 feet, and there are so many mines of which the workings are over 4,000 feet in depth that it would make too long a list to mention them. The City Deep has made plans to work to a depth of 7,000 feet.

Australia has many mines and some of them are quite deep, the Victoria Consolidated, at Bendigo, being over 4,600 feet deep, and the New Chum is over 4,100 feet deep. At Kalgoorlie, in Western Australia, there are several mines from 2,000 to over 3,000 feet deep.

The deepest mine workings in the United States are those of the Calumet and Hecla Consolidated, on the Keweenaw Peninsula, Michigan. The copper deposits are inclined and the deepest workings are 5,990 feet vertically below the surface. The deepest vertical shaft is the Tamarack No. 5, 5,309 feet deep; the Red Jacket vertical shaft is 4,900 feet deep. There are several inclined shafts in this district which are over 8,000 feet long, but vertically they are not so deep as those mentioned. The deepest workings of the Calumet and Hecla represent the nearest approach man has made to the center of the earth, since they are about 4,600 feet below sea level. The other deep mines of the world are at higher elevations and consequently do not go so far below sea level. The deepest gold mine in the United States is in California, where the Kennedy Mining and Milling Company has a vertical shaft 4,200 feet deep. The Argonaut Mining Company, nearby, has a shaft, inclined at 60°, which is 4,850 feet long. None of the coal mines in the United States is notably deep; one mine in Illinois has a shaft 1,004 feet deep.

Holes have been bored much deeper into the earth than mine workings have penetrated, but no one has, of course, ever been to the bottom of such holes. The deepest hole in the earth is in West Virginia, where it was bored to a depth of 7,579 feet in search of natural gas.

THE SWEDISH ARCHEOLOGICAL
EXPEDITION*Science Service*

CROWN PRINCE GUSTAF ADOLF, heading the Swedish archeological expedition which is excavating the ancient city of Asine, Greece, has unearthed evidence that the so-called saddle-roof was known in Greece more than 3,000 years ago. The architecture of that Mycenaean or pre-Hellenic period, is partly illustrated by fragments and ruins found at Mycenae. It has long been a question whether these houses had flat or sloping roofs, but word has just come from Greece that the Swedes at Asine have discovered and explored a tomb, which no one has entered or disturbed for 3,000 years, and have found that this tomb is in the shape of a house about 24 feet square cut into the rock, with the top cut into the exact form of a saddle-roof, with two sloping sides and gables at the ends.

The Crown Prince's expedition, which has now been at work a number of years, has just completed the

spring term of excavation, and is returning to Sweden in order to make a scientific study of the treasures found. Up to date, more than 500,000 important treasures and fragments have been found, which are being classified and studied at Lund University by special permission of the Greek government, to which the bulk of the finds must eventually be returned. The finds include decorated vases, funeral urns, gold ornaments, silver and copper coins, etc., which illustrate the civilization and art during thousands of years of history in Asine. This city, situated on the Greek Peloponnesus, flourished and fell a number of times during the pre-Christian era. And a discovery just made by the Swedish expedition points to a surprising gap in its history. The excavators, after having cleared the strata which contained relics dating to about 300 B. C., found that the level directly beneath this contained a layer of relics undoubtedly belonging to a period about 1600 B. C. The scientists are now hoping that other excavations may throw some light on what had happened during the intervening 1,300 years.

One of the most important discoveries made at Asine this year is that of a house which expert archeologists from other countries pronounce the first house of the geometric period thus far excavated. A description of this house is, however, not now available.

The Swedish expedition will resume its field work in the autumn of this year.

A HEALTH STUDY OF SWEDEN

Science Service

THE complete investigation of personal health records extending back through several generations and covering a whole nation has been undertaken by the Swedish Institute of Racial Biology, the first government institution of its kind in the world, which has just turned in the report of the second year of its work.

Under Professor H. Lundborg, who organized the institute, anthropological statistics have now been gathered concerning 83,427 persons. Stature, head measurements, color of eyes and hair, diseases, especially hereditary diseases, causes of death, etc., are among the things observed by the investigators. In the northern provinces of Sweden, where Lapps, Finns and Swedes have intermarried, the death rate is relatively high. Special genealogical studies have, therefore, been undertaken in this region in order to ascertain, if possible, what effect race mixture has on longevity. In three villages, for example, genealogical histories have been drawn up for the entire population covering a period of 125 years. In another community the histories of 1,200 families have been traced during the period 1781-1851. Another subject that at present occupies the attention of Professor Lundborg and his assistants is the ancestral history of twins and triplets. During last year the genealogies of 137 pairs of twins were drawn up and studied.

Research into the histories of families is greatly facilitated by the unusually accurate parish registers which have been kept and preserved for hundreds of years, and also by the fact that the entire history of any given

family is usually confined to Sweden. There has been almost no increase of the population through immigration, and the Swedes are said to have preserved greater racial purity than any other Teutonic people. Incidentally, it is shown by archeology that the history of the present inhabitants of Sweden goes back 5,000 years in the same place.

The accumulation of data regarding hereditary disease, the development of criminal instincts, and other traits is only a part of the program of the Swedish Institute of Racial Biology. It is also conducting research work into the elimination of racial taints through eugenic measures. Research is also being directed into the field of eugenics and the development of individual talent and genius.

ITEMS

Science Service

THE Kaibab National Forest, on the northern rim of the Grand Canyon of the Colorado, is threatened by a small beetle, just about a quarter of an inch long. This creature is known only by his scientific name of *Dendroctonus ponderosa*, but he is famous as a destroyer of trees. The Kaibab forest contains two billion feet of standing timber and is one of the greatest game preserves in the country, extending 25 miles along the canyon rim. The U. S. Forest Service has declared war on the beetle, and with the Bureau of Entomology proposes to spend \$25,000 this summer in a campaign of extermination.

ON one of those lonely island specks in the largest of oceans, known as the Hawaiian Bird Reservation, is a peculiar species of teal which has lost the power of flight. This wild duck can be easily run down by a man on foot. But as men do not come to his island once in a blue moon it would seem safe. However, it has to have fresh water and the only fresh water on the almost barren island is a small pool. Should the encroaching sands cover the pool, which seems likely, this rare flightless duck must die.

THE world's largest direct current high-voltage generator has been developed by S. R. Bergman, consulting engineer of the General Electric Company at Schenectady, and is expected to make clearer the programs broadcast long distances by radio. It is also claimed that by the use of this machine for electric railroad work the number of sub-stations now required can be reduced one half. Rectified high voltage alternating current is now used for distance broadcasting. Rectifying alternating current, however, produces ripples which affect the clearness of the transmitted sound. Direct current generators give current that is perfectly smooth.

AN unusual occurrence of ice in the North Pacific has been reported to the U. S. Hydrographic Office by the master of the American steamer, "West Jessup," who relates having seen "a large and a small piece of drift ice" in latitude 41 degrees 38 minutes north, and longitude 144 degrees, 2 minutes east. This is about 100 miles off the coast of Japan.