

of the earth accessible to man. The rate of use of some of these metals is doubling each decade. We still use tin-foil for wrapping up sweets and cigarettes. At the present mining rates, iron will be exhausted in Germany in about fifty years and in the United States in about a hundred years. The supply of sulphur in the United States will fail in fifteen years, the coal of Germany in less than a thousand years and of the United States, notwithstanding its huge lignite deposits, in less than fifteen hundred years. It looks as if the machine age may starve to death before long, a victim of to-day's profligate use of metals, coal and oil. Water power, alcohol from vegetation, solar energy, etc., are at present totally inadequate to replace oil and coal. Will future civilisations look back upon the industrial civilisation of the twentieth century as an age of robbery?

#### U.S. Bureau of Standards

THE annual report of the Director of the Bureau of Standards (Government Printing Office, Washington, 1932) shows the trend of scientific developments during last year. The increase in the industrial applications of very low temperatures has made it advisable to extend the scale downwards from  $-100^{\circ}$  C. to  $-259^{\circ}$  C. and a temporary scale covering this range has been established. Fire tests have been made on the new welded steel floors which are now being used in buildings. They consist of steel floor plates welded to beams spaced two feet apart. Tests were made with fire both above and below the floor. Gas appliances found quite satisfactory at sea level develop defects when used in cities at high altitudes. The causes of these defects are being investigated. Perhaps the most spectacular advance made during the year has been to increase the accuracy of the primary frequency standard to one part in ten million. Regular transmissions of standard high-frequency waves at a frequency of 5,000 kilocycles per second are broadcast every Tuesday for four hours. The accuracy obtained is one cycle per second, that is, one part in five million. The ionised layer in the atmosphere has been determined to be the major controlling factor in the long distance transmission of radio waves. The measurement of the height of this layer is of primary importance in interpreting transmission conditions and increasing our knowledge of radio wave transmission. Using improved equipment, these measurements were made on one day in each week throughout the year. An automatic recorder is now in use which makes continuous measurements. Useful work is done in making careful analyses of samples of ores, alloys, pure metals, cement and pure chemicals. These samples are sold to industrial laboratories and are used for checking their own methods and results. This plan has contributed greatly to the precision of the analytical work in these laboratories and the project is self-supporting.

#### Miners' Nystagmus

Two reports on this subject by a Committee of the Medical Research Council were issued in 1922 and

1923. The principal finding of the Committee was that the chief symptom of this disease—the involuntary oscillation of the eyeballs—is caused by an insufficiency of the light reaching the eyes of the miner while at work, and that the most important measure of prevention is to secure for the miner at work adequate illumination. Nevertheless, in spite of considerable improvement in the illumination of mines, the incidence of the disease has, on the whole, steadily increased, for compensation on account of this disability was paid to 10,638 persons in 1930; this is the largest number, with one exception, during the past twenty-three years. The Medical Research Council has therefore considered it advisable to reconstitute the Committee, which has now issued a third report on the subject (Special Rep. Series, No. 176. H.M. Stationery Office. 9d.). This reaffirms, in the strongest terms, the conclusions of the former committee. There should be constant illumination of 0.25 foot-candle on the coal face, and it is understood that there are recent developments in the direction of improving illumination in mines. To account for the continued prevalence of the condition, it must be recognised that the oscillation of the eyeballs is but a part of the disease, and various psychoses and neuroses are also present. The practical treatment of the disease should consist in the elimination of a hopeless dependence on compensation by the provision of opportunities for work of some kind, even if restoration of full work underground has to be preceded by a period of work in daylight.

#### Guard Posts for Road Island Refuges

ILLUMINATED guard posts or 'bollards' are now gradually coming into use on all types of roads which carry fast vehicular traffic. In the *Osrham G.E.C. Bulletin* for February, a description is given of a well-designed guard post which should prove useful not only by indicating the refuge to pedestrians, thus prompting them to cross the road at that point, but also to motorists; thus removing a frequent cause of accidents. It is a luminous pillar 4 ft. high, the light being emitted only from the side which faces the traffic. The back of the pillar is made of solid steel tube, so that in the event of a smash the damage done will be probably much less than if it were made of cast iron. The head of the bollard is arranged as a lantern with the red glass fixed around half its circumference. The red glass is generally illuminated by a sixty-watt lamp but sometimes a small auxiliary lamp is used as well so as to prevent a complete 'black out' if the main lamp is extinguished. Complete isolation of the bollard from the electric supply in the event of damage is easily obtained by opening a door near the ground level where the time-switch and fuses are fixed.

#### Researches on Sedimentation

THE report of the Committee on Sedimentation for the two years 1930–1932 has been published under the auspices of the Division of Geology and Geography of the U.S. National Research Council as National Research Bulletin No. 89, 1932 (pp. 229, price