

as a keen mountaineer and rock climber as well as geographer. A visit to East Greenland as a member of Mr. J. M. Wordie's expedition of 1926 confirmed these interests. More recently he has analysed long-period temperature records in the north of England and revealed the gradual warming of our winters since 1820. The close resemblance between these changes and those for Stockholm suggests that this matter is of far more than local significance. In these early records Mr. Manley sees a valuable source of information that may throw light on the greater climatic changes of the Pleistocene Ice Age. Mr. Manley is, too, a keen but balanced advocate of the geographer's contribution to meteorology. This was the theme of his second presidential address to the Royal Meteorological Society. The Buchan Prize in 1943, the Symons Lecture in 1944, and the Murchison Grant of the Royal Geographical Society in 1947, all marked Mr. Manley's contributions to climatology; but his papers also include other branches of geography, particularly the history of cartography. Mr. Manley remained at Cambridge long enough to see the University give somewhat belated recognition to meteorological studies by setting up a Meteorological Committee, of which he was the first secretary.

Iron and Steel Institute Awards

THE Council of the Iron and Steel Institute has made the following awards: Bessemer Gold Medal for 1948, to Mr. W. J. Dawson, formerly of Hadfield's, Ltd., in recognition of his contributions to the development of steel castings and to the production of alloy and heat-resisting steels; Sir Robert Hadfield Medal for 1948, to Mr. A. Preece, reader in metallurgy in the University of Leeds, in recognition of his researches on the scaling and on the overheating and burning of steel; Williams Prize for 1947, to Mr. R. Fowler, of Richard Thomas and Baldwins, Ltd., for his paper on "Blowing out a Blast-Furnace", printed in the *Journal of the Iron and Steel Institute*, 155, 513 (1947). The presentations will be made on May 5 during the annual general meeting of the Institute.

American Institute of Biological Sciences

AN American Institute of Biological Sciences has recently been established. The rapid advance of the biological sciences and their impact on human welfare have created new problems relating to the development and application of those sciences. During recent years many biologists have recognized that the biological sciences suffer from the lack of a service organisation, which would help the various biological societies to discharge more effectively those functions which are of common concern to them all, but which they cannot adequately exercise as individual societies. The new organisation is designed to fill this need as well as to serve the biological sciences in other ways. A governing board has now elected the officers and an executive committee. Recognizing the potential importance of this new undertaking for the advancement of the biological sciences, and through them for all biologists, the U.S. National Research Council has not only endorsed the programme, but has also agreed to make available the general services of the Council. As a part of the National Research Council, the Institute will also provide biologists with an agency through which they can maintain close relations with governmental activities and with other fields of science represented within the Council.

The Fall Webworm of North America in Europe

DR. PAUL SURÁNYI, University of Agricultural Sciences, Budapest, states in a letter that the first specimen of the moth of fall webworm (*Hyphantria cunea* Drury) to be caught in Europe was found in the vicinity of the Danubian Free Port of Budapest in 1940. Hitherto it has not been observed outside the United States and Canada. The way it has increased shows that its caterpillar has found very favourable conditions of life in Europe. Nests of the caterpillars were first observed in 1943; since then it has increased rapidly, and during 1945-46 it did considerable damage in orchards and on various trees. It was distributed over a semicircular area with a diameter of 80 km. in 1946, which has now increased to 200 km. Indeed, this destructive insect has overrun two-thirds of Hungary, has reached the borders of Czechoslovakia and Yugoslavia, and is approaching those of Austria and Rumania. North of Budapest it is seldom observed, due probably to the prevailing north to north-west wind. Its favourite feeding-plants—the same as in North America—are *Acer negundo* L. and *Morus alba* L., from the latter of which it strips the leaves in groves and along the highways. But it feeds on all fruit-bearing and garden trees, and—what is much more dangerous—it has established itself also in the woods. Fifty-eight species belonging to different genera are known to be food plants; they include oak (*Quercus* spp.), alder (*Alnus glutinosa* L.), black locust, (*Robinia pseudacacia* L.), common stinging nettle (*Urtica dioica* L.), cabbage (*Brassica oleracea* L.), and also horseradish (*Armoracia lapathifolia* Gilib.). Two generations of the fall webworm normally hatch in a year. Its swift spread seems to be due not only to suitable conditions, but also to the fact that, so far as Dr. Surányi's experience goes, the caterpillars are seldom attacked by European parasites.

Mechanics of Packings of Granular Material

IN view of the many technological fields where an understanding of the properties of granular materials is fundamental, it is surprising that there has been little systematic investigation, the present inchoate body of knowledge being derived from *ad hoc* studies. In reviewing the more recent literature, D. R. Hudson (*Machinery*, 70, 617, 681; 1947) discusses work on packings of material in bulk carried out by investigators in the fields of geology, fuel technology, the ceramic industry, civil and chemical engineering, and powder metallurgy. This widespread interest may account partly for the diffuse study in industrial research. On the academic side the present preoccupation with the fine-structure of matter has led to the neglect of Osborne Reynolds' pioneer work on packings, undertaken in the 1890's in an attempt to provide a mechanical explanation of the universe.

Hudson's review is more concerned with the structure and characteristics of a compacted granular bed—the voidage and number of interparticle contacts and their dependence on particle size and size distribution, the relative size and the shape of the container—than with the effect on the structure of deformation of the packing, which is of especial importance in earth pressure theory, in the study of handling and conveying mechanisms and in the design of hoppers, bunkers and silos, where Reynolds'