

scopy in their respective spheres, except that the non-biological institutions mentioned that especial emphasis should be given to optical microscopy. The replies included eleven from sources outside the United States, but their requirements were almost identical with those from the industrial non-biological institutions, differing only in that 'skill in photography' was asked for in preference to 'knowledge of allied instruments'.

In almost all cases the duties expected of a trained electron microscopist were expected in a high order of perfection—not just to maintain the instrument,

but to maintain it 'at its peak'—thus demanding a maximum of experience and training in the field and indicating a preference for postgraduate training.

Dr. Watson referred to the great shortage of research electron microscopists in the United States of America and stated that a strong plea could be made for graduate university courses in electron microscopy where men from diverse fields could be trained in the fundamentals of the subject and conduct electron microscopical research in their respective fields leading to postgraduate degrees.

S. WEINTROUB

## FREEZING FISH AT SEA

A PRIMARY aim of the work at the Torrey Research Station of the Department of Scientific and Industrial Research is the improvement in quality of fish as sold to the consumer. Particular attention has been paid to the problem of fish, principally cod, caught in Arctic waters, since the earlier part of the catch may be some twelve days old when it is landed. During the voyage the fish are stowed in holds in crushed ice, and it is obvious that the quality at landing could be markedly improved if the fish were quick-frozen soon after catching. "Report on an Experiment into the Freezing of Fish at Sea" (pp. 65+6 plates. London: White Fish Authority, 1957. 5s.) is a record of an extensive and impressive large-scale experiment to examine the practical feasibility of such a scheme of quick-freezing at sea. The technical developments were undertaken by the Department of Scientific and Industrial Research, and in the field work the White Fish Authority and the trawler owners gave full co-operation.

Five main phases of the technical work are fully described: (1) the experimental development in the Torrey engineering laboratories of a suitable type of freezer for whole cod; (2) the sea-trials of a prototype freezer in the Station's motor fishing vessel;

(3) collection and analysis of operational data on fourteen typical trawler trips to northern waters, to provide a design basis for a full-scale plant; (4) the construction and shore testing of the full-scale freezing plant and the conversion of a typical trawler, *Northern Wave*, to take the installation; (5) the results of the eight experimental voyages with the freezing plant in action.

The freezing plant has a capacity of about 8 tons of fish per day and roughly 23 per cent of all fish caught was quick-frozen. Freezing was effected by direct-contact plates through which refrigerant at  $-40^{\circ}$  F. was circulated, and the frozen blocks were stored at  $-20^{\circ}$  F. in a specially installed cold store.

Details are given of the marketing experience and reaction to the product, and the financial and economic implications are summarized. The scale of the experiment was not large enough to permit of firm conclusions on all these points, but the findings should be of marked assistance to trawler owners contemplating the adoption of freezing at sea. The outstanding feature of the experiment was the successful performance of the freezing equipment under all weather conditions, and the technical feasibility of the project was amply demonstrated.

## CARTOGRAPHY

THE first volume of the official records of the first United Nations Regional Cartographic Conference for Asia and the Far East consisted of the report of the Conference. This has now been supplemented by a second volume\*. Of this, the first 22 pages, or about one-sixth, consists of summary records of the discussions, which took as their starting point a recognition that "accurate maps are a prerequisite to the proper development of the world resources which in many cases lie in relatively unexplored regions", and that topographical mapping must necessarily precede geological or other specialized surveys. Delegates were concerned largely with the need of the less-developed countries for technical assistance in both survey and map compilation; and with the means by which publication of further sheets of the International Map of the World on the Millionth Scale might be encouraged. The

\* United Nations Regional Cartographic Conference for Asia and the Far East, 15-25 February, 1955, Mussoorie, India. Vol. 2: Proceedings of the Conference and Technical Papers. Pp. x+133+2 maps. (New York: United Nations; London: H.M. Stationery Office, 1957.) 1.50 dollars; 11s.; 6.50 Swiss francs.

"Technical Papers" follow and vary from an account of the status of publication of the International Map accompanied by communications on its future from various interested parties to descriptions of some of the most recent developments in survey methods.

The report on the "International Map of the World on the Millionth Scale"\* is, except to the cartographically well informed, a most misleading document. It misleads particularly by its index map, which conveys the impression that the Map itself is well on the way to completion. This is far from being the case, and since it is important that scientists generally should be aware of the realities of the situation regarding this basic map of the world, it is well to recall the history of this project.

The original proposal for an international map of the world on a scale of 1:1 million (about 16 miles to 1 in.) was made by Prof. A. Penck at the International Geographical Congress in Berne in 1891. It

\* International Map of the World on the Millionth Scale: Report for 1955 prepared by the Secretariat. Pp. iii+84+1 map. (New York: United Nations; London: H.M. Stationery Office, 1957.) 0.80 dollars; 5s. 6d.; 3.50 Swiss francs.

was recognized from the outset that the standard of the surveys from which it would be compiled varied greatly in different parts of the world, but it was felt that if the sheets were published in a uniform style and those features which had only been roughly explored were clearly distinguished, a very useful map would result. It was discussed at succeeding (4-yearly) conferences and by 1910 detailed specifications for projection, sheet lines, conventional signs and layer colouring had been drawn up, with the object of ensuring that sheets published by different countries should be as much a part of a uniform series as if they had been issued by the same publisher. By 1914 about a dozen sheets had been published. During the War several sheets were issued in styles closely approximating to that specified, but the Paris Conference of 1913 had ruled that sheets not completely conforming could not be regarded as part of the International Map, and in the first report of the Central Bureau of the *Carte Internationale du Monde* (1921) two index diagrams were printed—one showing international sheets and the other sheets sufficiently similar to be conveniently used to supplement them. This distinction was confirmed by the conference of 1928 and firmly adhered to in the period between the Wars. Some of the most important contributions, including the American Geographical Society's series of sheets of Hispanic America, which was commenced in 1922 and completed in 1945, fall in the latter category, though they closely resemble International sheets.

In 1939 a map on this scale was again found to be most useful, and many sheets were prepared by military establishments. As time went on, they departed more and more from the specifications for the International Map and by the end of the War the position was very confused. In September 1953 the functions of the Central Bureau at Southampton were transferred to the United Nations Cartographic Office and an attempt was made to find out what had been published. The first result was an index diagram in *World Cartography*, Vol. 3. The report

of the regional cartographic conference referred to above contains a reproduction of this diagram, which bears the date January 1957, though *World Cartography*, Vol. 4, which was published in the first half of 1956, and was devoted entirely to the International Map, contains a later diagram showing many more sheets, particularly in Asiatic Russia and Australia. It also contains most useful reproductions of the resolutions of 1913 and 1928.

The report for 1955 on the International Map of the World on the Millionth Scale (published in 1957) again shows more sheets, this time mostly of China. In both cases it is explained that the additional sheets are not necessarily newly published, but that their existence had not previously been reported to the United Nations. However, an inspection of the tabulated list of sheets reveals the fact that a great many, particularly of these additional sheets, are published by either the Geographical Section of the General Staff of Great Britain, or the Army Map Service of the United States, and are for "official use only, and not for sale or distribution". What is not revealed is the equally important fact that in general they depart considerably from the specifications for the International Map, though it is made clear that many of those of China are in black-and-white only and in the Chinese language. In fact, almost no reference is made to the distinction so carefully drawn in the years before 1939 between International and other sheets. Since the latter have become so very heterogeneous, some of them having little except projection and sheet lines in common with the International Map, the report is of little value as a guide to the present state of what used to be known as the *Carte Internationale du Monde*. It would be a great pity if the challenging but very desirable and, one hopes, not unattainable objective of a homogeneous series of maps covering the whole world which for so long received the support of many distinguished geographers and surveyors should become obscured by a welter of second-rate publications, not all of which are even on public sale. A. M. FERRAR

## INSECTS OF MICRONESIA

THE attention of students of the terrestrial Arthropoda in general is directed to a series of publications by the Bernice P. Bishop Museum, Honolulu, Hawaii, entitled "Insects of Micronesia". The geographical area covered includes practically all the oceanic islands of the north-western Pacific Ocean west of the 180th meridian and north of the equator. The chief island groups are the Marianas, Carolines, Marshalls and Gilberts, and the isolated islands are Ocean, Nauru, Wake, Marcus, the Bonins and the Volcano Islands. Altogether, Micronesia comprises some 2,400 islands under the administration of the United States, the United Kingdom and Australia. The former Japanese possessions, the Bonin Islands, Volcano Islands and Marcus, are now under United States mandate.

This series is based largely on the collections made between 1947 and 1953 by the Pacific Science Board (U.S. National Research Council) with the financial support of the U.S. Office of Naval Research, but much material was collected during the Second World War by American Service-men and previously by Japanese workers headed by Prof. Teiso Esaki, of

the University of Kyushu. Since 1953 the work has been financed by the U.S. National Science Foundation, which has also assisted in the publication of the series.

"Insects of Micronesia" is planned to appear in twenty volumes which will be published at irregular intervals when ready. Vol. 1, which explains the scope and aims of the series as well as discussing the environment and natural history, was published in 1954 and is by Dr. J. Linsley Gressitt, entomologist at the Bishop Museum and leading spirit in this ambitious project. Vol. 2, published in 1955, is a comprehensive bibliography together with a subject index and is by Prof. Teiso Esaki, E. H. Bryan, jun., and J. L. Gressitt. Vol. 3 will be devoted to the Arachnida, Vol. 4 to the Crustacea, and Vols. 5-19 to the insect orders, followed by a summary in Vol. 20. Although none of these volumes has been completed, twenty-two parts have been issued to date.

This work is being undertaken by 115 specialist authors representing about fifty institutions in some thirteen countries, and is an example of the international effort required to deal with the vast assem-