

## THE WEATHER IN THE ANTARCTIC

IN the recently published Meteorological Office Geophysical Memoir No. 94\*, Mr. H. H. Lamb reports on his work as meteorologist aboard the whale factory ship *Balaena* during the antarctic summer of 1946-47. The *Balaena* carried aircraft for spotting whales, and Mr. Lamb's task, so far as immediate operations were concerned, was to forecast weather and swell for the aircraft and the small whale-catching vessels. Broadcast observations were collected to compile once daily a synoptic map of much of the southern hemisphere, which was used in conjunction with local observation for the forecast work. No observations were received from other whaling vessels, and observations south of Australia, South Africa and South America were very scanty. Though meteorological observations have, of course, been taken in antarctic waters by numerous expeditions, it is believed Mr. Lamb operated the first weather-forecast service there.

It was found that knowledge of the structure and movements of pressure systems, air masses and fronts gained in the northern hemisphere was, after experience of the effects associated with the pack ice and topography of the Antarctic Continent had been gained, perfectly applicable in the Antarctic. Although the nearest reporting station was sometimes two thousand miles away, the forecasting work was very successful. Special attention in the forecasting work was paid to the sub-tropical anticyclones, as their positions and intensities largely determined the movements of the main warm-air steering currents of depressions. Care, too, had to be taken to maintain on the charts all fronts which might affect the ships.

\* Air Ministry: Meteorological Office. Geophysical Memoirs No. 94: Meteorological Results of the *Balaena* Expedition, 1946-47. (M.O. 584b.) By H. H. Lamb. Pp. 68+5 plates. (London: H.M.S.O., 1956.) 8s. 6d. net.

The general weather over the Antarctic Ocean was very disturbed, with one depression soon following another and the only sunshine occurring in a break of a few hours in the clouds every three or four days. As the cloud system of one depression moved away, the next could always be seen approaching. For a short period the ship was less than a hundred miles from the Antarctic Continent, and in off-shore winds the sky was sometimes quite clear. In spite of the great amount of cloud and the fact that there was rain or snow on 122 of the 151 days spent in the Antarctic, the precipitation measured was only 43.6 mm. water, equivalent to an annual precipitation of 4 in. a year—a desert value. The value is not to be taken very exactly owing to the difficulty of giving only just enough heating current to the rain-gauge to melt the snow and no more, and also to loss of catch by the disturbance to airflow caused by the ship. Cumulo-nimbus clouds were frequent, and inversions only occurred occasionally.

The mean pressure south of 50° S. was only 982 mb., and the maximum only 1013.4 mb. These values are much lower than over corresponding areas of the northern hemisphere and suggest that there is unequal sharing of air between the hemispheres. Mr. Lamb, using all the available information, gives in the memoir a mean pressure map of the southern hemisphere. This has a weak anticyclonic area over the Antarctic Continent (pressure about 1,000 mb. reduced to mean sea-level), a ring of depressions off the edge of the pack-ice of central pressures about 980 mb., and then a steady rise to the sub-tropical high-pressure belt in 30° S. Daily weather maps show that the south polar anticyclones cannot be regarded as permanent and that the general situation over the Antarctic Continent is sometimes cyclonic.

## CONSERVATION OF FISHERIES

A CONFERENCE on fisheries conservation was held in Rome during April 18-May 10, 1955, and was attended by delegates from forty-five countries. The conference was convened by the United Nations Organization in order to assist the International Law Commission in preparing draft articles on basic aspects of international law on fisheries, and a report was presented to the Commission in June 1955. The papers read at the conference have now been published\*. They include important general contributions on fisheries resources and regulation by M. Graham, M. B. Schaefer, G. Belloc, W. C. Herrington, J. L. Krask, G. L. Kesteven and S. J. Holt, as well as summaries of actual international conservation problems such as the North Sea fisheries (C. E. Lucas), the Pacific halibut (H. A. Dunlop) and the Fraser River salmon (L. A. Royal). That it should be possible to control and conserve such diverse fishes indicates how much scientific knowledge has advanced in recent years.

Mr. Graham stresses that T. H. Huxley's dictum—let the fisherman be free—should be followed unless there is evidence that fishing activities are seriously

influencing the yield of a fishery. He points out that among the effects of over-fishing one must distinguish a decline in total yield from a decline in catch per unit effort or a decline in average size of fish. The latter two effects may not be a sufficient reason for regulating a fishery, although from economic causes (lack of recruitment of boys to the industry, no market for small fish) they may limit it. Dr. Schaefer expounds the whole theory of fishing and the equilibrium catch; and although he mentions the maximum economic catch, it is apparent that he regards the production of the maximum sustainable yield as the main object of conservation. This thesis underlies most North American fishery regulation; but the maximum yield does not seem to have been obtained yet from the Pacific halibut. From Dr. Schaefer's own contribution on the tropical tunas, it would seem that high catches of yellowfin tuna near the limit of sustainable yield during 1948-51 resulted in an economic regulation of the fishery to a lower level in later years. In the North Sea all three effects of over-fishing have been experienced, and the recent international agreement on mesh sizes goes only part of the way to solve the problem.

Other interesting papers deal with the influence of the environment (J. B. Tait), the behaviour of fishes in relation to the environment (M. Fujinaga, J.

\* Papers presented at the International Technical Conference on the Conservation of the Living Resources of the Sea, Rome, April 13 to May 10, 1955. (United Nations Publication, 1956. I.B.I.) Pp. xli+371. (London: H.M.S.O.; New York: United Nations, 1956.) 22s. 6d. net; 3 dollars; 13 Swiss fr.