

REVIEWS

THE POLAR REGIONS IN THEIR RELATION TO HUMAN AFFAIRS

By LAURENCE M. GOULD. Bowman Memorial Lectures, Series 4. *The American Geographical Society, New York, 1958. 9 x 6 inches; iv + 54 pages, Appendix, 20 figures, 3 sketch maps; \$3.50.*

This, the fourth lecture in the series presented as a memorial to the late Isaiah Bowman, is the second to be of particular interest for readers of *Arctic*. Many will already be familiar with the earlier address "Glacier Variations and Climatic Fluctuations" by Professor H. W. Ahlmann of Stockholm.

The American Geographical Society has a long-established interest in arctic research and exploration, and one of its publications, "Problems of Polar Research", remains well worth consulting even 30 years after its first appearance. In the preface to that book Dr. Bowman wrote: "a world conference on objectives in polar research seems eminently desirable". Whereas no such conference has yet been called, the many meetings required to organize polar aspects of the International Geophysical Year and its "continuation" have in effect provided an international scientific consultative body, in this way achieving the ends Dr. Bowman presumably had in mind.

Laurence M. Gould provides in his own career a link both with polar activities in the late 1920's, and with the recent I.G.Y., during which he served as Director of the United States Antarctic Program. It is, therefore, natural that his lecture should touch on the early years of polar exploration, the subsequent economic developments; and also the I.G.Y. activities, which were going on when the lecture was delivered in January 1958. As his title emphasizes the author is more concerned with the significance of the polar

regions in human affairs than merely with their utility as a great geophysical laboratory.

The book falls naturally into several distinct parts. Most important is, of course, the full text of the original lecture, which is here divided into three chapters: "The North Polar Lands", "The South Polar Lands", and "Antarctica in the I.G.Y.". Noteworthy for its own sake is a group of twenty photographs, chosen to reveal the polar regions as they are today. This is not the traditional mixture of seals, polar bears, igloos, Eskimo, icebergs, and penguins. We see instead an "aerobee" rocket carrying scientific instruments being fired from Churchill; a view of Isachsen weather station on one of the Queen Elizabeth Islands; a P2V aircraft arriving from New Zealand at the Ross Island sea-ice runway in Antarctica; scenes of modern antarctic whaling; and dairy cattle in the Matanuska Valley of Alaska. Several new maps also make a distinct contribution. They include one of the North Polar Lands, illustrating the limits of the Arctic and Subarctic, and the distribution of scientific stations participating in the I.G.Y. program. Unfortunately, the excessive reduction of this map may make it necessary for some readers to use a magnifying glass to obtain full benefit from the data shown. A corresponding map of Antarctica employs the "Antarctic Convergence" (the belt surrounding the antarctic continent where water of low salinity and low temperature sinks below the more saline and warmer surface layers of 800 m. to 1200 m. thickness) as an outer limit, and also shows the participating stations operated by the twelve nations sharing in the I.G.Y. program. The next map combines two seemingly unrelated factors and in so doing draws attention to a third. It shows "Political

Claims on the Antarctic Continent", and "Accessibility of the Antarctic Coast". The former recalls the traditional territorial claims of New Zealand, Australia, Norway, and the United Kingdom and by less bold lines, those of France, The Argentine, and Chile. In drawing this distinction the cartographer has, perhaps unintentionally, stressed a very real difference that is often overlooked. The historical record suggests that the claims of the four nations first listed are grounded on scientific and administrative activity over a considerable number of years, whereas a degree of recognition has been granted the last two largely because of their fortunate location in the Western Hemisphere. The sector of Antarctica still without a claimant (that between 90°W. and 150°W.) is revealed as the only one with a coast shown for its entire length as "inaccessible to unre-enforced surface vessels in southern summer". Much of it could in fact be shown simply as "inaccessible from the sea"; it has remained unclaimed, and to a considerable extent unexplored, largely for this reason.

A new bathymetric map of the Polar Basin on a scale of 1:25,000, printed in colour, is a valuable extra dividend included in the book. It is the first such map to show relatively recent discoveries concerning the topography of the sea-bottom in the central arctic basin. Acknowledgement is made for much of the detail to a 1957 publication by Dr. V. F. Burkhanov of the Soviet Northern Sea Route Administration. The reviewer believes that it is regrettable that the compiler of the map was permitted to label the ridge extending from the New Siberian Islands to Ellesmere Island "Lomonosov or Harris Ridge". In using the first name the Soviet discoverers paid tribute to an outstanding 18th-century Russian scholar, as it was their privilege to do. The wholly gratuitous addition of the second name adds nothing to the scientific reputation of Harris, but may serve to convince Soviet scientists that some enthusiasts for the cold war see even in submarine topography an excuse to do battle. This comment in no

way reflects on Dr. Gould, whose text makes no mention of the map, and who, on the contrary, is always generous in his references to other countries. The same map introduces the term "Laurentian Basin" for a depression west of Ellesmere Island. The reason for the term is obscure and it can be criticised as being remote indeed from the point of origin of the term "Laurentian".

An Appendix "Sovereignty in Antarctica" records the pertinent data, including essential documents, supporting the claims of seven nations to territory on the antarctic continent itself, and of others to off-lying islands. Still other nations, six in number, with antarctic interests but no formal claims, are also included; outstanding among them are the United States, U.S.S.R., and Japan.

The text of Dr. Gould's lecture, which was delivered in the attractively informal style that so many of us have learned to admire, is a valuable summary of the present situation in the polar regions. In discussing the North it stresses development of resources and strategic considerations, and the concluding sentences of this section deserve quotation as reflecting the views of scientists of all nations whose work has taken them into the region:

"It is tragic that the real possibilities for economic development should be over-shadowed and obscured by the defence preparations I have described. Granted peace, the economic strategic importance of the northlands will exceed their military significance."

Antarctica provides scope for only a brief discussion of the development of natural resources, in which the important whaling industry is mentioned. It may be worth while, in the face of a good deal of rather loose talk to the contrary, to quote the author's view on antarctic minerals: "At the present time we know of no commercial deposits of any mineral whatsoever in Antarctica". Whereas there is little new that can usefully be written about sovereignty in the Arctic, this subject continues to be a source of controversy

in the Far South. Even the claim to be discoverer of the continent itself is disputed—more usually between supporters of Britain's Bransfield and United States' Palmer, although in the latter case a fellow American, Burdick, has also become a contender. In recent years the Soviet Union, not to be outdone, has suggested that the Czarist admiral von Bellingshausen is the rightful claimant. However, as Dr. Gould implies, it is surely more important to discuss the future of the area than details of its remote past. In this "the successful co-operation of the I.G.Y. in Antarctica" may not only ensure that its scientific secrets will be uncovered for the good of all, but also that the collaboration so achieved may provide a much needed example to nations in other parts of the world.

TREVOR LLOYD

OCEANOGRAPHIC ATLAS OF THE POLAR SEAS, PART II, ARCTIC

H. O. Pub. 705, Washington, D.C.: U.S. Hydrographic Office, 1958. 12½ x 16 inches; 143 pages, 132 figures; \$5.00.

The Oceanographic Atlas of the Polar Seas, Part II, Arctic will be released for distribution in June 1959. It completes the first oceanographic atlas in a series, which will ultimately cover all ocean areas. Part I, covering the antarctic region, was published in 1957 and is now in its second printing.

Previous to this compilation no atlas provided such comprehensive coverage of all elements of the marine environment of the arctic regions; although there are a number of excellent publications prepared by various countries, which cover selected areas of the Arctic, or treat special topics only, such as ice, of the entire area.

The preface introduces Part II with a recapitulation of arctic explorations by the United States, beginning with the expeditions of Griffin, DeHaven, and Kane, into the Davis Strait-Baffin Bay area together with some passages of the Canadian Arctic Archipelago while searching for the ill-fated Franklin Expedition in the mid-nineteenth century.

The scientific achievements of the search expeditions and of later United States expeditions to the Arctic were primarily of a geographical nature, but included some information on natural history subjects. Only in recent years has the emphasis been placed on the study of the environment. Since World War II sustained efforts by the United States and other nations in oceanographic and meteorological research have added materially to our knowledge of the arctic environment.

Charted information is presented in the atlas on a monthly or seasonal basis depending on the distribution and the manner of variation of the particular environmental element. Charts in the atlas were prepared during 1957 and early 1958 from all data then available. The atlas is divided into seven sections, and there is a bibliography of 125 major reference sources.

In the section on tides and currents data are presented on charts showing tidal types; co-tidal lines; tide range; general surface circulation; surface currents of parts of the Arctic Ocean and adjacent waters; major drifts of vessels and ice islands; circulation of Atlantic water in the Arctic Ocean and adjacent seas; and the dynamic topography of the Greenland-Norwegian Sea. Physical properties, such as temperature, salinity, density, water colour, and transparency, as well as selected vertical sections are shown on other charts.

The section on ice occupies a good portion of the book and ice charts constitute about one-third of the figures. Presentations include concentration of ice and extremes of ice conditions; variability of lead width and concentration; comparison of ice conditions in 1955 and 1956; comparison of the polar pack boundaries along the Alaskan and Canadian coasts for the years 1953 to 1956; comparison of ice pack boundaries in Baffin Bay and Davis Strait for 1953 to 1956; freeze-up and break-up dates; and probability of superstructure icing. Special treatment is given to the period of ice formation. On account of the marked changes of ice conditions during the spring, summer,