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,

and fall seasons, they are presented in biweekly charts for selected areas where observations are sufficiently numerous to allow this.

The wind, sea, and swell section gives surface wind roses and shows the state of sea, swell, accumulated heights and periods for surface waves, the directional distribution of periods, and sea heights for selected coastal stations.

Bathymetry, bottom sediments, earthquake epicentres, volcanoes, structural trends, major rock types, gravity, gravity anomalies, variation of the magnetic compass, range of disturbance in total magnetic intensity during a low sunspot year, and a chart of the auroral zone make up the graphic presentation of marine geology.

Charts showing intensity of fouling, distribution of marine algae and seagrasses, deep scattering layer, and distribution of marine mammals, are included in the marine biology section. The last section of the atlas is devoted to the distribution of oceanographic stations and bathythermograph observations.

Reliability diagrams are included for some elements. The bibliography and charts of oceanographic observations give the principal sources of the data from which the atlas was prepared in detail.

A polar projection chart (equidistant azimuthal) that extends to at least 65°N. is used as the base for the areal analyses shown in the atlas. With the exception of the ice distribution this polar base chart seems to be suitable for all presentations. For the ice section the base chart could have been extended to provide a complete coverage of ice conditions to the southernmost winter extent of ice in the Bering Sea and along the east coast of Canada.

A few large scale charts on a Mercator projection are employed to present more detail. Cross-sections and histograms supplement the basic analyses of the physical properties and ice sections respectively.

For most publications the physical make-up is of little real importance other than for advertising and selling purposes; atlases, however, are in a different category in this regard, because their accuracy and utility depend to a considerable degree on their physical characteristics.

This publication is of a convenient size for desk and shipboard use, and is definitely an improvement over most previous Hydrographic Office atlases, which were extremely large and unwieldy. It is printed on high rag content nonabsorbent paper that should be serviceable for marine use. Multicolour printing is used, which allows the presentation of related parameters on one chart. The lithography in general is good. The atlas is permanently bound, but the paper cover is not in keeping with the otherwise high quality.

The price should put this publication within reach of everyone interested in polar areas. For the student it can answer almost every conceivable general question he may have on arctic marine environment; for the research worker it should serve as a basic reference book he could ill afford to overlook.

It is unfortunate that this atlas was not available prior to the I.G.Y. The charts it contains would have been very helpful in the development of the plans for various scientific endeavours. The two charts of oceanography stations are probably the best compilation available at present; they might well serve as a polar supplement to T. Wayland Vaughan's notable publication "International Aspects of Oceanography".

H. W. DUBACH