

EXTRACTS AND REVIEWS

ADMIRALTY MANUAL OF HYDROGRAPHIC SURVEYING

The *International Hydrographic Bureau* has recently received through the courtesy of the Hydrographer of the British Navy a copy of a new publication entitled "Admiralty Manual of Hydrographic Surveying" published in 1938 for the Hydrographic Department, Admiralty, by H.M. Stationery Office, London, and obtainable from J.D. Potter, Agent for the Sale of Admiralty Charts, 145 Minories, London E.C.3. Price : 15s - 0d net.

As stated in the Preface, it has been written to provide a text book in which modern methods of hydrographic surveying and instruments are described, and was prepared for publication by Commander R.M. Southern, Royal Navy, who was one of the British Delegates to the 4th International Hydrographic Conference held in Monaco in 1937.

It has naturally been assumed that the reader is acquainted with the general principles and practice of Navigation, and for this reason, subjects such as astronomical observations at sea, are only discussed in so far as ordinary navigational practice is modified to fulfil the requirements of the hydrographic surveyor, and reference to ordinary navigational instruments e. g. the sextant and chronometer, is curtailed to a minimum. Also in order to keep the size of the volume within a reasonable compass the reader is referred to other publications such as the Admiralty Tide Tables part III, articles on Subaqueous Sound Ranging in the *Field Engineers Bulletin* of the U.S. Coast and Geodetic Survey etc., for more detailed information on certain subjects which require separate study for a proper exposition.

The Manual consists of about 460 pages of text divided into twenty separate Chapters dealing with the various branches of Hydrographic Surveying including Tides and Tidal Streams, the compilation of Sailing Directions, Magnetic observations, Oceanographical observations and the production of charts from the Surveys.

The compilation of the book is clear and concise, and it should form a valuable addition to all hydrographic libraries.

J. D. N.

ADMIRALTY WEATHER MANUAL

The International Hydrographic Bureau has recently received a copy of the « Admiralty Weather Manual » 1938, published, by order of the Lords Commissioners of the British Admiralty, for the Hydrographic Department, Admiralty, by H.M. Stationery Office and obtainable from J.D. Potter, Agent for the sale of Admiralty Charts, 145 Minories, London E.C.3 ; price 10s-6d net.

This book consists of three sections :—

Section I. contains detailed instructions for the taking of Meteorological observations at sea, the use and care of Meteorological instruments and the forwarding of weather reports to the appropriate shore meteorological services.

Section II deals with the physical aspects of Meteorology and forms the theoretical basis of Section III.

Section III — Synoptic Meteorology — contains instructions for the plotting of weather charts, followed by discussions of pressure systems and the polar front. It concludes with a chapter on general forecasting illustrated by a number of specimen charts and forecasts.

The book contains 476 pages of text, 14 Tables, 167 figures illustrating the various articles and instruments and an extensive Index, and, although specially prepared for use on board H.M. Ships in view of the ever increasing importance of Meteorology as affecting Navigation in general, should be of the utmost value to all Mariners, being written in clear precise language easily understandable by those without previous technical knowledge.

J. D. N.

THE DIVISIONS OF THE CIRCLE

(Extract from *Askania Review*, N^o 7, Berlin.)

The adoption in topographic services of the division of the circle into 400g instead of the 360° division made us reflect upon why the 360° division is maintained at all in certain branches and upon the origin of the two systems.

The division of the circle into 360° dates back to antiquity. Already the Babylonians who observed the movements of heavenly bodies knew that the sun completes the zodiac once in approximately 360 days. Consequently 1° almost corresponds to the sun's daily travel. In addition, the division of the circle into 360° offers the advantage that this figure is easily divided by 2, 3, 4, 5, 6, 8, 10, 12 etc. The resulting arcs of a circle or the angles of 180°, 120°, 90°, 72°, 60°, 45°, 36°, 30° etc. are of great importance in connection with regular diagrams and with technique. The division of the circle, therefore, into 360°, has been maintained throughout the centuries.

On the other hand, the division of the entire circle into 400g (centesimal degrees) was only suggested about 150 years ago when establishing the metre as a unit of length. The metre is supposed to correspond to one forty-millionth of the earth's meridian, and the kilometre to one forty-thousandth of the entire circle, i.e. $0,01g = 1c$ (centesimal minute). However, as the earth is not exactly spherical, an angle of 1c does not always cover quite the same distance of the earth's surface. It was therefore decided to adopt as unit of length a measure deposited in Paris and called standard metre; consequently, the ratio between the unit of length and the 400g division is only approximate. The 400g division is thus closely related to the dimensions of the earth's surface, and for this reason has been utilised by various countries for quite a long time. In order to facilitate the exchange of results obtained by the countries in question, and in view of the advantages offered, the topographic services of numerous countries have systematically adopted the 400g division.

The fact that in changing over to the 400g division, the customary subdivision of 360° into 60' (minutes) of 60" (seconds) each, was also abandoned and replaced by decimals, is quite independent of the division of the circle into either 400g, 360° or any other number of units. Nevertheless, the habit of subdividing 1g into 100c or 100cc each, has been maintained, but this way of writing is equivalent to a decimal; for example $2g34c56cc = 2,3456g$. The designations of these sub-divisions are taken from the Latin: 1 degree (1g) is derived from "gradus" = pace, 1 minute from "pars minuta prima" — first diminished part, and 1 second from "pars minuta secunda" = second diminished part.

Besides the division of the circle into 360° or 400g, other divisions are in use. Certainly the nautical division is one of the very oldest. The compass card is divided into 4 by the four headings; between north and east, north-east (45°) is interpolated; between north and north-east, north-north-east (22 1/2°) is interpolated and between north and north-north-east, north to east (11 1/4°) etc.. In other words, the quadrant is subdivided into 8 parts, called "points". This division, with decimal subdivisions, is still to-day the basis for various sciences, as for instance artillery.