

EXTRACTS & REVIEWS

MÉTÉOROLOGIE ET PHYSIQUE DU GLOBE

(Meteorology and Physics of the Globe)

by

J. ROUCH

REVIEW.

Captain J. ROUCH, Professor at the *Institut Oceanographique* of Paris, has kindly presented to the International Hydrographic Bureau two volumes which he has just published on the Meteorology and Physics of the Globe.

These books "written by a mariner, for mariners", by an officer of long experience, seemed destined to render an important service to all navigators who give due consideration to the advantages which may be derived by the navigator from prediction of weather conditions and a knowledge of the maritime phenomena, so often essential for accurate and safe navigation. They will find in this work an especially useful selection of scientific facts of which they cannot afford to be ignorant.

The first volume is devoted to nautical meteorology. In a condensed, but at the same time very lucid form, he furnishes to the mariner all the means necessary to put into practice this part so essential to nautical science, taking into account the most recent progress in this field. We find there a description of some of the meteorological instruments in use aboard ship, a note on the precautions to be observed in their use, the corrections to be made and the limits of accuracy attainable.

In the chapter on maritime routes, after recalling the utility of the excellent charts of Brault and the Pilot Charts, the author examines the modern aspect of the problem, so different from that viewed by the sailing vessels or low-powered steamers, although account must still be taken of the kind of weather to be expected and eventually of the temperature.

This question of the kind of weather and the prediction of the weather is particularly well explained by the author, who has acquired special authority in these matters. He gives an especially interesting description of the formation of depressions, cyclones, typhoons and squalls, of the velocity of the winds and the principles of their prediction; and one may ascertain that although the older theories have often had to be modified as a result of more accurate and numerous observations, the rules for the manœuvres to be carried out to avoid the center of a cyclone or depression remain the same as those recommended of old. Two charts showing the isobars according to the Weather Bureau in Washington illustrate the chapters.

Chapter XV treats of fog, the conditions for its formation and the greater probability of its being encountered in anti-cyclonic regions.

The final chapter (XVI) describes briefly the optical phenomena of the atmosphere, sometimes considered as harbingers of good or bad weather.

The volume terminates with various tables destined to facilitate the conversions of units, the barometric corrections and the calculations for humidity. There are also tables giving useful data on the Beaufort scale, on clouds, information regarding the temperatures of several ports and on the rainfall, as well as a list of the names of special winds in certain localities, with their characteristics.

At the end is a small English-French vocabulary which will greatly facilitate the use of these documents for mariners using the English language.

The second volume deals with the Physics of the Oceans. Physical oceanography constitutes the greater part of the book, without however losing sight of its practical application to navigation.

Thus the question of the measurement of depth and that of the bathymetric Charts occupies the opening chapters and after a description of the Lucas sounding machine, particular mention is made of the echo-sounding devices, the use of which has spread to many vessels. Chapter III furnishes interesting results in the principal depths of the oceans of the globe and the irregular features of the submarine relief. We learn that although the expanse of the oceans is about two and one half times that of the continents, the volume of emerged land is scarcely the thirteenth part of that of the seas. Chapter IV condenses the most recent information regarding the nature of the bottom and the means for its determination.

Chapters V and VI deal with the determination of the temperature of the surface water and its salinity; it shows the value of a knowledge of the dip of the horizon, the proximity of the coast or of ice, of the rational handling of modern machines and the prediction of the weather. The charts giving the lines of equal temperature and equal density show in schematic form the mean results which one may expect to encounter.

Chapter VII give especial information on the movements of the sea and in particular the swell, as well as instructions to the mariner for the proper handling of his ship in a heavy sea.

Chapter VIII condenses the most indispensable instructions for navigation relating to the tides and tidal currents.

Chapter IX and X deal with the permanent currents in the oceans, their observation and their origins; the latter are particularly well elucidated. A schematic chart shows the general circulation of the waters in the oceans. The most important of these Currents, the Gulf Stream and the Kuro-Shivo, are the subject of special descriptions, in accordance with a very complete and up-to-date documentation.

Chapter XI describes the ice, the icebergs and the regions where they may be encountered, the signs of their proximity and the means used to reveal their approach.

Chapters XIII and XIV, describing certain characteristics of sea-water and in particular the water at great depths, are of special interest to physicists and oceanographers.

Chapters XIV and XV are devoted to a brief study of terrestrial magnetism and the distribution of the magnetic elements over the oceans, as well as atmospheric electricity and the auroras.

The last chapter gives some indication of the gravity measurements and its anomalies over the surface of the globe; on the volcanoes and submarine seisms, as well as the zodiacal light.

The volume terminates with several tables and an English-French vocabulary of oceanographic terms.

P. V.

