MORPHOLOGIE DES ATLANTISCHEN OZEANS
GRUNDKARTE DER OZEANISCHEN LOTUNGEN - 1 : 5 Millionen

by

THEODOR STOCKS — Berlin and Leipzig - 1937.

A new pamphlet has just appeared in regard to the "*Results of the* Meteor *Expedition in the Atlantic*". A list of the soundings and their geographical positions had already been published, as well as the profiles of the routes followed; but this was only a basis for the research work in the determination of the configuration of the depths of this ocean. A synoptic chart to the scale of 1: 20 million accompanied the list which could also only indicate the bottom configuration in a very general manner and this almost without justification, since the scale of the chart allowed only a very restricted number of soundings to be inscribed (1). Thus to-day we receive a very welcome addition by the publication of the chart of 1: 5 000 000 to which the author, Dr. Theodor STOCKS, has given the title: *Basic Chart of Oceanic Soundings*.

The author has not been content to inscribe merely the soundings obtained by the *Meteor*, but has also added all other soundings obtained by various scientific expeditions, which a close examination has permitted him to consider serviceable. This is a very useful work which makes it possible for anyone engaged in the study of the configuration of submarine relief to avoid recommencing a very long task, and a laborious research through numerous documents. The International Hydrographic Bureau has also undertaken a similar study for the establishment of the work sheets which, to a scale of 1 to 1 million at the Equator, are employed in the preparation of the General Bathymetric Chart of the Oceans to the scale of 1: 10 million. (*See* I.H.B. Special Publications N° 30). The scale adopted by Dr. STOCKS allows him to differentiate by means of conventions and special symbols the reduced soundings and the non-reduced soundings, the wire soundings and the echo soundings; to give some idea of the accuracy of the position of the soundings; to indicate the name of the vessel taking the soundings and the approximate epoch of the work; to note also whether or not a bottom sample was obtained. All of this information is extremely valuable.

This chart is therefore somewhat in the nature of a work sheet on which each holder is enabled to add for himself any new data which may reach him. Further he will have nothing to erase or change since the author has taken pains to avoid tracing the lines of depth contour on the chart or indicating the depth by any special tint. These lines of depth contour are to be found on an adjoining sheet of tracing paper, but the author has rightly given numerous points an hypothetical character, since the documentation is, often, still too inadequate to permit the lines to be definitely plotted.

For the purposes of this publication the Atlantic Ocean has been divided into 14 sheets of about 66 by 87 cm. of which we have as yet received only one of the sheets of the southern part. The projection selected is the equivalent azimuthal projection of LAMBERT (central equivalent meridian) which is the same as that used for the chart of 1: 20 million. This projection, which retains the true proportion of the surfaces, does not maintain the linear scale — which, however, is not done by any projection — but it does not change it very appreciably. In those parts far removed from the Equator, it distorts the angles and bearings; this is not a grave inconvenience for the study of oceanography and has the advantage of allowing the polar regions to be shown. It should be noted, however, that on this projection, which is predominantly a working projection, it is not easy to plot a point accurately on the chart in its proper latitude and longitude with relation to the network of curved lines which are not orthogonal.

For the rest, the scale of 1: 5 million is judiciously chosen, since it allows the inscription, if not of all, at least of an adequate number of soundings except in those regions very rich in soundings where a still larger scale might at times have been advantageous. The use of a very much greater scale, however, would not be without

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(1) See Vol. I, II and III of the "Scientific Results of the *Meteor* Expedition". See also *Hydrographic Review*, Vol. XI, N° 1, p. 138; Vol. XIII, N° 1, p. 95.

serious objections peculiar to work in the open sea, where the most accurate positions are based upon astronomical observations. One must agree, in fact, that on a chart worthy of the name, which pretends to something more than a schematic representation, the inevitable and accidental errors of position should be almost inappreciable on the scale of the chart. An uncertainty of 1 mm. on the scale of the chart appears to us the maximum which should be tolerated. Now, with the inevitable uncertainty in the astronomical fixes combined with that of the dead reckoning positions, the errors in position of the soundings must frequently exceed 5,000 metres, which is a length represented by 1 mm. at 1: 5 million. This lack of certainty, inevitable for the moment, in the location of the soundings taken in the open sea, appears to impose a limit upon the size of the chart scale employed to represent the relief of the ocean bottom out of sight of land. This is certainly one of the principal reasons why two soundings, which appear to have been taken at the same place, are at times very different; one should not be surprised when it is considered that one can only rarely affirm that they are not separated by five kilometres or even more.

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