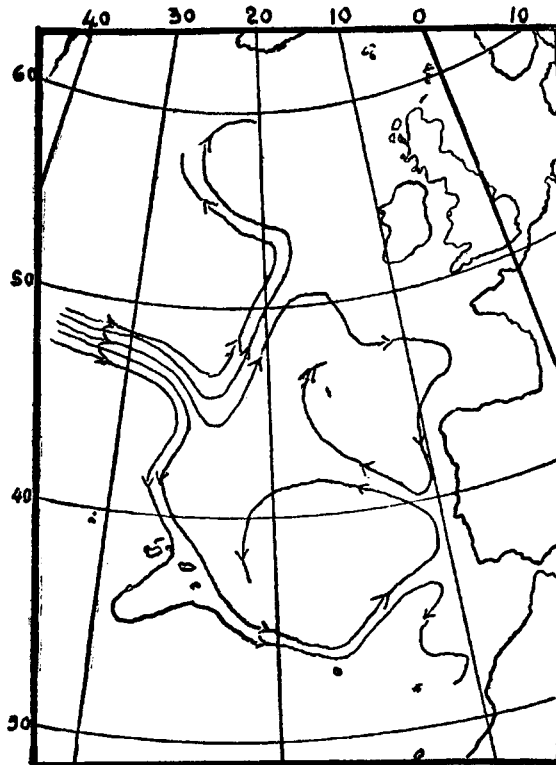


THE GREAT NORTH ATLANTIC CURRENT.

EXTRACT FROM AN ARTICLE ON THE GEOPHYSICAL INSTITUTE AT BERGEN,
PUBLISHED IN "Nature", JULY 21ST, 1928, BY PROFESSOR D'ARCY W. THOMPSON, C. B., F. R. S.

Recent cruises of the *Armauer Hansen* (*) have added much to our knowledge of the course of the great North Atlantic Current popularly known as the Gulf Stream; and in a recent number of the *Geofysiske Publikasjoner*, HELLAND-HANSEN and FRIDTJOF-NANSEN together have not only described its course and branching, but also have brought these phenomena into line with a beautiful theorem of Prof. WALFRID EKMAN'S. This theorem, published in the *Arkiv für Matematik* about five years ago, is an extension of, or corollary to, the well-known theorems which show how rotation of the earth influences the direction of an ocean current — a matter which one was apt to think had been fully explained. Coming from the westward, the great current reaches mid-Atlantic far to the West of the Bay of Biscay and about half-way between Rockall and the Azores. Here it swerves somewhat abruptly to the southward and presently divides into two branches (*See fig.*); one, turning sharply northward towards the Porcupine



(*) The "Armauer Hansen" is a small vessel of 58 tons which belongs to the Geophysical Institute of Bergen.

and Rockall Channel, passes thence onwards into the Norwegian Sea; while the other and lesser branch continues to bend southwards towards the Azores, and then flows westward with more and more devious windings to Madeira and the Portuguese coast. EKMAN'S dynamical theorem tells us that a current flowing from a shallower to a deeper sea will (in the northern hemisphere) tend to be slewed to the left and *vice versa*; this law holding good even though the depths be very great. Now there is a well-known "Longitudinal Ridge" running North and South, midway through the crooked river-channel of the Atlantic; again, from the Azores to Madeira, the bottom stands somewhat higher than in the basins to the North and South, while between Madeira and Portugal soundings are variable and the topography complicated. Putting two and two together we see (or rather are shown) how the great current bends southward (*i. e.* to the right) just when, and just because, it reaches the comparatively shallow water over the Longitudinal Ridge. Next, that part of the current which is first to cross the Ridge is sharply deflected to the left when (and because) it reaches the deep water on the eastern side, and so it shapes its course northward towards the Porcupine Bank and the seas beyond, while the other and lesser portion of the great current is slewed more and more to the right as it follows the shallow waters towards the Azores. Passing Madeira and approaching the Portuguese Coast, the course of the current becomes extremely complicated; and "it stands to reason" (as our authors say) that it is here closely following, in all its constant twists and turns, the ups and downs of the complicated topography of the bottom.

