# BULLETIN DE L'INSTITUT OCÉANOGRAPHIQUE, PARIS

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The Oceanographic Institute in Paris has forwarded to the International Hydrographic Bureau, numbers 764, 766, 779, 781, 784 and 791 of its Bulletin, and in this connection we would draw special attention to the report by A. ROCHE on *electrical conductivity for the determination aboard ship of the salinity of sea water* (1), to the report by Doctor Jules RICHARD *on a bottle of simple construction for oceanographic research,* and to two notes by Mr. Camille VALLAUX, one on the *atoll formation of Rocas (Brazil),* and the other on *Mediterranean waters.*

The latter, which is the reproduction of a lecture given at the Nice University Section in February 1939, is worthy of particular attention because it gives a very complete and clear summary of all the facts known by us with regard to Mediterranean waters.

In the preface, the author gives historical data concerning oceanographic work effected in this sea, and then deals with the remarkable fact that a comparatively high temperature exists right down to the greatest depths, with however, a minimum between 950 m. and 2,000 m., according to the region. It would appear that this higher temperature in the deepest layers is due to adiabatic heating brought about by the pressure of the higher layers; the degree of heating attained would correspond approximately to that of the deepest layers of the Ocean, which are in direct communication with the inland sea.

In the subsurface depths, between 20 and 80 meters, a thermal oscillation, which may exceed 7°, has been observed and seems to be due to internal submarine waves — a kind of meteorological resonance.

Evaporation plays a role of primordial importance, as it maintains a high degree of salinity and a decrease in the volume of water, which must be compensated by a penetration on the surface of the Atlantic waters through the Straits of Gibraltar. At the same time a more rapid but less voluminous counter-current is established near the bottom of these Straits.

The surface current which flows from West to East is deviated to the right by the Coriolis force and often tends towards the coast, particularly towards the Algerian coast; however, meteorological depressions will also tend to give this current a cyclonic rotation in various parts of the sea.

The Mediterranean waters being denser and warmer than those of the Atlantic, will gradually sink into the latter and are found along the coast of Portugal at a depth of about 2,000 meters, where they have been deflected by the Coriolis force. However, owing to their relatively small volume, they cannot long maintain their individuality and they can barely be detected as far as the Irish coast.

The waters of the Black Sea differ distinctly from those of the Mediterranean, with which they communicate through narrow channels only. Their density and salinity is low, their evaporation relatively inactive; a current, therefore, flows from the Black Sea towards the Mediterranean.

In the deep waters of the Black Sea, the dissolved oxygen is replaced by sulphurated hydrogen and these waters seem to form a practically motionless mass, whereas the surface circulation resolves itself into two or even three cyclonic eddies.

P. V.

(1) *See, with regard to this subject, Hydrographic Review,* Vol. VIII, N° 1, May 1931, page 265.