

KUROSHIO UND GOLFSTROM

by

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This new publication of the *Institut für Meereskunde* undertakes a study of the two great currents, so frequently compared, in the Atlantic and the Pacific Oceans. This new comparison is based on six corresponding transverse profiles of the Kuroshio and the Gulf Stream.

In a few pages the author presents an historical summary of the discovery and study of the Kuroshio since the time that Captain KING, the companion of COOK, first revealed its existence to Europe in the year 1784. He cites the explorers who made the first scientific observations and the oceanographers who have sought for its explanation and mapped its course, concluding with notes on the numerous recent works of the Japanese on this subject. At the same time he furnishes a very complete bibliography.

Chapter II treats of the quantities of water, the heat-units and salt transported on the surface by these two currents. This is shown on the charts representing the curves of equal anomalies of surface temperature for February and August and the differences in temperature between water and air in the North Pacific. From this one is readily convinced of the greater importance of the thermal action of the Gulf Stream, especially in winter. It is further apparent that for the Kuroshio in particular, we are concerned with currents of permanent gradient which are but slightly influenced by the variable currents due to the wind. On the basis of these conclusions the author makes a distinction between the following five sections in the Kuroshio system :

- 1) The Kuroshio proper in the Riu Kiu ravine.
- 2) The Kuroshio in the open sea (from the eastern Boso peninsula to the meridian 170° East).
- 3) The current of the North Pacific (as far as about the meridian 150° W.).
- 4) The western branches — the Tshushima current in the Sea of Japan and the summer branch in the Yellow Sea.
- 5) The eastern branches, that is, the eddy and the counter currents at the eastern limit of Kuroshio proper.

Chapter III continues the study of these same questions for the deep waters based on the series of observations of the "Mansyû" in 1925 to 1927 in the Pacific, of the "Bache" in 1914 and the "Atlantis" in 1932 in the Atlantic and by means of calculations of the dynamic action in accordance with the methods of Bjerknes, Sandström and Helland-Hansen. Distinction is made between the various layers of water by their salinities and temperatures, according to the variable depth of the layer of zero velocity, and the velocity profiles, the results of which abreast the Bahamas are in close agreement with the direct observations obtained from anchored vessels.

In the Pacific, the comparison can only be made between the velocities of currents deduced from observations made from drifting vessels (Mansyû); this is, however, sufficiently satisfactory.

The final pages are devoted to a comparison of the quantities of water, of heat and salt transported by the two currents — quantities which in all three cases are to the advantage of the Gulf Stream.

The interesting results of this study prove that in spite of the relatively small number of observations utilized, the methods which have been used to deduce the movements of the liquid masses produce results which are comparable and values which, to the first approximation, may frequently be considered as absolute.

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