

## OCEANOGRAPHY AND THE NAVY

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In the *U. S Naval Institute Proceedings*, Annapolis, Md., January 1934, Commander C. C. SLAYTON writes under the above title an article depicting the relations between oceanography and the Navy, and in it he emphasises the extent to which it is of interest both to the mariner and to science that the Navy should collaborate in certain works of physical oceanography.

In the early days of oceanographic expeditions, the ships of the various navies co-operated very largely, but in recent years it would seem that the Navy has lagged behind, just when more accurate methods and instruments are opening up fields of much wider possibilities. Instruments such as the Echo Sounder, recording thermometers and water-sample bottles as well as other appliances used in dynamic oceanography require specially equipped vessels and trained crews. The Navy has both ships and men which might from time to time be made available to the science of oceanography without detriment to other activities and, on the other hand, the Navy is particularly interested in the development of this science, more especially as regards information concerning currents and bathymetry.

The dynamic method for the prediction of currents necessitates physical measurements which, in certain little-frequented areas, can only be made by Navy vessels. Certain surveying ships of the U. S. Navy already carry a complete installation fitted for oceanographic research work, reversing water-sample bottles, deep-sea reversing thermometers, which allow of all the operations involved in dynamic sounding.

During the 1932-33 season the U. S. S. *Hannibal* occupied 150 stations for sounding of this nature in the neighbourhood of the Gulf of Panama, and the same kind of work was carried out by the patrol ship *General Greene* off the Newfoundland Grand Banks.

Water samples may be kept for laboratory analyses, but it is possible also to determine salinity on board ship, by titration. Besides, all these elements are indispensable for obtaining the correct reduction of echo soundings.

The cooperation of the Navy is also necessary in investigations on gravity, terrestrial magnetism and the greater sub-marine deeps or ridges.

It should be noted that the Hydrographic Office, Washington, centralises data collected by ships of the Merchant Service and the contribution of voluntary observers is considerable.

Commander C. C. SLAYTON quotes a passage from a Report drawn up in 1925 by the Commission instructed to draft proposals for the co-operation of the Navy in oceanographic work; the best solution would seem to be the fitting up of a vessel exclusively for such work; this vessel might usefully be a non-magnetic ship and might be maintained by the co-operation of the Navy with different scientific institutions. Another solution might be to instal the necessary minimum of oceanographic instruments on ships making regular crossings; these ships might occupy certain stations during a voyage and afterwards re-occupy them in the course of ulterior crossings. If such ships took one sounding a day, the resulting delay would be barely 2 to 3 hours each time. A third solution consists in assigning to certain vessels, for instance to surveying vessels, oceanographic work to be undertaken along with their regular duties.

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## OBSERVACIONES DE PRECISION CON EL SEXTANTE

by

COUNT DE CAÑETE DEL PINAR

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The Naval Observatory of San Fernando has recently produced a second edition of Count de CAÑETE DEL PINAR's book on the Use of the Sextant for Precise Observations.

The book, originally written in 1895, explains in detail GAUSS's equal altitude method and its application to the determination of latitude. It contains many numerical exam-