

HYDROGRAPHIC OBSERVATIONS IN THE JAVA SEA, MADE IN THE YEARS 1914, 1915, 1916 AND 1919

BY

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In the months of February and May 1914, May, August and November 1915, and February and May 1916, cruises were made in the Java Sea in the exploration craft "Brak" for the purpose of studying the salinity, temperatures and the currents in the different water layers. On five out of these seven cruises, and furthermore on special fishing expeditions, the Chief of the Laboratory for Marine Investigations at Batavia, Dr. A. L. J. SUNIER, collected a great number of plankton samples and other biological materials. Moreover, after June 1919 Dr. H. C. DELSMAN, Zoölogical Assistant at the said laboratory made a number of cruises along the North coast of Java and Madura to collect pelagic fish eggs and larvae.

During the elaboration of the plankton samples the wish arose to have the hydrographic data together in a small compass, in connection with the occurrence and the finding places of the biological materials. The hydrographic data are arranged in the following tables, separately for the seasons; the same were elaborated with respect to salinity and surface temperature on the subjoined little charts. The observations in February and May 1914 and in May and August 1915 were taken by the present writer, the remaining ones are the work of his temporary successor as commander of the exploration craft, Mr. P. E. VAN KOESVELD.

The salinities were derived, by means of the KNUDSEN tables, by gaugings with KÜCHLER areometers (hydrometers). If, generally speaking, no very high demands in the matter of accuracy ought to be made with respect to these weighings, especially in view of the variations that appear in the surface tension of the sea water ¹⁾, special allowance should be made in such a case as ours where the observations had to be carried out on a small mobile ship, by persons whose chief occupation is the navigation of the vessel, and who can devote only such time as remains to the making of experiments. It is desired that the following salinity indices should be regarded from this point of view. However, on comparing the isohalines obtained in this manner with those for the corresponding months of the years 1917 and 1918 when the salinities were determined by the titrimetric method, the general course of those

¹⁾ See NANSEN, F. „The Oceanography of the North Polar basin. Norwegian Polar expedition 1893-1896; Scientific results, 3, No. 10.”

lines will be found to correspond very closely. The image they produce is, however, only relatively correct, since on a closer comparison it appears that the salinities obtained by means of hydrometers are considerably higher ($0.5^{0}/_{00}$) in all seasons. The KÜCHLER hydrometer employed having broken, it is not now possible to state to what extent this divergence should be regarded as an instrumental error. It may be assumed with some confidence that these too high salinity indices should be chiefly attributed to the vibrations caused by the propeller, by which the surface tension is reduced to a minimum.

The charts appended, together with those for the years '17 and '18 would show, as far as this may be concluded from the still insufficient number of years of observation, that the annual variations as to salinity and temperature for the different seasons, are relatively not great. The various stages of transition from the spring seasonal turn to the S.E. monsoon are brought out very fairly in the charts.

In the deeper layers the temperatures were determined by means of reversible thermometers. Capt. VAN KOESVELD used those instruments also for determining the surface temperatures in the series determinations. For the remaining surface temperatures the thermometers employed were ordinary ones whose I. C. was known.

The current-measurements were done by means of an Ekman current meter.
