Magnetic observations revealed an anomalous declination zone of 36° to 32° in the region of both islands. Determination of the magnetic elements at various points on the stationary ice, or when drifting slowly, enabled the zone of magnetic observations to be considerably extended. A series of symmetrically placed points was thus obtained, enabling a more accurate chart of the magnetic elements of the unexplored portion of the Kara Sea to be constructed. The great variations in the intensity of the horizontal component of the earth's magnetism account for the considerable perturbations of the variation of the compass. In all, 13 observations were made at 8 stations.

Hydrological observations were made at 105 deep-water stations, two of which were of 48 hours' duration. In the district of shoal depths, i.e. the central and northern parts of the Kara Sea, the temperatures in all the layers of water were very low, approximately 2° lower then those taken in 1932. At the stations north-west of Wiese Island, in a deep depression, warm Atlantic water was detected in a layer of water bounded by the 100 and 300 metre contour lines, penetrating there from the polar basin. The highest temperature of this water was 1.7°. In the *Sedov's* laboratory analyses were made of salinity (1077), oxygen (618), phosphates (619) and alkalinity (680) : in all, 2994 analyses.

The temperature and salinity of the surface layer were determined at 308 points. Two hundred floats were streamed for determining the ice-drift, and the tides at the islands were determined.

These investigations have enabled a dynamic chart of the Kara Sea to be plotted.

With regard to the floating sea ice, it must be said that both in the northern and north-eastern parts of the Kara Sea this year has been a very difficult one. The border of heavy pack-ice, 10 points in thickness, extended along the east coast of Franz Josef Land, eastwards to Novaya Zemlya and running to the southward some 50 or 60 miles from the Kamenev Islands. In the rest of the area, as far as the Arctic Institute Islands, the thickness of the ice was from 6 to 7 points, gradually thinning out towards the south.

Turning to the other kinds of work, the nature of the sea bottom was investigated. One hundred and seventeen monolithic fragments were recovered from the bottom and 120 other samples. Further, valuable material was collected on the distribution of boulders, pebbles and rubble at 50 points of the sea. The deepest parts of the sea are covered with a brown ooze of considerable thickness. As the Taimyr Peninsula is approached, the thickness of the brown ooze decreases greatly to give place to a greyish-green and green ooze.

Simultaneously with the observations on the ice sheet, the physical properties of the latter were studied, particularly its mechanical resistance, the salinity distribution (by the method of determining its electric conductivity) and the hard particles (by the method of photometric measurement by means of photo-elements). Altogether 938 determinations were made.

The cruise lasted in all 75 days; the distance covered during this time was 5,000 miles, of which 3,500 were entirely on the ice.

The icebreaker *Sedov* rescued the surveying ship *Tsirkul*, which was caught in the ice and which was extricated with great difficulty.

On 2nd October the *Sedov* returned to Archangel.

DAS OZEANOGRAPHISCHE BEOBACHTUNGSMATERIAL (SERIENMESSUNGEN) DES METEOR.

(RESULTS OF THE OCEANOGRAPHIC SERIAL OBSERVATIONS OF THE "METEOR")

collected and arranged by

DR. GEORG WÜST.

Vol. IV, Part II, published by Walter DE GRUYTER & Co., Berlin and Leipzig, 1932. Price 39 Rm. ; bound, 43 Rm.

The publication of the observations of the German Atlantic Expedition in the *Meteor* continues; the International Hydrographic Bureau has received the second part of the fourth volume; it contains the results of the oceanographic serial observations made by the oceanographers of the expedition. The first part of the fourth volume described the

instruments and methods of reduction and analysis. It was by employing these methods that Dr. Georg Wüst obtained and collected the final values which he presents in the tables corresponding to each station.

Each table includes the date, geographical position, mean depth of the sea bottom at the station, zone times, gross depth (*solltiefe*) and true observed depth. The gross depth depends solely on the reading of the length of wire paid out, the second is deduced directly (to an accuracy of $\pm$ 1 m.) or by interpolation (to an accuracy of $\pm$ 5 m.) from observations with protected and unprotected thermometers. The tables also contain the numbers of the thermometers used, and the temperatures (corrected by the protected thermometers) to two or three decimals. When two thermometers were used simultaneously, the mean of the results is given as well as the difference Δt° between each result and this mean. A comparison of these various values shows that the mean precision obtained with two thermometers reading to a tenth of a degree was $\pm$ 0.01°.

One of the three last columns of the table gives the percentage of chlorine content to three decimals, the error of an observation being generally below 0.005. This content was found by titration carried out on board, allowing also for a control titration carried out at the Institut für Meereskunde of Berlin only a few months after taking the samples. The latter titrations have seemed to be less accurate than the former; they often show somewhat higher chlorine content — clearly due to the effect of evaporation. It is therefore advisable to carry out titration on board shortly after taking samples, and, in cases where the samples must be kept with a view to a later analysis, to cover the stoppers of the flasks immediately with paraffin. It was also possible to check the titration and detect erratic results by constructing, for certain stations, the curve which connects the temperature with the chlorine content.

The penultimate column gives, to two or three decimals, the value of the salinity deduced from the chlorine content, not by means of Knudsen's tables, but by means of new manuscript tables calculated with Knudsen's formula.

The last column gives the density *in situ* to two or three decimals, deduced from the foregoing data by means of manuscript tables calculated for this expedition by Dr. A. Schumacher.

A third part collects these data in a form more convenient for making use of them. It gives the salinities and densities *in situ* for all the stations and for the usual round-number depths. These values were deduced from curves showing the values of the various data on a vertical.

We thus have here the whole of the results of physical oceanography observations from the *Meteor* cruise, corrected and discussed with great care and competence; further, they are presented in a very convenient manner for making use of them.

P.V.

GEODETIC SURVEYS IN THE U. S. A.

(Extract from *Nature*, London, 6th April 1935, p. 559).

The Proceedings of the National Academy of Sciences, Washington, D.C., No. 21, 1-68, Jan. 15, 1935, contain an interesting article by Mr. William Bowie entitled *Fundamental Geodetic Surveys in the United States nearing completion.*

The U.S. Coast and Geodetic Survey is now completing a series of first-order arcs of triangulation and lines of levels spaced at intervals of about 100 miles, with second-order triangulation and levelling in the intermediate areas. It has been found that mean sea-level along the coast is not an equipotential surface, but increases with increase in latitude. The Canadian and Mexican governments have unified their triangulation systems with that of the United States, so a single triangulation net is available for the whole of North America.
