Die Veränderungen während der einzelnen Jahre und Monate werden in einem letzten Abschnitt an Hand von Diagrammen für verschiedene Stationen besprochen. Es wäre zu wünschen, dass die Untersuchungen weitergeführt werden, damit man später, was jetzt noch nicht möglich ist, ein genaueres Bild über die hydrographischen Verhältnisse und ihren Wechsel im Laufe der Jahreszeiten und Jahre erhält. G. B.

Sir F. STUPART, J. PATTERSON, and H. G. SMITH. Ocean Surface-Water Temperatures — Methods of Measuring and Preliminary Results. Bull. Nat. Research Council. No. 68. Washington, D. C., 1929. pp. 76—88.

Some ten years ago the Canadian Meteorological Service took steps to organise the collection of surface-water temperatures at sea, to provide material for the study of the weather in North America. In common with others who have made similar attempts, they encountered the difficulty that the usual methods employed on board ship for observing the water temperature do not, as a rule, supply data as accurate as desirable for scientific purposes. These obstacles need not be mentioned here in detail, as the subject has been extensively treated by Dr. C. .F. BROOKS (and others), two of whose papers have already been noticed in this Journal[1]). Efforts to obtain more reliable observations led to the adoption of methods which are novel in their application to this class of work, and which shew the authors to have enjoyed an enviable freedom from precedent. They state that the first essential seemed to be that the thermometer should be constantly maintained at sea temperature: this could best be done by immersion in a well. The most convenient position for such a well would be in the condenser intake pipe, close to the ship's side, in the engine room. Though fully aware of the possibility of differences between the temperature of the uppermost 6 or 8 inches of water and that of the water 20 or 30 feet below, this position was finally adopted. This matter also has been studied by Dr. BROOKS, who found justification for the use of measurements at condenser intake level as "surface" observations; it seems to be the authors' opinion, however, that the point needs some further attention.

Tests were made with two types of instrument, — the resistance-thermometer and the distance-thermograph. The former type, which was the first tried, did not give full satisfaction, as it was difficult to keep the instruments in order under the conditions of use. One such instrument was placed in an insulated box against the ship's side in the engine room and was compared with another fitted in the condenser intake pipe. There was evidence, however, that the one against the ship's side was affected by the temperature of the engine room.

The second type, the distance-thermograph, was, in spite of certain initial disadvantages, so much superior to the other type that it became the one permanently employed. The disadvantage referred to was the shortness of the life of the steel bulb, the copper plating with which it was coated being insufficient to prevent destruction of the bulb by electro-

[1]) Journ. du Conseil, III, 3, 1928, pp. 385—8, and IV, 2, 1929, pp. 236—8.

lytic action. This trouble was eventually overcome by fitting the bulb into a copper well, screwed into the condenser intake pipe and suitably packed.

The instrument finally chosen was of the mercury-in-steel type, with a wall-type recorder, which was placed so that the capillary used was about 10 to 15 feet in length. The record could be read to 0.2° F. (ca. 0.1° C.), and the range was from 30° to 90° F. (ca. —1° to 32° C.). In most cases weekly charts are used, but daily ones are substituted when the temperature fluctuations are likely to be large or sudden. It is not stated what methods are employed to check the instruments, and the accuracy of the records obtained is not discussed.

Instruments of this type have been installed during the past 5 years or so in various ships of the Canadian Service in both the Pacific and Atlantic Oceans. A considerable material has already been collected in the Pacific, but the Atlantic observations on the route from Montreal to the West Indies, — designed to trace variations in the boundary of the Gulf Stream, — are yet few.

After the description of instruments, the paper consists of a study of the data so far obtained, especially in regard to their relation with North American climatic conditions, — a subject rather outside the province of this Journal. The brief, but most interesting, discussion of variations in ocean temperature as cause or effect of similar variations in the atmosphere must nevertheless be referred to. J. R. L.

H. THORADE. Gezeitenuntersuchungen in der Deutschen Bucht der Nordsee. Nach Beobachtungen des Vermessungsschiffes "Panther" im Juni 1924. (Aus dem Archiv der Deutschen Seewarte, 46. Band, Nr. 3. 1928.)

Im Jahre 1924 wurde von der Deutschen Seewarte eine Untersuchung über die Gezeiten der Sylter Gewässer (A. d. Arch. d. D. Seew., 41. B. Nr. 2) als erster Teil einer grösseren geplanten Arbeit zur Erforschung der Gezeiten der Nordsee herausgegeben. Die vorliegende Arbeit bildet den zweiten Teil dieser Untersuchung. Es wird über Strommessungen an Bord des Vermessungsschiffes "Panther" während der Zeit 12. Juni—1. Juli 1924 berichtet. Die Messungen wurden teils für methodische Untersuchungen zur Strommessung, teils für örtliche Untersuchungen der Gezeiten ausgeführt. In die erste Gruppe gehören Untersuchungen zum Vergleich der Strommesser von EKMAN-MERZ und von JACOBSEN und zur Prüfung ihrer Zuverlässigkeit, sowie Untersuchungen über die Störung der Strombeobachtungen durch das Schiff. Aus den Ergebnissen dieser Untersuchungen sei Folgendes hervorgehoben: Bei dem Strommesser von EKMAN-MERZ waren die Geschwindigkeitsangaben einwandfrei, aber die Richtungsangaben waren durch die Deviation der Kompassnadel infolge der Eisenteile des Schiffes beeinflusst. Es zeigte sich, dass sogar in 30 m Tiefe beim "Panther" (Kompositschiff aus Eisen und Holz) Deviationen von über 20° vorkamen. Bei dem Strommesser von JACOBSEN waren die Richtungsangaben zuverlässig aber die Geschwindigkeitsangaben nicht genau genug. Bei den folgenden Messungen wurde deshalb die Richtung mit einem Libellenstrommesser von JACOBSEN und die Geschwindigkeit mit einem