a continuation of this ridge. It proceeds from Cape Reykjanaes, the south-western point of the peninsula, on which the effect of subterranean fire is seen everywhere; hot springs, solfataras and mud-volcanoes are found everywhere, and it is probably in case of these safety valves not being adequate that such catastrophes take place, as the one that caused so much damage to Iceland in 1896.

The ridge called *Reykjanaes-Ryg* must be of volcanic origin, and it will be seen from the aforesaid reports from ships that the volcanic forces here also are in constant activity. The ridge from a geological point of view is of later origin; it was formed after the glacial period; this inference may be drawn from the fact that the trawl — at all the drags on the said ridge — did not meet a single rock; not one mesh in the trawl was broken, while, on the other hand, both to the eastward and westward of the ridge, the bottom was strewn with stones, by which the trawl was torn asunder. The proof of the existence of this ridge still further corroborates the conception that *Busse Island* existed, and disappeared by volcanic eruptions (1).

The soundings taken in Denmark Strait and Davis Strait have not modified our knowledge of the depths in these seas in any way.

Soundings were taken as soon as the vessel was inside the 100-fathom curve, both off Greenland and off Iceland. The vessel was supplied with two sounding machines (William THOMSON's) with which — if the depth be not too great — soundings may be taken even if the vessel be sailing at 12-14 knots. With a speed of 8 knots, the normal speed for the *Ingolf*, soundings could be taken with facility in 120 fathoms of water. Instead of THOMSON's tubes the RUNG bathometer was used.

In Davis Strait valuable soundings were taken to determine the position of the banks lying along the west coast, of which it is of great importance to have correct knowledge when making the land.

In Icelandic waters there is still a great deal to be done with respect to surveying of the shoals, and soundings were taken whenever there was an apportunity to do so, and we succeeded in gathering a considerable amount of material of interest for navigation as well as for fishing.

The whole of the work mentioned here has been delivered to the Hydrographic Office to be entered in the charts of the respective seas.

HYDROGRAPHIC DATA.

by

GILBERT T. RUDE

(Extract from a paper read before the Geological Society of America in June, 1933, published in the *Bulletin of the Geological Society of America*, New York, June, 1933.)

In the course of this paper, Captain RUDE directs attention to the economic importance for a country to possess accurate hydrographic surveys of its coasts. By means of comparisons made between surveys dating back to the middle of the last century and the most recent surveys of certain coasts of the United States, the writer shows that the data collated during a survey must be submitted to a severe analysis with respect to their precision. An idea of the manner in which a survey has been carried out may be gathered when attempting to draw the depth contours from the system of soundings. The influence of the spacing of the sounding lines on the original sounding sheet, and that of the intensity of the soundings commensurate with the depth of the water, as well as with the character of the bottom, will thus be ascertained. Attention must also

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(1) *Detailed information is given on the question of* Busse Island *in Volume I, pages* 164-202, *of the account of the Danish Arctic Expeditions in* 1605-1620, *published by the Hakluyt Society in* 1897.

be especially given to the accuracy with which the position of the sounding has been determined. It should be borne in mind that a sounding is three-dimensional; in other words, it is of actual value as a vertical measurement with respect to the ocean bed only if the accurate geographical position of such sounding can reasonably be relied upon. Modern science presents great resources and numerous methods to help the hydrographer in the art of drawing up surveys. The geologist, on the other hand, should accept for his physiographic studies only data obtained by applying modern methods and scientific technique. Modern hydrographic surveys present a fairly high scientific aspect, and the geologist should accept with the greatest circumspection those data which are not based on these modern principles and which do not answer necessities corresponding to the possibilities offered by science.

DEEP SEA DIVES WITH THE BATHYSPHERE.

(Extract from the *Bulletin of the New York Zoological Society*, Nov.-Dec. 1934, and *The National Geographic Magazine*, Washington, Dec. 1934).

Dr. William BEEBE's deep sea dives with the Bathysphere have already been mentioned in *The Hydrographic Review*, Vol. VIII, No. 1, May 1931, page 245.

During 1934, the oceanographic work undertaken by the New York Zoological Society was resumed at Nonsuch, Bermuda, and the opportunity occurred to perform a series of dives down to 3028 feet with the Bathysphere, which has been much improved within the last few years. During a noteworthy dive, which lasted three hours, the occupants were able to note some extremely interesting data concerning fish in the very heart of their element. A report on the various dives effected and the results obtained has been published by the New York Zoological Society in its November-December 1934 Bulletin, as also in an article by Dr. William BEEBE in the December 1934 issue of *The National Geographic Magazine*, which includes a particularly striking series of coloured photographs relative to the dives.

GREAT SEA WAVES.

by

LIEUTENANT-COMMANDER R. P. WHITEMARSH, U. S. NAVY.

(Extract from the *United States Naval Institute Proceedings*, Menasha, Wisconsin, August 1934. p. 1097).

The fascinating study of sea conditions, in great vogue over fifty years ago, has, with the advent of steam and its detracting activities, come into a measure of neglect. It is significant that authorities of to-day in their treatment of the sea find it necessary to refer to theories developed in 1888, 1890, 1900, and 1904 for their latest data. Some of the best work was accomplished by the German scientists von HELMHOLTZ, BORGEN, and ZIMMERMANN many years ago in studies of the North Sea.

The extreme height of storm waves is one phase of the subject on which there is no evident agreement. Waves of seismical origin are not considered in this discussion, except that one may serve as an example of a wave of extreme height. In August, 1883, there was an earthquake central near the Island of Krakatoa, Sunda Strait. One of the resulting seismical waves measured 135 feet (41.1 m.) in height, which figure is generally accepted because of the thorough investigation which followed.