

AN OBSERVATION OF "BALL ICE"

A PECULIAR type of ice formation of which no description has been found in the more easily accessible literature was observed in Antarctic waters (66° S., 152° E.) on 25 February 1948 during the cruise of the *Wyatt Earp* of the Australian National Antarctic Research Expedition. The temperature of the water surface was 29° F. (-1.7° C.), that of the air 25° F. (-3.9° C.), wind Beaufort 2. As shown in the photograph (Fig. 5, p. 316) numerous spheres of a diameter of one to two inches (2.5 to 5.0 cm.) were found floating in the sea. The balls were very soft and spongy; no internal structure could be clearly distinguished. They were generally arranged in "streams" in the same way as the slush that was simultaneously forming in many places.

The ball ice may possibly have originated from the coalescence of frazil ice particles and their subsequent rounding off by wave action and collision with other particles. Or they may be remnants of small pancakes worn down by the same process. This explanation is suggested by the association of the balls with slush and incipient pancake ice, but it appears nevertheless unlikely because no transition between the flat pancakes and the balls was observed. Another explanation is that snowflakes, which fell into the water, did not melt but were able to continue floating at the surface. The movement of the water brought them into contact with each other so that they stuck together, the agglomerate becoming rounded by water movements and the impact of other solid particles. This second explanation becomes more likely as snowflakes had actually been falling for some time before the observation. It would be interesting to know whether similar "ball ice" has been observed elsewhere and whether a more likely theory of its formation can be suggested.

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REVIEWS

THE COAST OF NORTHEAST GREENLAND. LOUISE A. BOYD. New York: American Geographical Society, Special Publication No. 30, 1948. Section on Studies in Glacial Geology and Geomorphology (1937) by Richard F. Flint, p. 91-210.

THE 1937 and 1938 expeditions of Miss Louise A. Boyd carried a group of scientists to the northeast coast of Greenland, with brief stops at Jan Mayen and Spitsbergen. Professor R. F. Flint of Yale University accompanied the 1937 expedition as geologist; Dr. A. Lincoln Washburn, now Director of the Arctic Institute of North America, was assistant geologist.

Publication of the results of these expeditions, withheld during the war years, forms a significant contribution to the knowledge of Greenland and complements the reports of Miss Boyd's two earlier expeditions.* Geologists and geographers alike will find that the present volume with its excellent illustrations and maps will add greatly to their fund of information on this relatively inaccessible region.

As geologist for the 1937 expedition, Professor Flint was primarily concerned with four objectives: (1) erosion and deposition by existing glaciers and their more extensive predecessors, (2) rate and character of deglaciation within the recent geologic past, (3) crustal uplift and changes of sea-level as related to deglaciation, and (4) major and minor geomorphic features of the fiord region.

* Fjords of East Greenland. *Geographical Review*, Vol. 22, 1932, p. 529-61. The Fiord Region of East Greenland. *American Geographical Society, Special Publication No. 18, 1935.*