During the short time spent in the neighbourhood of the ice pack, Mr. Buchanan made a number of experiments principally with the view of deciding the question whether sea water ice is or is not a mixture of pure fresh ice with brine. The experiments consisted in determining the temperature at which sea water ice melted, and the amount of chlorine contained in the water so formed.

The ice made by freezing sea water in a bucket was found to have formed all round the bottom and sides of the bucket, forming a pellicle on the surface, from which and from the sides and bottom the ice had formed in hexagonal planes, projecting edgewise into the water. The water was poured off, the crystals collected, washed with distilled water, pressed between filtering-paper, and one portion melted. It measured 9 c.c., and required for the precipitation of its chlorine 4 c.c. silver solution, corresponding to 0·0142 gramme chlorine, or 1·5780 gramme per litre. The other portion was used for determining the melting point. The instrument used was one of Geissler's *normal* thermometers, divided into tenths of a degree Centigrade, the zero of which had been verified the day before in melting snow. The melting point of the ice crystals was found to be 29°·7 (−1°·3 C.). The temperature of the melting mass was observed to remain constant for twenty minutes, after which no further observations were made.

In the same way the melting point of the pack ice was determined. The fresh ice began to melt at 30°·2 (−1° C.); after twenty minutes the thermometer had risen to 30°·4 (−0°·9 C.), and two hours and a half afterwards it stood at 31°·5 (−0°·3 C.), having remained constant for about an hour at 31°·3 (−0°·4 C.). The temperature of another portion of the ice rose more rapidly, and when three-fourths of the ice was melted the thermometer stood at 32° (0° C.).

The piece of pack ice examined was clear, with many air-bells, most of them rather irregularly shaped. Two portions of this ice were allowed to melt at the temperature of the laboratory, which ranged from 35° to 45°. The melting thus took place very slowly, and made it possible to examine the water fractionally. The experiments consisted in determining the chlorine in the water by means of tenth-normal nitrate of silver solution, and observing the temperature of the ice when melting.

A lump which, when melted, was found to measure 625 c.c., was allowed to melt gradually in a porcelain dish. When about 100 c.c. had melted, 50 c.c. were taken for the determination of the chlorine; they required 13·6 c.c. silver solution, corresponding to 0·0483 gramme chlorine. When 560 c.c. had melted, 50 c.c. were titrated, and required 1·6 c.c. silver solution, corresponding to 0·0057 gramme chlorine. The remainder (65 c.c.) of the ice was then melted and 60 c.c. titrated; they required 0·39 c.c. silver solution, corresponding to 0·0014 gramme chlorine. There were then in the first 50 c.c. 0·0483 gramme chlorine, in the next 510 c.c. 0·0579 gramme, and in the last 65 c.c. 0·0015 gramme. Hence the whole lump (625 c.c.) contained 0·1077 gramme chlorine, or, on an average, 0·1723 gramme chlorine per litre. A