

Heredity. By J. Arthur Thomson. Second edition. Pp. xvi+627. (London: John Murray, 1912.) Price 9s. net.

In the present edition of his book, the original edition of which was reviewed in *NATURE* for August 20, 1908 (vol. lxxviii., p. 361), Prof. Thomson has included references to some of the new discoveries that have been made in the last five years in the branch of biology with which the volume is concerned.

An Elementary Historical Geography of the British Isles. By M. S. Elliott. Pp. x+172. (London: A. and C. Black, 1913.) Price 1s. 6d.

This little book shows very convincingly how profoundly the geography of a country can influence its history; and it serves to demonstrate also the

LETTERS TO THE EDITOR.

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Iceberg Melting.

I HAVE pleasure in sending you a photograph of the iceberg around which we obtained the isothermal lines published in *NATURE* of December 12, 1912. I did not make an instrumental survey of this berg, but it was larger than the average of those met with in the Strait of Belle Isle. We sighted more than 200 bergs during our trip, and made traces of many of them. Invariably the temperature rose on the approach to a berg. Sometimes a small fall of temperature resulted abeam of the berg, but the rise of

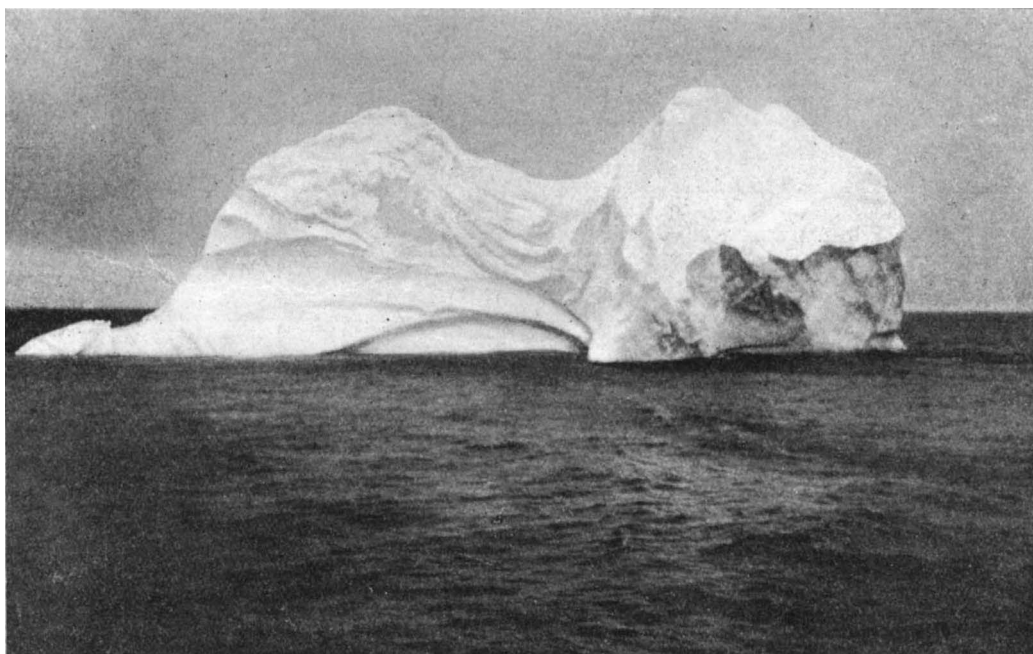


FIG. 1.—Iceberg used for the purpose of studying the isothermal lines published in the issue of *NATURE* for December 12, 1912.

necessity of a good knowledge of geography for teachers of history. The volume may be recommended as suitable for supplementary reading for boys and girls in secondary schools who are studying history or geography. The book is well illustrated and contains numerous helpful maps.

The Interpretation of Radium. By F. Soddy. Third edition. Pp. xvi+284. (London: John Murray, 1912.) Price 6s. net.

THE general characters of this work were given in the review of the first edition which appeared in the issue of *NATURE* of May 27, 1909 (vol. lxxx., p. 368). In the present issue Mr. Soddy has included the latest and most complete data available, and those new discoveries for which there is trustworthy evidence. A new final chapter upon the thorium and actinium series has been added.

temperature was the one characteristic effect. The two other photographs [not reproduced] I send you illustrate the fantastic shapes seen in ice. I wish it were possible to furnish in some way an idea of the wonderful colouring, but I am totally unable to do so.

In the "swimming moose" you can see the dangerous overhanging ridge, which is caused by the under-water melting and the lapping of the warmer water waves against the ice. This ridge is always found in bergs which have not recently turned over. In the records which Mr. King was able to get for me in 1910, besides the rise of temperature, a fall of temperature was obtained, when the ship approached the various icebergs, with the exception of one. These bergs were all floating in the main arctic current off the eastern coast of Labrador. In the light of my recent work I feel sure that the drop in temperature was due to the influence of the cold current in which the iceberg was floating. These cold currents exist in the main arctic current, whether ice is present or not, but the effect of the presence of the ice is to elevate the temperature slightly.

To assist in illustration of my meaning reference must be made to the microthermogram taken on the Allan Line R.M.S. *Victorian* last June. This record, which is a direct trace from the chart on the instrument, is through the ice track at a depth of 18 ft. by the Cape Race route. After passing the "Cold Wall" the arctic current drops in temperature regularly as the ship proceeds westward. The small variations up and down are partly due to icebergs passed at distances of six to eight miles, and partly due to colder currents. The lowest temperature recorded here was reached nearest the Newfoundland coast, but the effect of ice can be seen well marked by the sharp peak of temperature, which I have shaded. Just here we

proach it. I have many other traces illustrating the same thing, and for this reason I was forced to abandon the idea that an iceberg sensibly cools the water in which it is floating. I was also unable to find by calculation that an iceberg could appreciably influence the sea-water on account of its slow rate of melting.

It is very illusive to depend on laboratory tank experiments to illustrate sea-water circulation: the conditions at sea are very different. I was very much surprised not to find, during my experiments last summer, more conclusive evidence of sea-water dilution due to the melting icebergs. A large number of conductivity tests were made of sea-water, and these

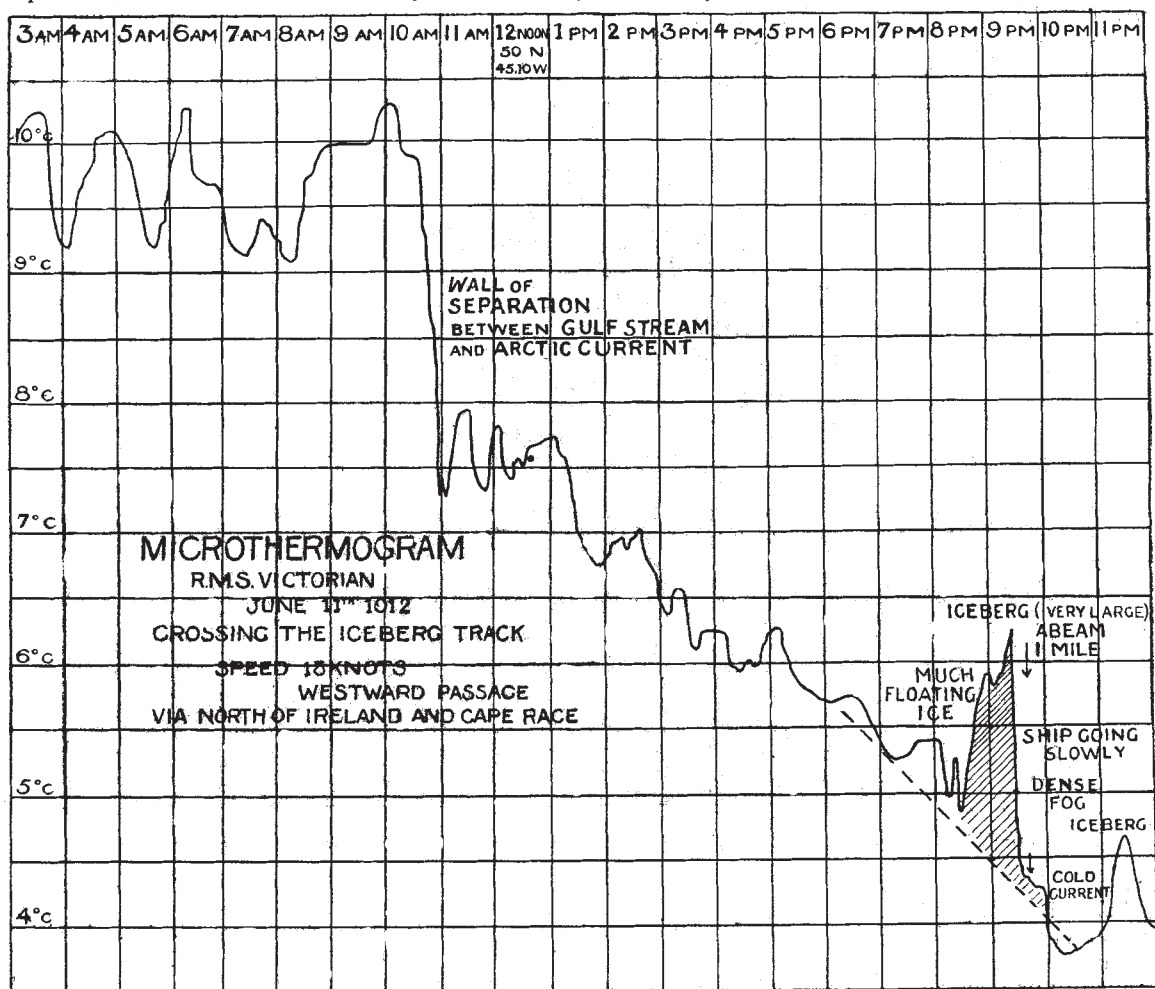


FIG. 2.

passed most of the ice closely, and were obliged to proceed slowly in heavy fog at times. This colder and swifter arctic current carried with it the greater proportion of the ice, but it is well known that this colder current exists whether accompanied by ice or not.

The great drop in temperature just before coming abeam of our largest berg was not due to the iceberg itself, but to the influence of the cold current. The effect of the ice is to hold the temperature abnormally high. The dotted line on the diagram represents how the temperature would probably have gone had no ice been present.

It would depend which way we approached this berg whether a drop in temperature would result. The temperature rises rapidly, whichever way we ap-

proach it. I have many other traces illustrating the same thing, and for this reason I was forced to abandon the idea that an iceberg sensibly cools the water in which it is floating. I was also unable to find by calculation that an iceberg could appreciably influence the sea-water on account of its slow rate of melting.

Table of Conductivities of Sea-water taken in July (1912).

Close to grounded berg, Cape Bauld Neld	0.05007
Strait of Belle Isle, eastern end	0.04827
Ten miles east of Belle Isle	0.04850
Close abeam large berg...	0.04787
One mile north of same berg	0.04806
Close abeam same berg	0.04827
Six miles from same berg	0.04768
Seventy yards to leeward of a berg	0.04787
Forty yards to windward of same berg	0.04787
One hundred yards to leeward of a berg	0.04806

The numbers may perhaps indicate a slight effect, but nothing like what I expected. My conductivity tests of the sea-water brought back by Mr. King from Hudson's Strait in 1910 gave a value of 0.0480 at 25° C. Correcting for temperature this observation serves to connect the sea-water entering the Strait of Belle Isle with that in Hudson's Strait. Eastward from Belle Isle Strait the conductivity rises rapidly for 180 miles, after which it becomes uniform up to 450 miles. The greatest arctic current sweeps down close to the Labrador shore, and in through the Strait of Belle Isle, where the resultant flow is westward. The following measurements of the conductivity through the ice track by the Belle Isle route were obtained last October on the *Empress of Britain*. The values were all measured at a uniform temperature of 25° C.

Abeam of Belle Isle	0.04865
Forty miles east of Belle Isle	0.04986
Eighty miles east of Belle Isle	0.05047
One hundred and sixty miles	0.05150
Two hundred miles	0.05235
Two hundred and sixty miles	0.05257
Four hundred miles	0.05211
Four hundred and fifty	0.05257

It is evident that the great arctic current is of a lower order of salinity, and that its course may be traced along our eastern coast.

In the early spring when the water is cold the Newfoundland fishermen will find the cod in the vicinity of the icebergs, and will always obtain their catch there. Perhaps this is an indication of the warming influence of the bergs, for the cod will not live in very cold water.

Next summer I shall continue my observations more particularly with reference to the influence of land on the temperature of the sea. I hope before long to be able to publish here some typical microthermograms showing this effect.

H. T. BARNES.

McGill University, January 27.

Atmospheric Potential.

UNDER the above heading Mr. Evan McLennan refers in NATURE, February 13, p. 647, to supposed puzzles in atmospheric electricity. That certain difficulties exist no one can deny, but Mr. McLennan's difficulties might, I think, be removed by consultation of existing text-books. The vertical current which he thinks should exist in the atmosphere does exist, and methods of measuring it with more or less accuracy have been in operation for some years. Mr. C. T. R. Wilson devised an apparatus for its direct measurement, and his experiments, made in good weather near ground level, gave a mean value of about 2×10^{-16} amperes per sq. cm. A mean value of the same order, but slightly larger, has been deduced at Potsdam from continuous observations of the electric conductivity of the atmosphere and the potential gradient. To get an electrical current through a vertical conductor it is necessary to bring its upper end to the potential of the surrounding atmosphere. "St. Elmo's fire" is a well-known natural phenomenon. Currents can be obtained through a wire attached to a kite, but the experiment at times may be dangerous. Mr. McLennan seems to suppose that the potential in the free atmosphere increases uniformly with the height. Observations, however, have shown that the normal rate of increase of potential per unit of height diminishes as the height increases and becomes small at the height of a few kilometres. A mountain, it should be remembered, is part of the earth, and shares its potential; if steep it has a large

effect on the shape of the equipotential surfaces in adjacent space. Dr. Simpson, in the letter referred to by Mr. McLennan, mentions the real poser, viz. why in spite of the vertical current the earth retains its negative charge in fine weather.

C. CHREE.

The Ascent of the Italian Balloon "Albatross," August 12, 1909.

IN NATURE of August 19, 1909, a note appeared stating that in an ascent from Turin the Italian balloon *Albatross*, manned by Lieut. Mina and Signor Piacenza, had reached a height of 38,715 ft., which is greater by about 3000 ft. than any authenticated record for a manned balloon ascent. A communication has recently been received from Prof. Palazzo, director of the Italian Meteorological Office, in which he states that the aeronauts Mina and Piacenza were not provided with the necessary instruments for measuring the height which they reached, and that M. Mina, in the *Rivista Tecnica d'Aeronautica* of 1910, modified his earlier estimate and sought to prove that the balloon had reached a height of 9240 m. (30,300 ft.). Owing to the absence of a proper record of pressure and temperature, however, even that value is uncertain.

W. N. SHAW.

Meteorological Office, South Kensington,
London, S.W., February 12.

Induced Cell-reproduction in the Protozoa.

THE discovery of the fact that the products of cell death can cause cell-division in lymphocytes and other cells of the human body has given rise to a strong suspicion that these substances may be necessary for any form of cell-reproduction to occur. It has been already demonstrated by Fantham and Ross that *Amoeba coli* can be caused to divide through many generations by means of auxetics, and Drs. Ross and Cropper have shown that induced cell-reproduction will occur in the ova of *Ascaris megalocephala* if the eggs are mixed with a solution containing auxetics and incubated. It is important, therefore, for confirmation to come from other sources. Some time ago I was fortunate enough to discover a new variety of *Polytoma*, differing considerably from *P. uvella* in many respects, but chiefly in the fact that the new variety formed spores in the late autumn, which did not develop until the following spring. A full account of the new organism is in course of preparation for publication.

These winter resting spores seemed to me to be extremely suitable objects for testing the action of auxetics. Some preliminary experiments were accordingly made to see whether increase of temperature would cause development. Spores were placed under suitable conditions in the incubator, and kept at a temperature of 25° C. for periods varying from one to three weeks. On careful examination it was found, however, that no change had taken place.

A solution was then prepared containing 2 c.c. of a 4 per cent. solution of theobromine, 0.4 c.c. of a 5 per cent. solution of sodium bicarbonate, and 0.5 c.c. of a 1 per cent. solution of atropine sulphate, and the mixture diluted to 10 c.c. with water. Water containing large quantities of the spores was then mixed with an equal volume of this solution, and the mixture was incubated at 25° C. On examination at the end of forty-eight hours about 5 per cent. of the spores were found to show indications of division, while controls containing no auxetics showed no change. I then worked with a concentrated extract of sheep's suprarenal gland, augmented by the addition of 0.5 c.c. of a 1 per cent. solution of cadaverine