LETTERS TO THE EDITOR.

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Electrical Notation.

THE variety of notations for electrical quantities has become a real difficulty in reading international literature. Up to the end of last century the notation of Maxwell was the standard in Great Britain, and such extensions as became necessary were grafted on it. There is no sign of its dying out among the workers, many of them of fundamental importance, who have been accustomed to employ it—in pure science at any rate.

You direct attention (p. 541) to the conflicting recommendations produced simultaneously by two committees, each carrying authority. As the list which you reproduce on p. 545 claims to have international force, it would be interesting to speculate how many readers could guess what are the quantities proposed to be denoted by the symbols η, f, G. ϵ, X, Z, S, Φ. A German equivalent for f is given as ν, which is usually synonymous with n further up in the table; so that f seems to be a duplicate.

Cambridge, January 15. J. LARMOR.

The Influence of Icebergs on the Temperature of the Sea.

THE part of the "Report on the work carried out by the s.s. *Scotia*, 1913," on the above subject, referred to in NATURE of January 14, will, I fear, be a great disappointment to many after the great promise given by the new line of investigation discovered by Prof. H. T. Barnes, of Montreal University. Prof. Barnes found, by means of a very sensitive registering thermometer, that there was always a rise in temperature of the sea on approaching icebergs, and part of the *Scotia's* work was to check this observation. The *Scotia* was fitted with two sensitive registering thermometers, one to be used for trawling near the surface; the other was placed in a box through which the condenser water for the engine was pumped. Unfortunately, both these instruments soon became defective owing to sea water leaking into them. The one used for surface temperatures was repaired on the voyage, but the other does not seem to have been restored to working condition. The result is that all the temperatures taken with the recording instrument are surface temperatures taken at a depth of 2 ft.

The following is the conclusion come to by the observers on the *Scotia*. "An inspection of the records . . . leads to the conclusion that the temperature of the sea near its surface does not furnish a certain method of detecting the presence of an iceberg in the regions over which the *Scotia* made her voyages." Now Prof. Barnes's conclusion was not arrived at from temperatures taken near the surface, but at some depth. His records of the rising temperature on approaching icebergs were made with his first ship, in which the thermometer was placed at a depth of 5 ft., but better results were obtained by his second ship, in which it was placed at a depth of 16 to 18 ft.

In justification of their conclusion that their surface temperatures ought to give results similar to the deeper ones, the observers on the *Scotia* seem to have accepted Prof. Barnes's explanation of the cause of the rise in temperature near the berg. Prof. Barnes says all the water from the melting ice is carried downwards, and that this downward current is supplied by a surface current flowing towards the berg, and that this surface current, in some way not explained, retains all the solar radiation, which he says usually penetrates deeper, but is, he says, prevented by the water being in motion. If that explanation be correct, then the *Scotia's* observers would be quite right in supposing that the rising temperature would be more manifest at the surface than at some depth. Though the *Scotia's* observers accepted Prof. Barnes's explanation of the heating of the water, they do not seem to be satisfied with it, as they say: "This explanation is difficult and seems complicated."

Prof. Barnes's explanation is founded on the supposition that all the water of the melted ice is carried downwards. Dr. Otto Pettersson, on the other hand, says that only the water of the ice melted some distance below the surface is carried downwards, while that melted near the surface flows away from the berg on the surface. In a previous letter (NATURE, January 9, 1913) I showed by two methods of experimenting that all the water of the melted ice comes to the surface. I think it is generally admitted that the salinity of the sea is, as a rule, lower in the vicinity of melting ice than at a distance from it. If so, where does the fresh water come from if not from the melted ice? Outside the rising current of diluted sea-water next the ice there is a descending radiation-cooled current of sea-water drawn from a distance and flowing underneath the ice-cooled water on the surface. This downward current is accepted by Prof. Barnes and Dr. Pettersson, though Prof. Barnes does not admit the existence of the cold-surface current. Accepting the existence of these currents in the water surrounding icebergs, the following explanation was offered in NATURE (March 16, 1913) of the rising temperature observed on approaching icebergs. The surface water at a distance from a berg has a higher temperature than the water immediately underneath it. That is, outside the influence of the berg the temperature decreases with the depth, so that when the surface water is submerged by the cold-surface current, it is sunk to some depth beneath the surface, the result of this being that a thermometer sunk to a depth of, say, 16 ft. when at a distance from the berg registers a lower temperature than if placed in the surface water; but if the deeply submerged thermometer be moved into the water near the berg, it will now register a higher temperature than it did at a distance from it, because it will now be in the submerged-surface water, the temperature of which will probably have fallen to some extent in its passage under the cold-surface water. The effect of the movement of the ship towards the berg is virtually the same as raising the thermometer towards the surface when the ship is outside the influence of the berg. In the letter referred to I suggested the use of two thermometers, one near the surface, the other at some depth, and registering together, when an inversion of the temperature would indicate the approach to ice, if the explanation be correct. If this inversion of temperature really does exist, it might be detected by the ordinary tilting thermometers, one in the water near the surface, and others at depths down to three or four fathoms, as the difference that might be looked for from Prof. Barnes's thermograms amounts at times to a degree or more Centigrade, an amount easily detected by means of thermometers of that kind.

It is a great misfortune that the thermometer in the condensation water of the *Scotia* could not be repaired for the investigation. The depth at which

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