

## LETTERS TO THE EDITOR.

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## The Thomson and Peltier Effects.

A MODIFIED Joule radiometer has been applied successfully to show the existence of the Thomson effect in copper and the Peltier effect at the junction of two dissimilar metals.

The lower part of a vertical glass tube 3 cm. in diameter was divided into two compartments by a cardboard diaphragm *a*, 12 cm. long. A rectangular strip was cut away from the upper part of the partition, and a mica plate, *b*, was substituted for a similar strip from the lower part. A thin copper wire *cd*, No. 36, was soldered to two thick copper leads, No. 16, fixed into a cork. The wire *cd* was passed through a slit in the mica plate *b*, and the cork was pushed to within 1 cm. of the lower edge of the partition. The wire *cd* was arranged so that it was nearly bisected by the mica plate. A mica vane *e* attached to an aluminium wire was suspended by a quartz fibre within the aperture in the upper part of the partition. A horizontal disc of cardboard, shown dotted in the figure, was fixed to the upper cork by a pair of rods, and fitted inside the tube just above the vane. A horizontal sector-shaped plate of mica was fastened to the partition just below the vane to complete a channel for the current of air from the warm to the cool side of the partition. The clearance between the edges of the vane and the opening was about 1.5 mm., and the angular movement of vane was restricted by stops to about 30°. The motion of the vane was observed by reflecting a beam of light from the mirror *m* on to a scale at a distance of 80 cm.



The partitioned tube, together with the suspended vane, constitutes a Joule radiometer in which unequal heating of the columns of air in the two compartments will cause a deflection of the vane. The radiant heat from a candle flame at a distance of 2.5 metres falling on one side of the partition produced a deflection of 5 cm. of the spot of light on the scale. Owing to its high sensibility, it was found necessary to shield the columns of air from draughts and radiant heat from external sources.

The current of 6 amperes was passed through the thin copper wire *cd*, and a temperature gradient was thus established from the centre towards each end of the wire. The vane was deflected owing to the Thomson effects and the inequality of the Joule effects in the two halves of the wire. The position of the vane was fairly steady after an interval of five minutes, and the spot of light was brought to the centre of the scale by turning the bent wire *n* attached to the fibre. The current was rapidly reversed, and the spot of light moved quickly through 8 cm. on the scale. The wire *cd* was adjusted to slightly different positions in order to vary the inequality of the Joule effects, and practically the same result was found in every case. It was concluded from the direction of motion of the vane that in copper heat was absorbed when the current flowed up the temperature gradient.

To show the Peltier effect, an iron wire 4 cm. long and 1 mm. diameter was soldered to another pair of copper leads and bent just under the partition. The passage of a current of 1 ampere through the junctions was sufficient to move the spot of light off the scale. There is no need to reverse the current in this case, and it can be shown quite easily that heat is absorbed when the current flows from copper to iron.

F. W. JORDAN.

South-Western Polytechnic, Chelsea, S.W., May 8.

NO. 2168, VOL. 86]

## Compulsory Latin Diagnoses for Fossil Plants.

THE question whether descriptions of new species, genera, &c., of fossil plants should be accompanied in future by a diagnosis or diagnoses in Latin has been recently discussed among those who are working on fossil botany. It is not proposed here to enter into the arguments which have been advanced either for or against this proposition. It appears, however, that, so far as palaeobotany is concerned, the arguments against the use of diagnoses in Latin are held far to outweigh those in favour of such diagnoses. In order to test current opinion on this point, a memorandum has been recently circulated by the writer among those who are engaged in the study of fossil plants in this country and in the United States, and by Prof. Nathorst in Sweden and Denmark. The object of the memorandum was to ascertain the present intentions of those working at fossil plants as regards this much disputed question. The result of this exchange of opinion has been very remarkable. Every palaeobotanist in this country, in the United States, and in Scandinavia to whom a copy of the memorandum has been sent has expressed his intention of avoiding the general use of diagnoses in Latin, and, further, of recognising as valid diagnoses instituted in the future which are not published in Latin.

The memorandum in question contained two statements of intention, which were as follows:—

(1) "I do not propose to include a diagnosis in Latin in the description of any new species, genus or family that I may institute in the future, unless there appear to me, in particular cases, to be special reasons for so doing."

(2) "I will not refuse to accept new species, genera or families of fossil plants instituted by other workers in the future, solely on the ground that their description is not accompanied by a diagnosis in Latin."

The following is a list of those who have subscribed to both these statements. In the case of those names indicated by a \*, some slight modification of the wording of one or other statement was made. These reservations follow the list of signatures:—

Mr. C. T. Bartholin, Copenhagen, Denmark.

Dr. M. J. Benson, Royal Holloway College, Englefield Green, Surrey.

Prof. E. W. Berry, Johns Hopkins University, Baltimore, U.S.A.

Prof. T. D. A. Cockerell, University of Colorado, Boulder, U.S.A.

Mr. W. T. Gordon, The University, Edinburgh.

Dr. Th. G. Halle, Stockholm, Sweden.

Dr. N. Hartz, Copenhagen, Denmark.

Dr. G. Hickling, The University, Manchester.

Mr. H. S. Holden, University College, Nottingham.

Mr. A. Hollick, New York Botanic Garden, New York, U.S.A.

Prof. E. C. Jeffrey, Harvard University, Cambridge, U.S.A.

Dr. R. Kidston, F.R.S., Stirling.

Dr. F. H. Knowlton, U.S. Geological Survey, Washington, U.S.A.

Mr. F. J. Lewis, The University, Liverpool.

Mr. A. J. Maslen, London.

Dr. H. Möller, Falun, Sweden.

Prof. A. G. Nathorst, Stockholm, Sweden.

Prof. F. W. Oliver, F.R.S., University College, London.

\* Mr. Clement Reid, F.R.S., The Geological Survey, London.

\* Mrs. Clement Reid, Milford-on-Sea, Hants.

Dr. D. H. Scott, F.R.S., Oakley, Hants.

Mrs. D. H. Scott, Oakley, Hants.

Dr. M. C. Stopes, The University, Manchester.

Mr. H. H. Thomas, The Botany School, Cambridge.

Mr. D. M. S. Watson, The University, Manchester.

Prof. F. E. Weiss, The University, Manchester.

Dr. D. White, U.S. Geological Survey, Washington, U.S.A.

Dr. G. R. Wieland, Yale Museum, New Haven, U.S.A.

Mr. and Mrs. Clement Reid have signed both statements with the addition of the words "if it is accompanied by a recognisable figure" at the close of the second statement after the words "diagnosis in Latin." They add,