That the mathematics of mechanics is at present inadequate to solve all the problems offered is simply because, as Whewell pointed out, the procedures of mathematicians do not yet furnish the necessary apparatus. But to say (as on p. 225) that 'the mechanical conception of heat has not been confirmed;' in the face of the latest treatises on thermo-dynamics, based throughout on the laws of motion, is an inexplicable assertion.

The 'way out' of scientific materialism is not by the assumption of an entity apart from attributes; but by the indisputable truth that the laws of mechanics and motion themselves are in final analysis nothing else but laws of thought, of the reasoning mind, and derive their first and only warrant from the higher reality of that mind itself. D. G. BRINTON.

THE RÖNTGEN RAYS.

PROF. RÖNTGEN concludes his paper *On a New Kind of Rays* by showing that they behave quite differently from the visible, the infra-red and the hitherto known ultra-violet rays, and by suggesting that they should be ascribed to longitudinal waves in the ether. He does not, however, indicate how longitudinal waves would account for the phenomena, and probably most readers of his paper have not seen any evident connection between longitudinal vibrations and the behavior of the Röntgen rays. Prof. R. S. Woodward has, however, called the writer's attention to a fact which Prof. Röntgen does not mention, but which may have been present in his mind. If there be longitudinal waves in the ether they must travel with much greater velocity than the transverse waves. Would not this greater velocity account for the absence (partial or complete) of reflection and refraction, and for the penetration—even the fact that this tends to be inversely proportional to the density of the substance? J. McK. C.

CYCLONES AND ANTI-CYCLONES.

TO THE EDITOR OF SCIENCE: In connection with the diagrams published by Prof. Davis in a recent issue of SCIENCE (N. S. Vol. III., p. 197), showing the circulation of the wind and cirrus clouds in cyclones and anti-cyclones, it seems to me a few words should be added in regard to the method by which the results were obtained. Åkerblom, following Hildebrandsson, found the mean directions of the wind and clouds for different directions and intensities of the barometric gradient as observed at the earth's surface and then drawing concentric circles plotted the results around a central area. This method is not the same as finding the relation of the wind and cloud movements to the centers of cyclones and anti-cyclones. A given gradient is sometimes very near the center of a cyclone or anti-cyclone, at other times far removed from it, and again there may be no well-defined cyclone or anti-cyclone, but merely what are called straight isobar gradients.

At Blue Hill I have found considerable differences between the directions and velocities of the upper currents near to and at a distance from the centers of cyclonic and anti-cyclonic action, and it leads me to the conclusion that mixing together observations made at the two points can only lead to confusing results.

The results of Åkerblom for central Germany by no means agree with the results of Dr. Vettin for Berlin as regards the movements of the cirrus in anti-cyclones. Dr. Vettin found the average movements of the cirrus in relation to the direction of the center of the anti-cyclone, and his results agree remarkably well with those found at Blue Hill. (Amer. Meteor. Jour., Vol. X, p. 172.)

H. HELM CLAYTON.

BLUE HILL MET. OBSERVATORY, Feb. 10, 1896.

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*SCIENTIFIC LITERATURE.*

*A Handbook to the British Mammalia.* By R. LYDEKKER. Allen's Naturalists' Library, edited by R. Bowdler Sharpe. 8°, pp. 339, col. pls. and text figs. London, 1895. 6 shillings.

From early times the British Mammalia have received a large share of attention. Beginning with Thomas Pennant's British Quadrupeds, in 1786, we have: Memoirs of British Quadrupeds (including a Synopsis), by the Rev. W. Bingley (1809); Natural History of British Quadrupeds, by Edward Donovan (1810–1820); Recreations in Natural History, or Popular Sketches of British Quadrupeds, by W. Clarke