plan of reducing the number of courses necessary to a degree from eighteen to sixteen, but it was rejected by the overseers.

Converse College established about five years ago at Spartanburg, S. C., has received a gift of $70,000 from Mr. D. E. Converse, together with $30,000 given by the citizens of Spartanburg, S. C.

At a meeting of the Council of the University of the City of New York, the University medical faculty reported in favor of extending the course for degrees of doctor from three to four years. The Council approved a plan for a College Close which includes an inner court measuring about 250 feet in width by 300 feet in length. Fronting upon this, five residence halls and a dining hall will be built.

DISCUSSION AND CORRESPONDENCE.

KEW'S DISPERSAL OF SHELLS.

Editor of Science: In the review of Kew's *Dispersal of Shells* by Dr. Packard, the reviewer points out certain omissions which could not have been overlooked by Mr. Kew if he had taken the trouble of consulting either Gould or Binney in the original. For a volume of the International Series the book is amazingly provincial. I do not wish by this expression to gainsay its value; it is an exceedingly valuable collection of notes, memoranda and isolated items referring more particularly to the dispersal of shells in England. Dr. Packard has inadvertently overlooked a very important omission in there being no reference to the dispersal of Litorina litorea from its centre at Halifax, Nova Scotia (where it was first introduced from the other side of the Atlantic) along the shores of the Bay of Chaleur, and southward to New York and beyond. In Science News for 1879 Mr. Arthur F. Gray called attention to the successive occurrence of this species as it spread southward along the coast. Professor Verrill in the American Journal of Science, for Sept., 1880, records his observations regarding the dispersion of this species. In the Essex Institute Bulletin for 1880, in a paper on the Gradual Dispersion of Certain Mollusks in New England, I presented a map of the New England coast and upon this was marked chronologically the dates of the appearance of this large and conspicuous mollusk as it found its way south. In this paper I showed what a barrier Cape Cod offered for some years. My last find was at Glen Cove, Long Island. In the same paper I called attention to the dispersion of Pupa muscorum (badia, of Adams) from its first place of observation in Vermont, into various parts of New England. I think Binney was wrong in believing that Helix hortensis was introduced into New England since the advent of the European. I have discovered Helix hortensis on islands in Casco Bay, buried in the lowest deposits of shell heaps containing bones of the Great Auk. The occurrence of this species in such positions could not be accounted for by supposing that the creature had burrowed down to the lowest level of the deposits, for the mass was too compacted to admit of this explanation. I have found them under stones resting on the primitive surface of the ground associated with other species found only in hard wood growths, and now coniferous trees only abound in these places. It is certainly extraordinary that this species is only found living on the outer islands of New England—its habits being entirely different in this respect from its English relative.

Edward S. Morse.

Salem, February 18, 1896.

'SCIENTIFIC MATERIALISM.'

Editor of Science: A few remarks on the article 'Scientific Materialism' in Science, February 14th, may not be out of place.

It seems a case of 'reversion' to speak of 'energy' as something distinct from force, or rather from definite forces. Energy apart from force is inconceivable. To quote Lewis' example, we might as well speak of 'cellarity,' as something apart from cellars!

The definite forces with which science deals are, as every one knows, simply modes of motion. Hence Helmholtz, Tait, Romanes and most modern students have regarded matter, atoms, molecules, all as but expressions of motion, and to be analyzed by the three primary laws of motion and the theorems derived from them. Of course this leads inevitably to a strictly mechanical conception of phenomenal existence.

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.

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