THE Royal Society announces that two John Foulerton studentships will shortly be awarded for original research in medicine, the improvement of the treatment of disease, and the relief of human suffering. Researches must be carried out under the supervision and control of the Royal Society. The studentships are of the value of £400 each, and are tenable for three years, but may be extended to a total period of six years. Candidates must be of proved British nationality; both sexes are eligible.

UNIVERSITY AND EDUCATIONAL NEWS

AT a recent meeting of the New York Endowment Fund Committee of the Massachusetts Institute of Technology, Mr. Coleman du Pont presiding, President R. C. MacLaurin announced that $1,500,000 had been subscribed toward the $8,000,000 endowment fund. "Mr. Smith," the anonymous donor of $7,000,000 to the institute, has agreed to give $4,000,000 to the fund if $3,000,000 is pledged by January 1, 1920.

DR. GEORGE W. CRILE, of the School of Medicine of Western Reserve University, has given $100,000 to endow a chair of surgery. Dr. Crile is chief of the surgical staff of the school. He headed the Lakeside Hospital Unit of Cleveland, one of the first American units in France.

COLUMBIA UNIVERSITY has received a gift of $6,000 for research work in food chemistry.

PROFESSOR SAMUEL N. SPRING has returned to the United States for the first term of the present college year to teach silviculture, forest law and policy in the Department of Forestry at the University of Missouri. He will resume his work as professor of silviculture at Cornell University on January 1, being at present on leave of absence.

RICHARD M. FIELD has been appointed assistant professor of paleontology and historical geology at Brown University. He also continues his association with the research staff of the Museum of Comparative Zoology at Cambridge.

EDWARD H. MACK, Ph.D. (Princeton, 1916), has returned from overseas duty and has gone to the Ohio State University as assistant professor of physical chemistry.

PROFESSOR EDWIN MORRISON, for thirteen years head of the department of physics at Earlham College, has been granted a year's leave of absence and is teaching engineering physics in the Michigan Agricultural College.

C. M. YOUNG, formerly of the University of Kansas, has returned as professor and head of the department of mining engineering.

DR. HORST OERTEL has been appointed head of the department of pathology at McGill University.

DR. EDWARD HINDLE, Kingsley lecturer and fellow of Magdalene College, Cambridge, assistant to the Quick Professor of biology, has been elected to the chair of biology in the School of Medicine, at Cairo, Egypt, in succession to professor A. Looss. Dr. Hindle was instructor in zoology at the University of California from 1909 to 1910.

DISCUSSION AND CORRESPONDENCE

DOUBLE USE OF THE TERM ACCELERATION

TO THE EDITOR OF SCIENCE: The use of clear and distinct meanings of terms has not kept pace with the progress in science. One repeatedly hears appeals for the stardardization of the meanings of terms. Great confusion arises when different writers use the same term with entirely different meanings. In the writer's opinion, it is quite as important to fix the definitions of the fundamental terms as it is to fix the units; scientific organizations ought to get together, arrive at some conclusion, and then appeal to the Bureau of Standards to officially standardize such definitions as they do the units.

A notable case which gives rise to much confusion, is the term acceleration. The engineer always used this term to mean the rate of increase of speed, that is, velocity divided by time, hence its dimensions are LT^{-2}; it is measured in feet (or meters) per

second per second. The physicists, however, who use this term in the same sense, also use it indiscriminately in an entirely different sense, namely, to express a change of direction of a moving body, without any regard as to whether there is any change in speed or not. Thus the physicist will refer to the existence of acceleration when to the engineer there is none. A case in point is the revolution of a fly wheel at a constant speed, the rim of which to the physicist is being constantly accelerated while to the engineer there is no acceleration, as the speed is constant.

The physicist argues, and quite correctly, that a moving body represents a vector quantity, as it has both speed and direction. The same external force applied to such a moving body will change either the speed or the direction, depending upon the relative directions of that force and of the moving body. But as force is defined as mass $\times$ acceleration, the physicist, apparently forgetting the difference between pure and applied mathematics, methodically divides this force by the mass and calls the quotient acceleration. It simplifies his mathematics.

Such blind applications of pure mathematics, however, sometimes lead to absurd results. In the present case, if this external force is applied in the direction of the movement of the body, it adds energy to the moving system, as in the case of a falling body. This is the sense in which engineers use the term acceleration. But if this external force is applied perpendicularly to the direction of motion, no energy whatever is added to the moving system, as in the case of bodies rotating around a center.

The importance of this distinction is shown in the common term foot-pounds, the product of feet and pounds (of force). If both are in the same direction this product represents energy, while if perpendicular to each other it represents torque, which is decidedly not energy. The writer long ago suggested to use the term pound-feet, when it refers to torque, in order to call attention to the difference.

In the MLT system of dimension of physical quantities, force multiplied by length gives energy; hence torque has the dimension of energy, when as a fact they are two entirely different physical quantities. The reason for this inconsistency is that in this system an angle has no dimension, yet we know that torque (which is not energy) when multiplied by an angle gives energy, hence an angle must have some dimensions. This is one of the serious shortcomings of that system. It is also the cause of the double use of the term acceleration.

When force is defined as mass $\times$ acceleration, it should be understood that the angle is eliminated by being zero; acceleraton is then always a change of speed, the sense in which the engineer uses that term. A new term should be used when the force is at right angles to the direction of motion, in which case it adds no energy to the system and produces no change in speed, but merely a change of direction. For any angle between 0 and 90° no further distinction is required as the resultant then is always the vector sum of the two components at 0 and 90°.

Such a distinction between these two different meanings of acceleration is very desirable in order that the engineer and the physicist may always understand each other without confusion.

Carl Hering

Philadelphia,
October 7, 1919

AN ORNITHOMIMID DINOSAUR IN THE POTOMAC OF MARYLAND

A recent study of some of the dinosaur specimens in the United States National Museum from the Arundel formation of Maryland has led to a discovery of more than ordinary interest. It is the recognition of an undoubted Ornithomimid dinosaur, the first representative of this group to be found east of the Rocky Mountain States, or geologically below the Judith River formation of the Upper Cretaceous.

The materials on which this determination rests consist of various bones of the hind foot, pertaining to more than one individual. Originally some of these elements were in-