author of "The Effect of Tropical Light on White Men" and "Expansion of the Races."

DR. HUGO MÜLLER, F.R.S., past-president of the British Chemical Society, died on May 23, aged eighty-one years.

SIR A. H. CHURCH, F.R.S., formerly professor of chemistry in the Royal Academy of Arts, London, died on May 31, at the age of eighty years.

THE death is announced of M. Pierre Martin, known for his work on the metallurgy of steel.

DR. OSWALD LOHSE, head astronomer in the Potsdam Astrophysical Observatory, has died at the age of seventy-one years.

GRAND DUKE CONSTANTINE CONSTANTINOVITCH, who died on June 15 at the age of fifty-seven years, was actively interested in science and letters. He was at the time of his death president of the Imperial Academy of Sciences.

DR. JOHANNES SCHLUNCK and Dr. Erich Meyer, geologists, of the German survey, have been killed in the war.

LEAD is one of the first metals that would naturally be associated with an increased consumption in time of war, and yet the exports of lead from the United States to Europe since the war began have not increased in proportion to the increase in exports of zinc and some other metals, and the price of lead instead of being enhanced by the war actually slumped in October to the lowest point reached in the last fifteen years. These and other facts are graphically presented in the advance statement of the production of lead in the United States in 1914, just issued by the United States Geological Survey. The total production of refined lead from both domestic and foreign ores was 542,122 short tons, compared with 462,460 tons in 1913. The production of refined lead from domestic ores was 512,794 tons, an increase of 100,916 tons over the record figures reached in 1913. This increase was due chiefly to gains in Missouri, about 42,000 tons; in Idaho, 40,000 tons, and in Utah, 18,000 tons. The exports of lead smelted from foreign ores were 30,944 tons and from domestic lead ores 58,722 tons, a total of 89,666 tons, larger than in any other year since 1911, when the exports of lead aggregated 113,307 tons. No domestic pig lead had ever been exported from the United States prior to 1914. Generally the price of lead in this country, owing to the tariff, exceeds the price abroad. Lead smelted in bond from foreign ores is therefore exported instead of domestic lead. Owing to the civil war in Mexico the imports of Mexican ore for the last few years have been much smaller than heretofore, and there was not enough foreign lead in the United States to supply the demand. Lead was consistently higher in London in 1914 than in New York, and this, together with the scarcity of Mexican lead, caused the large exports of domestic lead.

UNIVERSITY AND EDUCATIONAL NEWS

DR. ARTHUR A. NOYES, of the Massachusetts Institute of Technology, is to become a member of the faculty of the Throop College of Technology, Pasadena, Cal., for a portion of the coming academic year, and for one half of the time in succeeding years, beginning with 1916–17, this arrangement having been made possible by a gift of $10,000 for the equipment of a physical chemistry laboratory, and the endowment of this laboratory in a sum yielding $10,000 annually for its support. This laboratory is to be located in a new chemistry building, which is expected to be built during the coming academic year.

PROFESSOR ROBERT L. SACKETT, formerly of the civil engineering school of Purdue University, Lafayette, Ind., has been appointed dean of the engineering school of Pennsylvania State College. Professor Sackettt succeeds Professor John Price Jackson, who is now commissioner of labor for the state of Pennsylvania.

AT the laboratories of the New York Postgraduate Medical School and Hospital, Dr. Ward J. MacNeal has been appointed director to succeed Dr. Jonathan Wright, resigned. The following promotions have been made: Dr. Morris S. Fine to be adjunct professor of pathological chemistry; Dr. Richard M. Taylor to be adjunct professor of pathology;

Dr. Paul A. Schule to be lecturer in bacteriology.

DR. FLORENCE PEEBLES, of Bryn Mawr, has been appointed professor of biology in Newcomb College, Tulane University, New Orleans.

ASSISTANT PROFESSOR HAROLD A. EVERETT, of the department of naval architecture and marine engineering of the Massachusetts Institute of Technology, has been appointed to the position of professor of marine engineering in the post-graduate department of the United States Naval Academy at Annapolis.

HENRY JOSEF QUAYLE has been promoted to a full professorship of entomology in the citrus experiment station and graduate school of tropical agriculture of the University of California.

MR. H. SCOTT, of Trinity College, Cambridge, has been appointed curator in entomology in the university.

DISCUSSION AND CORRESPONDENCE

THE FUNDAMENTAL EQUATION OF MECHANICS AGAIN

TO THE EDITOR OF SCIENCE: I have followed with the utmost interest the correspondence in SCIENCE on the proper method of teaching the relation between force, mass and acceleration, and have heretofore refrained from adding to the discussion. I am mindful that there must be many readers of SCIENCE who have not had any advanced courses in mechanics, but who are trying to present to their students this equation, adaptable to any system of units, in a way that does not seem artificial. The difficulty of teaching this properly to students who have had little practical experience, and no occasion to do any amount of computing, and who will probably not go beyond their first course in physics, must be apparent to all. At the risk of being hissed out, I beg your leave to state a method often used, and which I have always found very successful with my classes at Wells College.

I follow a program very much like that outlined by Gordon S. Fulcher in your issue of April 30. I teach the dependence of acceleration on force, using the same mass, etc.; and set up equations in the form of proportions. The combined equation would then be

$$\frac{F}{F_0} = \frac{M}{M_0} \cdot \frac{A}{A_0}.$$

Then following a method similar to that used in books on geometry in the treatment of the area of a rectangle, I say that we may take as our unit of force that force which gives to unit mass a unit acceleration. Then *numerically* $F = MA$; if the unit of mass be the gram, and of acceleration, the cm. per sec. per sec., then the unit of force is called the dyne. All equations in which a force is computed by multiplying a mass by its acceleration, would give the answer in dynes. But the dyne is inconveniently small. A more natural unit is the weight of a kilo. To obtain the force expressed in the larger unit, "we divide the answer expressed in the smaller units by the number of the smaller units contained in the larger unit." Then I go on to explain that this procedure of taking natural units is very common: one person is head and shoulders above another, a certain type of tree is about twice the height of a man, etc. If you multiply the number of square yards in a floor by the price (in cents) of one square yard of carpet, and you want the answer in dollars, divide by the number of cents in a dollar.

It is easy, then, to go over to the British system, in which we have but an artificial analogue of the dyne. Let us fetch that backward baby, the poundal, into the room for an inspection, at least long enough to learn that the weight of a pound is 32 poundals. Then remembering that, for instance, centripetal force, $= mv^2/r$, is in absolute units, we get that force in pounds' weight by dividing by 32.

I have little sympathy for those who "inflict" on their students such absurd ideas as that we measure sugar, stones or anything else in one kind of pounds, but use a different pound when we find the force necessary to accelerate that mass. And the idea of a gravital is equally bizarre.

As for the metric system, I am almost discouraged at the conservatism of this progressive (?) nation. It is perfectly true that it would involve a large expense to change our manufacturing machinery to conform to the