From a man of Dr. Leidy's industry we may expect to hear of many plans entertained but subsequently abandoned, of many discoveries actually his own with which his name is not associated. At one time he contemplated writing a work on comparative anatomy, but was deterred from so doing when, upon inquiry of the publishers, he learned how small was the demand for writings of this kind. We cannot but regret that he did not entertain the subscription plan for reimbursement. For no one can doubt the fact that his admirers would have eagerly provided the means for publication had his wishes been more generally known. Respecting his unrecorded discoveries no one can speak with authority. On one subject he has himself spoken, namely, that the discovery of the tactile corpuscle on the nerves of the finger is his own. He occasionally referred to this as an instance of the dangers of procrastination in not placing upon record original observations the moment the facts became clearly defined in the mind of the investigator. He also frequently alluded to his having observed the amæboid movement in the white corpuscles. But he interpreted them to be pathological and hesitated in recording his discovery. This he used to say was one of the greatest mistakes of his life. But no discoveries of this kind were possible at the stage of microscope technique which Leidy commanded; were our knowledge of this property of the white blood corpuscle lost to us it would be exceedingly difficult to re-establish it without the use of the warm stage.

Such is a brief epitome of the labors of Joseph Leidy in the anatomy of vertebrates. It is a theme for a volume. But the man is greater than his works. All who knew Dr. Leidy are witnesses to the impression of strength in reserve he at all times made. It can be said of him as has been said of Haller by Francis Horner: "I never rise from an account of such a man without a sort of thrilling palpitation about me which I know not whether I should call admiration, ambition, or despair."

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Work and Energy.

IN many of the standard text-books and treatises on mechanics there is a lack of definiteness in the elementary treatment of the subjects of work and energy that often proves troublesome to the student. To illustrate this, let us place side by side the definitions of work and energy given in the "Syllabus of Elementary Dynamics" prepared by the Association for the Improvement of Geometrical Teaching.

(*a*) When the particle (or point of a body) to which a force is applied moves in the line in which the force acts, the force is said to do work, or to have work done against it, according as the motion is in the sense of the force or in the opposite sense.

(*b*) Energy is a general term for the capability of doing work, which from any cause a mass, or different masses in their relation to one another, may possess.

These definitions are in substantial agreement with those most often given, and are the only explicit statements usually found as to the meaning of work and energy.

A careful reading shows, however, that there is in definition (*b*) an implicit suggestion of something not definitely stated, and concerning which a definite statement is very much needed. According to the definition, energy is possessed by masses (i.e., by bodies); or, in other words, a body may do work. But what is meant by a body doing work? In most text-books the student will search in vain for a definite answer to this question.

Another question is suggested by the definition of work above quoted. It is clearly stated when work is done by a force and when work is done against a force. But in the latter case, what is it that does the work?

These two questions are sure to present themselves to the thoughtful student. If the definition of work were so stated as to furnish explicit answers to them, the acquirement of correct notions would be much facilitated.

A source of confusion slightly different from that above mentioned is found in certain books. Work is defined as if always done by forces; while energy is defined simply as capacity for doing work. The inference might naturally be drawn that energy is possessed by forces. But the student who draws this logical conclusion will be perplexed by finding that, in what follows, energy is always referred to as belonging to bodies instead of forces.

As an improved statement of the fundamental definitions of work and energy, the following may be suggested:

1. A force does work upon the body to which it is applied when the point of application moves (or has a component of motion) in the direction toward which the force acts.

2. A body does work against a force applied to it when the point of application moves (or has a component of motion) in the direction opposite to that toward which the force acts.

3. A body possesses energy when its condition is such that it can do work against applied forces.

Definitions (1) and (3) are not substantially different from definitions commonly given. Definition (2) is usually not given explicitly, though always implied in the development of the theory of energy.

It is quite possible that these definitions may admit of improvement. They must, of course, be accompanied by quantitative statements as to how work and energy are to be computed. But it is believed that the clear development of the subject is much facilitated if explicit definitions similar to these are given at the outset.

No attempt is here made to criticise all the various methods of treating the subject of work. Other forms of definition than the one above considered are found in various books. In most cases, however, they lead to the same difficulty above mentioned.

A treatment practically identical with that here suggested is adopted in McGregor's "Kinematics and Dynamics" — a book possessing many other admirable features — and possibly in other works. It certainly is not adopted by some of the best known English writers.

L. M. HOSKINS.

Madison, Wis., Nov. 9.

AMONG THE PUBLISHERS.

EVER since the announcement made last winter that the author of "Robert Elsmere" had a new novel under way, expectation has been eager to know when it would appear. Mrs. Ward, like George Eliot, has once more taught us that fiction, far from being merely a superficial representation of passing situations and emotions, may grapple with the greatest problems and teach men noble truths. It is with pleasure, therefore, that we publish the fact that Mrs. Ward's new book is to appear very soon from the press of Messrs. Macmillan & Co., New York, and that it is to be called "The History of David Grieve." It is understood that the book will trace the career of a disciple of the Elsmerian doctrines in his work among the poor of London.

— There lives an Indian people on the Carribbean coasts of Nicaragua and parts of Honduras, which is largely mixed with African and Indian elements, foreign to them, on the littoral tracts, but farther inside is of purer race. This people is known to the whites as Moskitos, or as they want to be called, *Misskitos*; their language was but imperfectly studied, probably because the tribes inspired their visitors with contempt on account of their subserviency to English interests. Only the missionaries of the Herrenhut denomination spent time enough for mastering entirely the intricacies of this tropical language, and from their writings,