vote themselves to some special and graduate work.

4. The securing men of distinction to lecture, and for a time to reside at the University.

These uses of the fund are not made absolutely binding upon the trustees for all time, but the donor expressed a desire to make the gift as flexible as possible in its application, recognizing the fact "that gifts to universities hemmed in too closely by restrictions are liable to lessen in value as time goes on."

In pursuance, however, of the end in view in the foundation, definite action has been taken in the establishment of a considerable number of Graduate Scholarships and Fellowships. The recommendations which were made regarding these have been approved and will now go into force. There are eight Graduate Scholarships giving free tuition and $100 open to those coming from the liberal courses in the College of the University; and there are, with the Hector Tyndale Fellowship in Physics, now fifteen fellowships, fourteen of which, coming from this Foundation, are open to students of any university. The amount of the tuition deducted from the full value of the Fellowship ($600) does not go into the general funds of the University, but may be used for the purchase of books or apparatus which will aid the student in his work, or may be used in the publication of theses.

A somewhat unusual feature is the establishment of Senior Fellowships, open only to those who have taken the Doctor's degree in the University of Pennsylvania. This amounts to the introduction, in a modified form, of the 'Docent' system of German universities, the object being not at all to use the Senior Fellow as a teacher for the sake of the value he may be to the University, but to test him and give him an opportunity to do a little teaching in the direct line of his special work. From the Senior Fellowships there is no reduction for tuition. This gives eight Graduate Scholarships, fifteen Fellowships and five Senior Fellowships, making twenty Fellowships in all. Fourteen of the Fellowships are open to men from other institutions, but the Senior Fellowships are limited to those having taken the Doctor's degree from the University in order that some of the best men may be kept in residence here as long as possible, and their influence felt among the students.

The whole plan aims at building up a cultured group of men interested in the advancement of knowledge and who shall be in residence at the University. Probably most of them will live in the dormitories, and their influence will undoubtedly be for good in the institution. The whole time of every incumbent of a Fellowship or Scholarship must be given to his scholarly work at the University.

GENERAL.

MR. W. C. MCDONALD, a tobacco manufacturer of Montreal, has given $500,000 to McGill University for the purpose of providing a building for the study of chemistry, mining and architecture. This brings his gifts to this university up to $2,000,000.

MR. F. C. MACAULEY, of Philadelphia, has bequeathed to the University of Pennsylvania his library, $5,000 for the purchase of books relating to Dante and Tasso, and $5,000 for archæological researches in America. The bequest to take effect on the death of his brother.

THE name of the University of the City of New York has been changed to New York University by the Board of Regents.

DR. O. CONE has resigned the Presidency of Buchtel College.

PROF. EARL BARNES and Prof. Ewald Flügel, of Stanford University, and Prof. Bernard Moses, of the University of California, are each to deliver a series of fifty lectures at the University of Chicago during the spring term.

DISCUSSION AND CORRESPONDENCE.

CERTITUDES AND ILLUSIONS.

MAJOR POWELL, having escaped (but temporarily, I fear) from the metaphysicians, has courageously entered the camp of the physicists in his paper of March 20th. Now the latter, as a class, are proverbially a simple-minded people, given rather to 'Certitudes' than to 'Illusions' and, as a rule, especially anxious to know what they are talking about, when they talk. They have a distinct fondness for the use of words whose meaning is precise and not

open to dispute and, with their brethren the mathematicians, generally prefer to begin a discussion by defining the terms they are about to use, unless such terms are already so restricted and definite in their meaning as to cause no doubt.

Failure to pursue this course is the basis of much idle talk and meaningless controversy, especially at the present time.

People are everywhere talking about an 'honest dollar,' or 'sound money,' without stopping to ask what a dollar *is*, or what is meant by 'money,' or a 'standard of value,' without inquiring what *is* 'a standard and what is meant by value,' and all of this to the confusion of many who would like to give serious thought to important subjects. As Major Powell's philosophy is to furnish a basis for the elementary concepts of physical science, he will not, I am sure, take it amiss if he is asked in the beginning to define with some care the principal terms of which he makes use. No physicist can fail to read his last paper with much interest and, it may be added, with no little astonishment. To one accustomed to the rather simple perspective of the so-called exact sciences, there is a sort of mistiness and obscurity in it which suggests an 'impressionist's' view of the subject.

It is true that in the beginning definitions of 'body,' 'particle,' 'molecule,' 'atom,' etc., are given, which are quite satisfactory as representing the meaning which the author proposes to attach to these words. But the physicists are put entirely out of the controversy by the failure of the author to tell or even hint at what he means by that which is the text of the whole paper, namely, *motion* itself. Major Powell undertakes to show that "motion is persistent," that it "cannot be created or annihilated," and he even goes so far as to declare that this has been demonstrated to the satisfaction of a great body of scientific men. He speaks, often, of 'motion as speed,' thus creating an anxiety to know what 'motion' is when it is not 'speed.' By 'speed' he evidently means 'velocity' as independent of direction, and he declares that 'motion as speed' is 'inherent in matter' and is not imposed upon it from without, from which it necessarily follows that it cannot be transferred from one system to another. Acceleration, he then says, must be considered as 'deflection' or change in that element of motion which is 'direction,' and not in any correct sense a change in velocity. No one will deny a considerable ingenuity in reaching this conclusion, but there are a few obstacles in the way which Major Powell will doubtless easily sweep aside, some of them being suggested in the following questions:

1. What is motion?
2. What is rest?
3. If by 'motion as speed' is meant 'velocity,' and if by its 'persistence' is meant invariability of velocity, what possesses this invariability?—bodies, molecules, particles, atoms?—and *in reference to what* is the velocity constant?
4. As a molecule is considered as a 'body' when reference is had to the atoms which compose it, can it have an 'invariable velocity' as a molecule and variable velocity as a 'body'?

Many other doubts suggest themselves which will probably be quieted by the answers to these questions. I cannot refrain from expressing a hope, however, that in addition to these answers, Major Powell will kindly furnish an explanation of what he means when he says that the transmission of light at the rate of 299,878,000 metres per second furnishes an example of 'particle motion at a velocity so great that any observed molecular motion sinks into insignificance.' M.

March 23, 1896.

Principles of Marine Zoögeography.

I have been much interested in the admirable review, by Dr. Baur,* of Dr. Ortmann's 'Grundzüge der marinen Tiergeographie,' which I had only previously known from the 'summary' given in 'the Princeton College Bulletin' (VII., pp. 100–107); since then I have had the pleasure of receiving the work itself from the learned author. I find similarity in some features and difference in others between the views of Dr. Ortmann and my own. My contributions to zoögeography appears to have been unknown to Dr. Ortmann, except at second-hand, although exact references were made to publications by Dr. Faxon (p. 233), through

*Science, N. S., III., 359–367, March 6, 1896.