President Noble, Dr. H. S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching; Dr. Elmer E. Brown, U. S. commissioner of education; Dr. Ira Remsen, president of the Johns Hopkins University and Mr. John E. Semmes, president of the Baltimore school commissioners.

DR. FRANK L. MCVEY has been elected president of the University of North Dakota. He was formerly professor of economics at the University of Minnesota and is now chairman to the tax commission of the state.

THE trustees of Columbia University have appointed Dr. William G. MacCallum, professor of pathological physiology in the Johns Hopkins University, to be professor of pathology in succession to Dr. T. Mitchell Prudden, who will retire from active service on July 1 next. At the same time the trustees have made provision for the development and extension of the departments of bacteriology under professor Philip H. Hiss, Jr., and of clinical pathology under Professor Francis C. Wood. Increased attention will be paid by these departments to the needs of advanced students and investigators.

AT the College of the City of New York, Dayton J. Edwards has been appointed tutor in natural history. He is a graduate of the University of Maine, and has lately been an assistant at Columbia University.

MR. G. H. COX has been appointed instructor at the University of California in geology and mineralogy.

DISCUSSION AND CORRESPONDENCE

EDUCATION AND THE TRADES

TO THE EDITOR OF SCIENCE: In your issue for November 14 Mr. William Kent asks a question which interests me greatly and which, although I can not answer, I believe I can lay down the lines along which the answer must be made.

In the first place, I wish to express my unqualified approval of the letter of Stella V. Kellerman in your issue of November 13, with which Mr. Kent expresses agreement, but which causes him to ask the question referred to. Latin, Greek and the mathematics have been taught for so many centuries that we have learned how to get out of them the highest possible degree of pedagogic value. This merely means that we have learned how, by means of studies of this character, to get hard work out of the student, while at the same time we maintain his interest. I assume that the pedagogic value of a study is largely comprehended in the possibility of teaching in the manner above mentioned. A great many people who honestly believe that our system of education should take more account of the daily affairs of life fear that when we replace any of the old studies by new ones which relate to modern industries, the work of the schools will lose its pedagogic value. Speaking in a general way, I believe this will be true, but this is not because the new studies do not have this value in them, but because we have not yet learned how to get it out of them. I believe there are some things which have higher pedagogic value than anything taught in our schools to-day, else why is it that with only 29 per cent. of our population actually living on the farm, with miserably poor school facilities as compared with our city population, this 29 per cent. furnishes about 70 per cent. of the leaders in every phase of activity in this country?

The point I wish to make is further illustrated by an instance that occurred in connection with the school garden work in Washington city schools. The teacher in charge had found difficulty in getting boys twelve to fifteen years old to lay off the plats properly. Two little boys, six and eight years old, from the hills of Virginia, came into school, never having seen plats laid off, but it was found that even the younger of these, if put in charge of a squad of boys twice his age, would have the work done according to directions. This greatly puzzled the teacher, and she asked me to explain it. I gave as an explanation the fact that these two small boys had enjoyed better pedagogical advantages than the others. But the teacher thought this im-

possible, as the smaller one had been to school only one year, and that in a little log cabin up in the hills. But when I called her attention to the fact that these boys had lived on a farm where they had been taught to assume responsibility and to do things, she agreed with my explanation.

I believe that it is the pedagogical value of farm work and the chance of placing responsibility on the child that has more than anything else to do with the development of efficiency and character in farm children, and this accounts for the fact that 29 per cent. of our population on the farms furnishes 70 per cent. of the efficient men in this country.

We have much yet to do before we understand the whole of this question. I believe, however, it is possible to outline a course which shall deal directly with the industries of our people and which will not only better fit pupils for their life's work, but will even fit them for college better than the best of our present high schools. We all recognize that because of our ignorance of the real principles involved in training the young mind, a lot of experimenting must be done before we have arrived at a final solution of this important question. The criticism I have to make of our school system is that we have neglected these essential experiments. It is high time that earnest effort be made in this direction.

W. J. Spillman
U. S. Department of Agriculture

The Simple vs. the Complex in Scientific Theories

There seems to be a growing feeling that our present hypotheses concerning the structure of matter, and its relation to electricity, are becoming unsatisfactory. The reason for this is the increasing complexity of the phenomena, as we see them, and of the corresponding explanations which this involves. This feeling does not seem to be well founded. A former cave dweller, who has been for a few thousand years an inhabitant of some of the regions which Dante has described, would find our modern life an array of very complex phenomena.

He would observe that empty apartment houses attract homeless families. He would learn that this could not be accounted for by Newton's law of gravitation, although gravitational attraction between houses and people certainly does exist. He might feel inclined to give up Newton's law, because it does not explain all attractions. He finally learns that ether waves are involved in this phenomenon. The people must see the house before it can have any attraction for them. He would learn that the architecture of the house really appeals to the minds of these people. Being something of a philosopher, he constructs a mental field of force, which lays hold of the building and its surroundings, and which proceeds from the conscious beings. He is greatly interested in seeing that people appear very much alike, while houses differ very greatly in construction, in material and in mass.

As he has not yet learned anything about electrical and kindred phenomena, our visitor may be excused if he refers to the people as negative electrons or ions, and to empty houses as positive ions. When a house contains families enough, so that it ceases to have any attractions for more, he calls the combination an atom. He observes that more people can be forced into a house already normally filled, but the motive forces must come from some external source.

He finally learns that a family which has been more or less forcibly ionized, and is about to enter a new home, must deliver to its former occupant and owner, the value-equivalent of a certain number of foot-pounds of mechanical work previously done. The value-equivalent of this mechanical work may exist in the form of a certain number of grams of some valuable substance which is actually delivered. The value to be transferred may also exist potentially in the form of credit at a bank. The transfer of this value may then be effected by entries in the books of the bank, which transfer credits from one customer to another.

By the time our visitor has learned all these well-known things, it would appear that he