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than last year. Clover (for hay) acreage 6.3 per cent. less and sugar cane acreage 0.4 per cent. more than last year.

UNIVERSITY AND EDUCATIONAL NEWS

THE Harvard Medical School has been bequeathed \$22,000 by the will of the late Professor Samuel Hubbard Scudder, the eminent entomologist.

GOVERNOR DIX has signed a bill that appropriates \$235,000 for the state colleges of Cornell University. The Veterinary College receives \$140,000 for a new building and \$50,000 is appropriated for a heating plant. This bill is independent of the annual bill for maintenance, which has not yet been passed.

At the Bryn Mawr College commencement announcement was made of a bequest of \$150,000 from Phoebe Anna Thorne, of New York, who died in 1909, to endow an associate professorship of education and the Phoebe Anna Thorne Model School to be conducted by the college as an experimental high school in connection with a graduate school of education.

COLUMBIA UNIVERSITY has received a gift of \$10,000 annually for five years from Mr. Charles H. Davis, C.E. ('87), for the support of advanced instruction in highway engineering and Professor Arthur H. Blanchard, of Brown University, has been appointed professor of highway engineering. Among other gifts announced are \$45,000 from the committee appointed to raise the Richard Watson Gilder Memorial Fund to establish the Gilder fellowships in good citizenship; \$33,133 from the committee appointed to raise the William T. Bull Memorial Fund, to establish a fund for research in surgery, and \$20,000 from an anonymous donor for the equipment of the research laboratories in electro-mechanics.

DR. EUGENE A. NOBLE, president of Goucher College, has been elected president of Dickinson College.

MISS ELLEN FITZ PENDLETON, dean, acting-president and associate professor of mathematics of Wellesley College, has been elected president of the institution.

DR. MICHAEL I. PUPIN, professor of electro-mechanics in Columbia University, has been

designated to serve as director of the Phoenix Research Laboratories. In this capacity, Professor Pupin will be in general charge of the development of the research work in the department of physics.

IN the School of Education of the University of Pittsburgh the following appointments have been made: Henry Davidson Sheldon, dean of the School of Education in the University of Oregon, has been made professor of the history of education. Dr. Sheldon will spend next year in Europe on leave of absence and will take up his work in Pittsburgh in the fall of 1912. Charles Barr Robertson, director of the schools of practise and professor of psychology and education in the Cortland, N. Y., State Normal School, has been called to the professorship of secondary education, and will organize and direct the practise teaching and the cooperative relations of the high schools and the university.

THE Johnston scholarships, of the Johns Hopkins University, "offered primarily to young men who have given evidence of the power of independent research," have been awarded by Johns Hopkins for 1911-12 to James Ryals Conner, Ph.D., in mathematics; Franklin Edgerton, Ph.D., in Sanskrit, and Joseph T. Singewald, Jr., Ph.D., in geology. The Adam T. Bruce fellowships, bestowed upon candidates who are considered "most likely to promote biological science, and especially animal morphology, by original research," have been awarded to Elmer J. Lund, Ph.B., in botany, and David H. Tenent, Ph.D., in zoology.

DR. FREDERICK P. LORD, of Iowa City, formerly connected with the department of anatomy of the State University of Iowa, has been appointed as the head of the department of anatomy of Dartmouth Medical School.

DR. J. F. SHEPARD has been promoted from instructor to assistant professor of psychology at the University of Michigan.

A NEW chair of machine design has been created in the engineering department of the University of Michigan, to which Professor Woldenburg, of Charlottenburg, Germany, has been appointed.

MR. ROBERT NEWSTEAD, lecturer in economic entomology and parasitology in the Liverpool School of Tropical Medicine, has been appointed to the newly-established Dutton Memorial chair of entomology in the University of Liverpool.

DISCUSSION AND CORRESPONDENCE

VITALISM AND EXPERIMENTAL INVESTIGATION

IN connection with the recent helpful discussions of vitalism by Ritter¹ and Lovejoy,² one point seems worthy of further emphasis. Some men are interested in science because of its bearing on general philosophical problems; others are interested in philosophical problems because of their bearing on the way to go to work in science. Both attitudes are proper enough; but one's treatment of such a question as vitalism is largely determined by which of these attitudes he takes. The point I wish to emphasize arises from the second attitude. Has vitalism (in any of the brands set forth by Lovejoy) any bearing on the theory and practise of scientific investigation?

This is a practical question in which the experimentalist as such must be interested, even though he may pride himself on his indifference to philosophical speculation. One kind of vitalism appears to me to affect fundamentally the theory of scientific work; for this reason this kind appears of more interest than the other, if not the only kind worth distinguishing.

The man of science at work with his two hands is trying to find the determining conditions for what takes place in matter and energy, and how these conditions act. In so doing he is led to make a study of the various possible methods of work, and particularly of the various ideas and devices that are presented to him as deserving consideration in his work. Many such things come to the worker in biology from outside his own special field; particularly from physics and chemistry. Such were the theories of electric dissociation; much in the physics of colloids, and the like. The biologist is compelled to examine these to see how useful they are in his own experi-

mental analysis; often he finds them of the greatest value, and he modifies his methods of work accordingly.

Various theories of vitalism have likewise been brought to the attention of the investigator, but as a rule he has taken little interest in these, because they seemed of such a nature as not to affect his work; they seemed merely general suggestions and reflections on the fundamental meaning of what one sees in biology, of interest primarily to the man for whom science is the handmaid of philosophy, rather than the reverse. They did not attempt to provide an instrument for actual use in experimentation, nor an idea according to which scientific practise must be altered.

This appears to be the case with the first kind of vitalism distinguished by Lovejoy; a vitalism which holds that there are new modes of action in living things, but that the new modes of action are nevertheless functions of the configuration of the matter and energy involved, so that after we have discovered how a given physical configuration acts, we can depend upon it, as we depend upon such constancy in the inorganic sciences. Such a vitalism involves no fundamental change in our methods of work; we continue to test, by fitting methods, how given configurations act, and to record the results in proper generalizations, exactly as in physics and chemistry. Biology would then, so far as scientific method is concerned, bear the same relation to physics and chemistry that any unexplored part of these sciences bears to the explored parts. The distinction between vitalistic science and physical science would have but a very mild interest for the worker with his hands; it has no pragmatic bearings.

On the other hand, the second kind of vitalism distinguished by Lovejoy makes assertions which would if true require serious consideration in actual practise; indeed, it is put forward by its advocates as supplying certain factors which require consideration on the same grounds as do electric dissociation and osmotic pressure; factors without which our experimental analysis is bound to be incomplete or wrong. Its acceptance would logically

¹ SCIENCE, March 24, 1911.

² SCIENCE, April 21, 1911.