the present plan, Dean A. R. Mann has the aid of three vice-officers as executives in the three main branches of the work of the college; resident instruction, extension, and research.

THE geological department of the New York State Museum will send into the field this year a considerable corps of workers for the purpose of collecting the fossil terrestrial plants of the Devonian Period. The collections of the museum are already very rich in such plant material, but it has all been acquired incidentally to the study of the fossil faunas of the state, and the reports of the museum have given inadequate attention to this important field. The physical conditions under which the Late Devonian deposits were laid down in New York were distinctly favorable to the accumulation of terrestrial plants in the shallow water offshore sands and shales, and it was said by Sir William Dawson that the state museum possessed a more extensive representation of this early land flora than was to be found elsewhere. The standing tree ferns found many years ago in the sands of Schoharie county and which are exhibited in the museum, are the oldest representatives of a terrestrial forest growing in place; the unique Archeosigillaria, 18 feet in length, is another extraordinary plant from this flora and these striking objects, supplemented by much unstudied material, give promise that the field may be opened to a more adequate knowledge of the first great land flora of the earth.

UNIVERSITY AND EDUCATIONAL NEWS

DR. FREDERICK CHARLES HICKS, Sinton professor of economics, has been elected president of the University of Cincinnati, succeeding Dr. Charles W. Dabney, who retires on reaching the age of sixty-five. Dr. Hicks went to the University of Cincinnati in 1900 as head of the department of economics, having previously taught in the University of Michigan and the University of Missouri.

MR. HOMER P. LATIMER, professor of anatomy at the University of Nebraska, has been granted leave of absence for the year 1920–21. He will spend this summer and next year in study at the Institute of Anatomy of the University of Minnesota. Mr. D. S. Brazda has been appointed instructor in anatomy to take charge of some of the classes during Professor Latimer's absence.

PROFESSOR S. ELIZABETH VON DUYNE, M.D., resident physician and professor of physiology and hygiene at Converse College, has resigned to accept a similar position at Goucher College, her alma mater.

DR. LINUS W. KLINE, formerly professor of psychology and education in the Duluth Normal School, who has been engaged in research at the Johns Hopkins University during the past year, has been appointed professor of psychology and education in Skidmore College.

DR. P. W. WHITING, in charge of biology at Franklin and Marshall College, Lancaster, Pa., has resigned to accept a position at St. Stephens' College, Annandale-on-Hudson, New York.

DR. RICHARD J. HARDING, McGill University, has been appointed professor of chemical pathology in the University of Toronto by the board of governors of the university.

DISCUSSION AND CORRESPONDENCE

SCIENTIFIC WORK IN THE HAWAIIAN ISLANDS

HAVING recently returned from a tour of the Hawaiian Islands, and having familiarized myself with the scientific work that is being done there and which remains to be done in the Islands to the south, I am particularly interested in the success of the Congress so ably planned by Professor Herbert E. Gregory, of Yale University, who is now resident in Honolulu as director of the Bernice Pauahi Bishop Museum.

While the problems presented by the Islands are chiefly in geology, volcanology, and anthropology, there is also a great deal of interest in various fields of zoology and oceanography.

The cooperation planned by Professor

Gregory is designed to extend to the scientific men of New Zealand and Australia, and to take into consideration the larger work of the future, particularly as suggested by the vanishing anthropology of Polynesia. Unless this work is begun immediately and carried through with great energy and system, it will not be done at all. The material in physical anthropology is disappearing with almost incredible rapidity. The ravages of influenza during the past two years have swept away a large part of the members of the Polynesian race. The survivors on certain of the Islands constitute a very small percentage of the original population.

Scientific cooperation has begun through the special research in physical anthropology of the Hawaiian group established between the Bishop Museum and the American Museum of Natural History. Dr. Louis R. Sullivan of the American Museum staff has already left for the Islands and will make as complete a survey as possible of the pure and mixed Hawaiian races among the remnants. These results will be published in the *Memoirs* of the Bishop Museum. It is expected also that Curator Clark Wissler will represent the American Museum at the Pan-Pacific Scientific Congress in August.

Henry Fairfield Osborn

THE ENERGY OF SMALL OSCILLATIONS

To the Editor of Science: The well-known theorem that in any linear harmonic oscillation the total energy is, on the average, half kinetic and half potential is so important in many fields that perhaps the following very simple and elementary proof will be of general interest. It can hardly be new, it is so simple and obvious, but at any rate it is not common, for it does not appear in any of the best known treatments which have been consulted.

Consider a particle of mass m which is displaced from its equilibrium position a distance x, and is vibrating in a circle. Then, as is well known, the kinetic energy is equal to the potential energy. For let the elastic restoring force be given by kx. We must then have $kx = mv^2/x$ for steady motion. The potential energy of the particle when at a distance x from the equilibrium position is equal to the work done in displacing it this distance, which equals the distance times the average force, which equals $1/2(kx)\cdot x$. Substituting the above value of kx we have for the potential energy $1/2mv^2$, and the proposition as stated is established. But any such circular vibration may be thought of as composed of two exactly similar linear harmonic oscillations. (When considering energy the phase difference and direction of oscillation is obviously irrelevant.) Therefore we must associate, on the average, half of the total kinetic and half of the total potential energy of the circular vibration with each of the linear vibrations. Since these are equal in the case of the circular vibration they must also be equal in the case of the linear vibration. The result is obviously perfectly general for any linear harmonic oscillation.

Warren Weaver
California Institute of Technology

CARBON DIOXIDE AND INCREASED CROP PRODUCTION

To the Editor of Science: Should one infer from Mr. Harrow's note in the latest issue of Science (May 7, 1920) that the question of "fertilizing" with carbon dioxide were not known to plant-physiologists and agricultural chemists in this country?

If so, it might be worth while to mention that for a number of years, at least for the last ten years, this topic has been the subject of many experiments in Europe, especially in Germany.

The botanists, Hugo Fischer and Adolf Hansen among others, have contributed much to its study. It has even found its place in modern German text-books of plant physiology —for instance in Molisch's "Pflanzenphysiologie"—and no doubt, also in those of agricultural chemistry, such as Schneidewind's "Ernährung der landwirtschaftlichen Kulturpflanzen."

M. W. Senstius