versity and the past five years a secretary of the General Education Board. Professor Tufts will be charged with the responsibility of the development of the enlarging educational program of the university. Mr. Arnett will perform the function of business manager upon the retirement of the present business manager, Wallace Heckman, next June.

DR. RUDOLF BENNITT, of Harvard University, has been appointed assistant professor of zoology at DePauw University. He takes the place of Dr. Walter N. Hess, who has been granted a leave of absence to accept the Johnston Scholarship in the department of zoology at the Johns Hopkins University.

DR. C. E. WEATHERBURN, of Ormond College, Melbourne, has been appointed professor of mathematics at Canterbury University College, Christchurch, New Zealand.

DISCUSSION AND CORRESPONDENCE

ON THE MODEL OF THE HELIUM ATOM

IN a recent paper[1] Kramers shows that the energy of the crossed orbit model of the helium atom in its normal state when computed on the basis of classical dynamics comes out too low, 5.5235 W (W = energy of the hydrogen atom in its normal state), while the best experimental value is 5.807 W. He concludes that classical dynamics fails in atomic systems containing more than one electron, an idea also confirmed by a theoretical investigation of the excited states of helium by Born and Heisenberg.[2] As a suitable modification of classical dynamics the assumption appears reasonable that the moving electrons of such systems, instead of acting gradually and continuously upon each other in the classical manner, interchange energy and momentum in a sudden discrete way. The nature and magnitude of these exchanges shall be found by demanding a correspondence between the discontinuous and the classical processes.

This idea when applied to the crossed orbit configuration of the helium atom leads to a model of the same general character as the classical one. The electrons each have half a quantum of moment of momentum along the normal of the invariable plane, and their motion in the meridian plane is an oscillation under the influence of the nucleus alone, with abrupt changes of momentum at the end points, the magnitude of which shall be determined from the correspondence requirement. The ionization potential of such a model was found to be 5.799 W. The most important question is whether this reasoning can be generalized and applied to other systems.

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1 *Zeit. für Physik,* 13 (1923), 312.
2 *Zeit. für Physik,* 16 (1923), 229.

PLANT LICE AND LIGHT EXPOSURE

BECAUSE the true sexes in plant lice generally make their appearance in the temperate zone in the fall, the generally accepted explanation has been that the approach of cold weather or temperature is the causal factor. Along with the decrease in temperature in the fall, there is a much more marked relative shortening of the days; and it is this relative length of day to which the insects are exposed that appears to stimulate the production of the sexes; just as Garner and Allard[1] have succeeded in making ordinary fall flowering plants blossom in summer or at any other season by the employment of a short day.

In Tennessee the normal appearance of the oviparous females of *Aphis forbesi,* the strawberry root louse, is in the month of November; but by subjecting the insects, a few days after the eggs hatched February 23, to a short day of seven and one half to eight hours, out of doors in a ventilated dark chamber, the oviparous females appeared May 7 and eggs were deposited May 22.

The method used of subjecting the plants to a short day was to place the potted strawberry plants with the lice in the dark chamber at 5 o'clock in the afternoon. The following morning the plants were removed at 9:30 and placed in the light. Garner and Allard have shown that the difference in temperature inside and outside the dark house in their experiments was negligible, as the temperature inside was but 2° or 3° F. higher than the temperature outside; hence any responses on the part of the plants could not be attributed to lower temperatures.

Having been successful in the production of the sexes by the employment of a short day, and since the fall migrants or sexuparae of various plant lice are the antecedents of the oviparous forms, it was thought possible that the migration of plant lice is also due to the relative length of daily light exposure. And such was found to be the case with several species. Males and sexuparae of *Aphis rumicis* L., *Capitophorous hippophaes* Koch. and *Aphis Sorbi* Kalt. were produced experimentally in June when the temperature is high by keeping curled dock (*Rumex crispis*), smartweed (*Polygonum sp.*) and plantain (*Plantago lanceolata*), the respective summer hosts of the above species, exposed to a short day for about seven weeks. There was also obtained some evidence, which will be published shortly, that the production of spring migrants in such forms as *Aphis Sorbi,* the destructive rosy apple aphis, where they may occur in any subsequent generation after the 3rd, is governed by the increasing length of day of the spring months. The late appearance in *A. Sorbi* of the spring migrants which may result in a destructive outbreak,

1 *Journal of Agricultural Research,* Volume 18: 553–606.

appears to be correlated with the length of day in relation to the time of hatching of the eggs.

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THE SANTA BARBARA SKULL

THE news items now being carried in SCIENCE Supplement are intended, of course, not for the specialist in the field to which they relate, but for those who may wish to keep in touch with the advance of science in general. This service is highly useful and is to be commended. However, by reason of the special object of the service, it becomes the more necessary that proper safeguards be thrown around these items to insure their essential accuracy. Signed articles written by specialists are judged on their merits. But with news items, it is expected that the information given either is uncontroverted or that the fact that it is controverted will be stated.

An item of news contained in SCIENCE Supplement of November 9, 1923, under the heading of "The Santa Barbara skull," departs so widely from the ideal standard of this service that it should not be allowed to pass unnoticed. The statements in question appear to have originated in the department of physical anthropology of the United States National Museum the name of Dr. Aleš Hrdlička of that department being mentioned. In this communication there is given as an item of news a categorical pronouncement as to the age of human remains found in America, and in addition an inaccurate statement as to one particular find of human remains. The antiquity of man in America is an extremely important matter to science, and at the present time is in controversy. Under these conditions it is not proper to circulate in *Science News Service* the opinion of one man, disregarding the opinion of all others who may be concerned with the same subject.

It is said in the news item under review that "the earliest human remains so far found in America date back only about three thousand years." Who, among those most experienced in reading time records, has examined the many finds of fossil man in America and determined this three thousand year limit? It is true that Hrdlička has reviewed the occurrence of early man in America. However, Hrdlička is a physical anthropologist and not a geologist, and the time element in this case is distinctly a geologic problem. Of course, those who choose to believe that man has been in America no more than three thousand years are privileged to do so. It is not, however, their privilege to circulate such opinions as unsigned items of news in a publication of the standing of *Science News Service*. Some others who have given attention to this subject have come to the conclusion that man has been on this continent for a very long period of time.

It is also said in the communication referred to that "in 1916, near Vero, Florida, remains were found which for a time were thought to be those of a very primitive type of human remains." This statement is incorrect; for while there was, and is, much difference of opinion as to the age of the Florida fossils, whether recent or Pleistocene, there has been no difference of opinion as to their character, no one having regarded them as primitive. The Vero human remains derive their particular interest from the fact that, although apparently structurally like modern man, they are there found in association with a considerable group of extinct species, including both plants and animals.

On the question of the method of interment of the Vero fossils, opinion is likewise divided. Hrdlička has been able to see in the remains only a human burial. On the other hand, others who examined the locality, including Berry, Chamberlin, Hay, MacCurdy and Sellards, found abundant and plain evidence in the geologic conditions to show that the human remains and artifacts were carried to their resting place by the stream and were a part of, and the same age as, the formation in which they were imbedded.[1]

In the case of the Vero find, Dr. Hrdlička, in advance of an examination of either the material or the locality, arrived at the conclusion that "both finds were seemingly burials."[2] Likewise in the case of the Santa Barbara skull an intimation of a conclusion in advance of the evidence is contained in the item published, in which it is stated that "anthropological experts of the Smithsonian Institution expect that scientific investigation by men trained in bone study will prove that the age of the supposedly primitive skull found at Santa Barbara, California, has been greatly overestimated."

The writer has no information on the Santa Barbara skull; it may prove to be recent. The present communication, therefore, is not a defense of that find, but is a protest against arriving at conclusions in advance of the evidence, and particularly against the use of *Science News Service* to spread propaganda favorable to certain particular views or theories.

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[1] "Symposium on the age and relations of the fossil human remains found at Vero, Florida." *Journal of Geology*, Vol. XXV, Nos. 1 and 4, 1917. For a list of publications relating to the Vero fossils, see *Amer. Journ. Sci.*; (4), Vol. XLVII, pp. 358–360, 1919, or Fla. State Geol. Surv., 10th An. Rpt., 1919.

[2] Personal communication to the writer, July 20, 1916.