sociate professor of entomology and chief of the department, writes that entomologists visiting the Philippines will be cordially welcomed to the laboratories and every facility for their comfort will be placed at their disposal.

Explorations being made in the Westhaver mounds six miles south of Circleville by Curator William C. Mills, of the Ohio Archeological and Historical Museum, the Ohio State University, have brought to light interesting relics of aboriginal burial mounds. This mound is 16 feet high and 100 feet in diameter, about 2,000 cubic feet of earth, and every inch must be carefully examined. A total of fifteen burials was found in the mound, four of them in graves below the surface or base of the mound, and the remainder in the mound proper. In many cases the skeletons were found to be lacking one or more bones, and in one case the skull alone was found. This was explained by Dr. Mills as indicating the custom of reburial, practised by the mound builders. At one point in the explorations a huge grave was opened, extending five feet below the base line. In the grave were found three skeletons, placed side by side—two adults and a child. The adults, probably a man and a woman, were almost six feet in height, while the third skeleton was that of a child perhaps seven years old. Dr. Mills and his party will spend most of the summer working in this mound.

UNIVERSITY AND EDUCATIONAL NEWS

Professor C. H. Eigenmann has been reappointed research professor in zoology, Indiana University, for the year 1915–16. He will devote his time to the study of South American freshwater fishes.

At the University of Michigan, Dr. Alexander G. Ruthven has been promoted to the position of professor of zoology. He will retain the directorship of the Museum of Zoology.

The following promotions and appointments have been made by the trustees and medical faculty of Western Reserve University: William Evans Brunner, A.M., M.D., clinical professor of ophthalmology, to be professor of ophthalmology, with seat and vote in the faculty. H. H. McGregor, Ph.D., to be instructor in biochemistry; C. D. Christie, A.B., M.D., demonstrator of medicine and medical resident of Western Reserve University and Lakeside Hospital, to be director of the Clinical Research Laboratory at Lakeside Hospital, and Russell J. Collins, A.B., M.D., to be demonstrator of pharmacology.

In the University of Nebraska School of Medicine, Dr. Max Morse becomes assistant professor of biological chemistry.

C. E. Howell, of the University of Missouri, and E. B. Kranz, of Iowa State College, have been appointed to the division of animal husbandry at the State College of Washington.

Dr. Johannes Thiele, professor of chemistry at Strassburg, has declined a call to succeed Professor Wallach at Göttingen, and Dr. Friedrich Paschen, professor of physics at Tübingen, has likewise declined to succeed Professor Riecke in the same institution.

DISCUSSION AND CORRESPONDENCE

CANCER AND HEREDITY

In Dr. Slye's recent communication[1] concerning the inheritance of cancer, reference is made by way of illustration to a type of color inheritance which, since it is quite contrary to the more generally accepted principles of Mendelian inheritance, requires critical comment.

On page 160 she states "Let me at this point recall some of the basic facts of heredity." She then proceeds, using the customary Mendelian terms "*dominant*" and "*recessive*," to describe a cross between *gray and albino mice*, and indicates results which are incompatible with those of other investigators. She furthermore furnishes no data in support of this more or less revolutionary hypothesis.

As Castle, Allen, Bateson, Durham, Cuénot, Plate, Davenport, and many others have carried on investigations on this particular problem in genetics and have reached results contrary to those obtained by Slye, it seems rea-

[1] Slye, Maud, "The Incidence and Inheritability of Spontaneous Cancer in Mice," *Jour. of Med. Research*, 1915, XXXII., 159.

sonable to demand a full presentation of her data on the inheritance of *albinism* in mice. In fact, a careful repetition of such work should be expected before her claims are to be accepted.

To those unfamiliar with the work of the geneticists above mentioned, Slye's paper might be taken as presenting the well-known principles of Mendelian inheritance. With a knowledge of the facts, however, it is obvious that the type of inheritance which she outlines has not been observed in similar material by any of the investigators above mentioned. That this discrepancy is not based on an oversight on the part of Miss Slye has been determined by personal correspondence.

C. C. LITTLE

HARVARD UNIVERSITY

RADIUM FERTILIZER

IN a recent number of SCIENCE[1] there appeared an article by Hopkins and Sachs of the University of Illinois on "Radium Fertilizer in Field Tests" in which they gave results of a series of tests where they used .01, .1 and 1 milligram of radium per acre. Their results showed that radium used in these amounts had no effect.

It is well known that radium is present in all substances in slight traces. I thought it of interest to calculate the amount of radium in one acre. The question immediately arises, What is the volume of an acre? For agricultural purposes I think that every one will agree that the soil should be at least 5 inches, 12½ centimeters, deep.

There are 43,560 square feet in one acre. This when reduced to square centimeters is approximately 40,000,000 or 4×10^7. This when multiplied by the depth, 12½ is 5×10^8 cubic centimeters. Taking Rutherford's average value for the amount of radium in the crust of the earth as 2×10^{-12} grams radium per gram of material,[2] and calling the density of the soil, which is about 1.2, unity, and then multiplying 5×10^8 by 2×10^{-12} we have 1×10^{-3} grams or 1 milligram of radium in an acre of soil.

Thus Hopkins and Sachs in using their maximum amount, 1 milligram, at a cost of $100 only doubled the amount of radium in the soil. A fertilizer is on the market which contains radium, .05 to .08 microgram, or 5 to 8×10^{-8} grams to the pound. The company recommends one pound of the fertilizer to fifty square feet of soil. Fifty square feet of soil, figured as above, contains about 5×10^{-7} grams of radium. Thus the average soil contains ten times as much as they recommend in their fertilizer.

Besides the radium in the soil we have the radium emanation, a gas which slowly rises through the soil from the interior of the earth. Experiments show that about $1{,}000 \times 10^{-12}$ curies of radium emanation issue from every square meter of the earth's surface in an hour. (A curie of emanation is the amount of emanation which is in equilibrium with one gram of radium, or the amount which will collect in a closed vessel in 30 days when the vessel contains one gram of radium.) Every square centimeter of the earth's surface gives off $.1 \times 10^{-12}$ curies per hour, or $.0003 \times 10^{-12}$ curies per second. One curie equals about 4.8×10^5 gram seconds. (A gram second is the amount of radium emanation given off by a gram of radium in a second.) Then $.0003 \times 10^{-12}$ curies equals about 150×10^{-12} gram seconds, or the amount of radium emanation which is continually given off by 150×10^{-12} grams of radium.

Thus the amount of radium emanation given off by the soil is 50 to 100 times as much as that which is given off by the radium in the upper five-inch layer of the soil.

To double the emanation in the soil one must use about 75 milligrams of radium per acre at a cost of $7,500 per acre.

R. R. RAMSEY

DEPARTMENT OF PHYSICS,
INDIANA UNIVERSITY

SUGAR-BEET MOSAIC

ALTHOUGH this disease of the sugar beet has been observed for more than a dozen years it

[1] Vol. 41, p. 732, May 14, 1915.

[2] "Rutherford Radioactive Substances and Their Radiations," p. 650.