determined by action of the trustees and the council.

The corporation of Yale University has approved a plan for inviting full professors of the university to meet with the corporation at luncheon from time to time during the academic year.

Plans for the celebration next June of the semi-centennial anniversary of the founding of the Worcester Polytechnic Institute are rapidly taking definite shape. A program drawn up by a sub-committee consisting of Mr. Rockwood, Mr. Baker and Professor Coombs has been adopted, and the committee of three has been constituted an executive committee to carry it through. The exercises will begin on Sunday, June 6, and close on Thursday, June 10.

A certain number of Belgian professors and a growing number of students from Louvain, Liége, Ghent and Brussels are now in Cambridge, and although it has proved impossible for the Louvain University to transfer its corporate and official existence to Cambridge, unofficial courses have been instituted, combining, as far as possible, systematic instruction on the lines of the Belgian universities with the individual requirements of refugee students. It is typical of the disastrous conditions in Europe that in view of the appeal issued by the Belgian government for volunteers, it has been decided, in consultation with the Belgian government, that only such students as are physically unfit for military service or have been rejected for other reasons by the Belgian authorities, and are in possession of a certificate to that effect, can be accepted by the hospitality and academic committees.

R. T. Burdick has been promoted to an assistant professorship of agronomy at the University of Vermont and the State Agricultural College at Burlington.

In the chemistry department of Wesleyan Universtiy: Dr. M. L. Crossley, professor of organic chemistry at William Jewell College until 1913 and lecturer in Wesleyan University, 1913–14, has been appointed associate professor and acting head of the department. Dr. H. Lee Ward has been appointed associate professor in the department.

James Murray, B.S.A., manager of the farm of the Canadian Wheat Lands, Limited, at Suffield, Alberta, has been appointed to the chair of cereal husbandry in Macdonald College, McGill University, in succession to Professor L. S. Klinck, who resigned on August 1, to accept the deanship of the College of Agriculture of the University of British Columbia. Mr. Murray was formerly (1906–1911) superintendent of the Dominion Experimental Farm at Brandon, Manitoba.

DISCUSSION AND CORRESPONDENCE

CAHOKIA MOUND

In this journal, August 28, 1914, Mr. A. R. Crook presented a brief note on the origin of Cahokia Mound. The communication is here quoted in full:

> A study of the materials composing the so-called Monks or Cahokia Mound, in Madison County, Ill., establishes, beyond doubt, that it is not of artificial origin, as has been so generally held, but that it is a remnant remaining after the erosion of the alluvial deposits, which at one time filled the valley of the Mississippi, in the locality known as the "Great American Bottoms."

For the benefit of those who may not be familiar with the subject, and for this reason may be misled, we desire to say the statement made by Mr. Crook is erroneous and without the slightest degree of reason, and his conclusion would apply equally well to the pyramids of Gizeh or the ruins of the valley of Mexico.

Cahokia, by reason of its magnitude and importance, has led many to discuss its probable origin. Three theories have been advanced: (1) It is the belief of some that Cahokia is a natural formation. (2) Others regard the lower part natural and the upper part artificial. (3) Some, acknowledging it to be the work of man, believe it to have been erected at a period when the Mississippi flowed between it and the line of bluffs to the eastward, thus placing the mound on the right bank of the stream. However, no one of the

various hypotheses is compatible with existing facts and conditions, and there is no just or plausible reason why Cahokia should be considered other than the work of man, erected after the Mississippi had reached its present channel. True at some time in the past the waters of the Mississippi reached the foot of the bluffs now forming the eastern boundary of the wide lowland upon which the mounds stand. The waters gradually wore away the western bank of the stream until masses of limestone, now forming the cliffs on the Missouri side, were reached. Here a new and permanent channel was formed, and so it has remained until the present time. The entire area between the eastern line of bluffs and the limestone on the west was scoured by the advancing waters, and no single mass of the loose formation could have withstood the elements and thus remained an isolated mound near the center of the plain. The lowland was formed by the gradual shifting of the channel from the east to the west; this movement continued until it was arrested by the resistant limestone. Cahokia stands upon the lowland about midway between the two lines of bluffs. This area was reduced to its present level by erosion, during the time the stream was moving from the east and seeking its present bed. Therefore it would have been a physical impossibility for the mounds, standing at the present time, to have been erected at a time when the waters of the Mississippi flowed along the foot of the bluffs to the eastward.

Some five years ago Mr. N. M. Fenneman in "Physiography of the St. Louis Area," Bulletin 12, Illinois State Geological Survey, wrote (p. 63):

> The partly artificial character of Monks' Mound is evident from its form. That it is in part a natural feature is seen by its structure. Sand is found neatly inter-stratified with loam at an altitude of about 455 feet, or 35 feet above its base. To this height, at least, the mound is natural and as there is sufficient other evidence that the valley was filled in the Wisconsin epoch to at least that height, the original mound may be regarded as a remnant of the alluvial formation of that time. Its base was probably narrowed artificially by the removal of material which was carried to the top. In this way also the conspicuous abruptness of its slopes was probably produced. No natural stratification has yet been found more than 35 feet above its base and therefore, for aught that is now known, more than half its height may be artificial.

The discovery of a mass of sand in the body of the mound does not prove the lower part of the structure to be of natural origin. The sand is mentioned as being "neatly interstratified with loam," but no statement appears as to the extent of the stratum. Was it found exposed on all sides of the work or only at one point? Probably the latter.

Of the great number of artificial mounds which have been examined few, if any, have been a homogeneous mass. Distinct strata of sand, clay, charcoal and ashes, vegetal mold or other materials, occur in the mounds. In some small deposits of clay, of sand and of black soil are in close contact, each mass being the quantity that could have been easily carried by one person. During the construction of the mounds many persons were necessarily engaged. The earth or sand was carried in bags or baskets from the chosen area and gradually the mass accumulated and the mound was formed. If a natural deposit of sand was encountered by the builders on one side of the work, while loam was being carried from another point, the result would be a pocket of sand in the artificial work. This may explain the occurrence of sand "neatly inter-stratified with loam," as mentioned by Mr. Fenneman. This question will be more clearly understood by referring to the writings of Mr. C. B. Moore, in which he describes the structure of many mounds excavated by him throughout the southern states, and likewise to the Twelfth Annual Report of the Bureau of Ethnology.

One illustration in Mr. Fenneman's work deserves mention, Fig. B, Pl. 6. This shows three mounds directly south of Cahokia and bears the legend:

> Group of Mounds one half mile south of Monks' Mound. The low grassy knoll at the left is believed to be entirely natural. It suggests the original forms of the larger mounds which have been artificially shaped.

This conclusion proves the fallacy of Mr. Fenneman's argument, for although the two large mounds represented in the illustration have never been touched by the plow, the surface of the "low grassy knoll at the left" has been cultivated for many years, since early in the last century, and consequently its height has been reduced many feet. A sketch of the group made about the year 1840 and reproduced in "The Valley of the Mississippi," No. 3, September, 1841, shows the mounds to have been at that time of approximately the same height, therefore the "grassy knoll" was at one time thirty feet or more in height, and it is known that during the course of its destruction human remains were revealed by the plough.

Cahokia, the subject of this discussion, is the largest artificial earthwork in the United States. It stands in the extreme southern part of Madison County, Illinois, about six miles east of the Mississippi. It is in form a truncated rectangular pyramid, rising to a height of one hundred feet above the surrounding plain. Its base, rectangular in form, covers an area of about sixteen acres and measures 1,080 feet from north to south and 710 feet from east to west. Surrounding Cahokia are 69 lesser mounds, some of which are more than 40 feet in height. Some are circular, others rectangular; the latter, including Cahokia, are placed with their sides toward the cardinal points. A group of smaller mounds stood near the bank of the Mississippi a little south of west of the main group; between the two were several isolated mounds serving to connect the groups. On the opposite side of the river, on the summit of the ridge a short distance from the river, stood a group of 26 mounds, all of which have long since disappeared. These were within the limits of St. Louis.

As is generally known to those who are familiar with the distribution of mounds in the southern part of the country, there usually occurs in every group one mound which is larger and more imposing than the others. Often the larger work is separated from the main group by an open space, again it is more closely associated with the lesser mounds, sometimes being surrounded by them. The St. Louis group belonged to the former class; the larger group, with Cahokia near its center, belongs to the latter. The mounds of the St. Louis group, and those which formerly stood on the opposite side of the Mississippi, have disappeared, and many of the lesser works of the main Cahokia group have been practically obliterated by the plow. In view of these conditions it is gratifying to know that a movement is now being made to have Congress purchase, and set apart as a park, an area of sufficient size to include Cahokia and certain of the smaller mounds which have escaped destruction. This would preserve the largest earthwork in America, the most imposing aboriginal monument east of the Mississippi. It is quite evident that Mr. A. R. Crook, of Springfield, Ill., is antagonistic to this movement, but such statements as those recently made by him should not be allowed to influence the work now being done.

David I. Bushnell, Jr.
University, Virginia

An Examination of Blood-Ejecting Horned Lizards

The horned lizard's (or horned "toad's") remarkable habit of ejecting blood from its eye when attacked, although well authenticated, is so rarely observed that it is thought by many to have its origin and its creditability in the little animal's dragon-like appearance. Even Ditmars confesses that it took an actual demonstration, witnessed only after handling several hundred specimens, to upset his scepticism. His description of the performance is well known.[1]

Hay (1892), Stejneger (1893), Van Denburg (1897), Brunner (1907), Bryant (1911) and others have observed and mentioned this peculiar habit. It is not limited to any single species.

Various explanations have been suggested; among others that the phenomenon is connected with the breeding season, that it may be due to some parasite, and that it may be "a secondary use acquired by a relatively few forms."

[1] "The Reptile Book," p. 145.