from a large plate with deep radial flutings and the other, smaller, with similar markings. Both are evidently Stegocephalian.

7. A large vertebral centrum, evidently from a sterospondylus Stegocephalian.

Most of the bones were found in the conglomerate beds, but a few in lenses of impure limestone.

Lee and Girty also give a description of the beds near the Mesa del Yeso on the eastern side of the Valle del Ojo de la Parida and report typical Manzano fossils from the Yeso formation.

The Red Beds were examined by the writer near the Ojo de la Parida about ten miles northeast of Socorro, where the Abo, Yeso and San Andreas formations are easily recognized. In the Yeso and the upper part of the Abo no vertebrate fossils were found, but in the lower part of the beds near the mouth of the Canyoncito Colorado (see the Socorro topographic sheet) beds of dark red pebble conglomerate were found lying upon green, blue and drab shales which show in the bed of the arroyo. In this conglomerate were found typical Permo-Carboniferous bones such as were collected by Dr. Williston and the writer in Rio Arribo County, New Mexico. The following list shows the similarity:

1. A complete femur of *Eryops* sp.
2. The distal end of a clavicle of *Eryops* sp.
3. The distal end of a neural spine of *Eryops* sp.
4. A femur of *Sphenacodon.*
5. A fragment of the jaw with four teeth of *Sphenacodon.*
6. The distal end of the scapula of a *Sphenacodon* or *Ophiacodon.*
7. The distal end of a large scapula, possibly *Sphenacodon.*
8. Fragments of a large pelvis, possibly *Sphenacodon.*
9. In the bluish shale in the bank of arroyo, the proximal end of a rib of diadectid type associated with poorly preserved plant remains.
10. In the drab shale below the blue, several invertebrates.

The discovery of this fauna below the San Andreas limestone adds one more bit of evidence to those already cited by the author elsewhere, for the very early appearance of specialized reptilian life in North America.

E. C. CASE

THE SWEET POTATO "SOIL ROT" OR "POX" ORGANISM[1]

SINCE Halstead in 1891 published his results on the study of "Soil Rot" of sweet potatoes, which he credited to a fungus "*Acrocystis batatas,*" little positive work seems to have been done on the causative organism. During the present season observations by the author of slimy masses on the surface of roots developing large shallow "pox" marks, led to the discovery that the disease is due to a plasmodium and that there are two modes of infection. One is by the plasmodium as a whole, causing large shallow pits; the second is by means of swarm spores, which enter the growing-points of stems or roots and cause the formation of deep circular pits, when the infection reaches the main root. The swarm spores first entering a growing-point go through a rapid development in the outer host cells, passing through an ameboid and a plasmodial stage. During the plasmodial stage a large number of nuclei are formed by mitotic division. The plasmodium then forms a heavy-walled cyst in which hundreds of spores are developed. The swarm spores are liberated within the cyst, which breaks down and releases the spores, when a further infection of host cells occurs. The infection spreads rapidly to the main root, causing a pit or "pox" scar. When the pit has reached the limit of its development the plasmodium assembles and breaks out, migrating into the soil. A secondary infection by swarm spores in small immature pits, causing extensive blister-like elevations in the skin of stored sweet potatoes, has been observed. White potatoes are also subject to the disease.

The formation of a heavy-walled cyst containing several hundred swarm spores separates this plasmodium from the now-recognized genera of the Plasmodiophorales. Accordingly, the name *Cystospora batata* gen.

[1] A preliminary note.

nov., sp. nov. is proposed for this new organism. A more complete description of the organism and the histology of the disease will be published shortly. John A. Elliott

Delaware College Experiment Station,
September 18, 1916

THE SYNCHRONAL FLASHING OF FIREFLIES

In Science for February 4, 1916, E. S. Morse, under the title, "Fireflies Flashing in Unison," mentions having seen fifty years before a striking instance of the synchronal flashing of fireflies. Morse again discusses briefly the same subject in Science for September 15, 1916. He states that he has never since observed this phenomenon in the flashing of these insects. McDermott, in Science for October 27, 1916, also discusses the question of fireflies flashing in unison.

The synchronal flashing of fireflies appears to be a very rare phenomenon in North America. So rarely does it seem to occur that one may consider himself fortunate if he has observed the phenomenon even once in a lifetime. The writer about twelve years ago observed a most remarkable instance of the simultaneous flashing of fireflies in Oxford, Mass. On the night this phenomenon occurred a heavy thunderstorm had recently passed over, followed by a profound calm. From time to time dazzling flashes of lightning illuminated the landscape. The air was very warm and humid, and fireflies became unusually abundant and active, especially in a low field adjoining some woods. Here thousands of these insects were sailing low over the ground, flashing incessantly as far as the eye could see. After a while a most remarkable synchronism in the flashing appeared to take place. From time to time, as if moved by a common impulse, great numbers would flash so closely in unison over the entire field that an extensive sheet of tiny light-points would gleam upon the vision for a moment—and then vanish. This remarkable synchronism in the flashing sometimes continued several times in succession, giving one the impression of alternate waves of illumination and darkness in the distance. At times the rhythmic impulse ceased for a considerable period over the entire field. At other times it appeared to take place only in large groups occupying particular areas of the field. Although the writer has given a great deal of attention to the flashing of fireflies during the last twelve years, synchronism in the flashing of these insects has never since been observed. Depending more or less upon atmospheric conditions, fireflies show considerable variation in the character of their flight and the flashing impulse. At times the insects seem loath to leave the low herbage. On certain evenings they appear to confine their flight over the fields largely to the lowermost stratum of the atmosphere; at other times they rise upward in myriads from the grass early in the evening and drift away in all directions toward the crowns of the trees. At such times the upward flight is frequently accompanied by a weak, prolonged emission of light so that the insects appear to be tiny, glowing sparks propelled upward by gentle air currents.

H. A. Allard

Washington, D. C.

QUOTATIONS

THE NEWCASTLE MEETING OF THE BRITISH ASSOCIATION

For the third time the British Association has held its annual meeting during the great war. There are some obvious reasons for suspending such meetings, to which brief reference has already been made on the previous occasions, and to which has been since added the further restriction of available members by the adoption of universal service. But there are also good reasons for "carrying on," the best of them being provided by experience. The meetings have been eminently successful, if success is properly gauged with due account taken of the difficulties. In using the word it is not implied that the numbers present were large compared with the average numbers in peace time: at Newcastle the tickets sold were indisputably below that average—even much below it: we must think rather of what might have been, under the deplorable circumstances. The sections might have been empty, whereas they were well attended, in