spring migrations of the birds and may well represent the same type of response.

The annual migrations of the Southern Cabbage butterfly (*Pieris monuste*) are, on the other hand, apparently just the reverse of this, as the immense swarms of this species travel southward down the east coast of Florida at the same time that the bobolink is leaving for the north.

The migration of the present season has been exceptionally heavy and has attracted a great deal of attention. Every automobile passing up or down the coast has emerged from the swarms with its radiator plastered with the butterflies, often to such an extent that heated engines were common and even bearings burned out. Stirling, in the *Florida Entomologist,* records a similarly heavy flight in 1923 and stated that it was an annual occurrence. Other observers have encountered these swarms every year since that time.

The present swarm was reported as between Jacksonville and St. Augustine on May 10. By May 20 it had moved more than one hundred miles south and at that time extended from New Smyrna to Ft. Pierce, a distance of one hundred and twenty-five miles. At present (June 20) the swarm is reported along the coast south of Miami, a movement of about two hundred miles in the month. On May 20 the writers drove through the swarm for eighty-five miles along the coast and then turned westward at right angles and drove thirty miles to Sanford. On the westward trip butterflies were counted crossing the road at the rate of six per mile or two hundred per hour. They were flying almost due south against a light breeze. In the first few miles from the coast the numbers were greater and they were flying southeast, swinging more to the east as they approached the coast. Along the shores of the Indian River they swung southward again, concentrating into a definite swarm only a few hundred yards in width and in passing obstructions narrowing to fifty yards or less. They were flying low, two to six or rarely eight feet in height and at the rate of six or eight miles per hour *against* a light wind. At Fort Pierce two hundred per minute were leaving a field one hundred yards wide. They flew about eight hours that day, which would give a total of one hundred thousand per day passing over an area that wide.

The writers observed that, although the swarm as a whole was moving down the shore, a constant procession of butterflies were striking out across the water to the southeast. Stirling records that from June 9 to 11, 1923, passengers on vessels plying between Nassau and the mainland observed millions of butterflies winging their way southward over the gulf stream. From these observations it would seem that the swarms noted along the coast are not continuously moving bodies but only a temporary piling up of individuals that are later to strike out over the water.

Where these butterflies come from and where they go are still mysteries but a still greater mystery is the force or impulse back of the movement that sends them in a reverse direction from ordinary migratory activity. Before we can hope to interpret this latter force we must have much more information as to the scope of the movement itself, and the present note is submitted in the hope that those who have further information will record it as soon as possible.

E. D. BALL,
W. E. STONE

ENTOMOLOGICAL LABORATORY,
SANFORD, FLA.

OBSERVATIONS ON PARTURITION IN THE OPOSSUM DIDELPHYS VIRGINIANA

IT was my good fortune, recently, to observe an opossum embryo during its migration from the vulva to the marsupium. Since, to date, there have been published only three accounts of the manner of birth of a marsupial it seems worth while to record these observations. The female opossum observed in this instance was of medium size and of a type popularly known to hunters as the "black-legged" opossum. She was captured near Charlottesville, Va., February 24, 1928, in a trap set beside the decaying carcass of a cat.

When I first saw her—at a distance of about fifty feet—she was sitting quietly by the trap watching me approach and made no move to escape or to "play 'possum," as these animals frequently do. On picking up the animal by the tail and releasing it from the trap, I noticed a greenish mucous discharge around the vulva. Further investigation revealed an embryo clinging to the mother's fur, having traversed about two thirds of the distance from the vulva to the opening of the pouch. I showed the animal to my wife, who also saw the wriggling bit of life making its way over a very difficult and treacherous trail. A few minutes later Mr. Paul R. Burch observed the foetus just entering the pouch. The entire interval from my first observation of the embryo until Mr. Burch and I watched it squirming its way into the pouch could not have exceeded twenty minutes. I feel sure that ten minutes is a more nearly accurate estimate. During all this time the mother was carried suspended by the tail and made no effort to aid the little one on its journey. Although I examined carefully the ground around the trap, I found no evidence that a foetus had failed to reach the pouch.

The movements of the opossum embryo are adequately described by Carl G. Hartman.[1] My observations, although more limited, corroborate his account of the birth of the opossum's young. It is an interesting point to note that in this instance the hind limbs of the foetus were comparatively inactive.

There were thirteen young in the pouch of this animal. Dr. H. E. Jordan determined the greatest length (in this instance the vertex-breech distance) of seven of the embryos to be as follows:

Number of embryos	Greatest length
2	10 mm
2	11 "
1	11.5 "
2	12 "

L. M. DICKERSON
MILLER SCHOOL OF BIOLOGY AND THE
BLANDY EXPERIMENTAL FARM,
UNIVERSITY OF VIRGINIA

A NEW RHIZOPUS ROT OF RUTABAGA

IN November, 1927, the junior author found in one of the Evanston fruit and vegetable stores a number of bushels of rutabagas heavily infected with Rhizopus. The rot produced is a typical wet rot such as is produced by other species of Rhizopus, but it works slowly as compared with *Rhizopus nigricans* Ehrb. For example, where *R. nigricans* produces a wet rot in three days, the new Rhizopus requires six days. Inoculation experiments have shown the latter to produce a typical rot in carrot, cucumber, eggplant, green pepper, Hubbard squash, onion, pumpkin, sweet-potato and tomato.

The fungus, when studied in pure culture, proved to be an undescribed species and for it the name *Rhizopus fusiformis* sp. nov. is proposed.

Rhizopus fusiformis sp. nov.

Forming on bread at first a white, cottony mycelium, becoming in age a loose, light gray turf 0.5–1.5 cm high. Sporangiophores 1–2 mm tall, 13.5–17 μ in diameter, trailing, irregularly branched in umbels of two to six sporangiophores, sometimes again branched with a fusiform swelling immediately below the insertion of the branches, some of which may end in sporangia. Sporangia but sparsely developed, globose, 70–113 μ in diameter, with deliquescent wall. Columella spherical, 30–65 μ in diameter. Spores angularly subglobose to suboval, pale gray, smooth, 5–7 x 3.5–7 μ. Zygospores not found.

Isolated from rutabagas rotting in an Evanston store.

Rhizopus fusiformis Dawson and Povah is characterized by its cottony mycelium, its sparse production of sporangia and its branched sporangiophores with a fusiform swelling at the base of the insertion of the branches. It resembles *R. nodosus* Namysl. in the production of swellings on the mycelium, but differs from it in the shape and location of the swellings. In the mode of branching, it recalls *R. arrhizus* Fischer, but differs from it in the size of the sporangia and the production of swellings.

MARION L. DAWSON
ALFRED H. POVAH
NORTHWESTERN UNIVERSITY,
EVANSTON, ILLINOIS

[1] *Anatomical Record*, Vol. 19, 1920, p. 256.

WHAT DRAWS MEN INTO GEOLOGY?

DR. GEORGE H. ASHLEY,[1] in discussing the present standing of geology, writes, "To the world at large, geology has taken a back seat." The remedy he proposes is largely that of presenting geology in a more popular and palatable form to the general public. This is a most desirable aim; but, to the writer, another serious phase of the problem is to attract to geology the ablest type of student. Recently, the late Professor Nathaniel Shaler's course in geology at Harvard has been cited, by a leading educator of Columbia University, as an example of what an "easy" course might lead to in attracting large numbers of students and in stimulating many able men to take up geology as their life work. Professor Shaler's enthusiasm certainly must have been contagious and his lectures stimulating. But were there not external cooperating factors to aid at that time in producing professional geologists? As Dr. Ashley has pointed out,

> The average man of culture fifty years ago had a better knowledge of these things (geological concepts) than the man of culture to-day. . . . We were a new country, and the men who explored this new country and told us of its mineral wealth loomed large in public affairs.

The United States Geological Survey, which dates its period of greatest growth from that time, then afforded opportunity for the employment and training of geologists and created a demand for them.

At the present time the University of British Columbia has an outstanding record in North America for the number of its graduates who have proceeded to advanced work in geology during the last few years. At my request, Dr. S. J. Schofield furnished me with a list of them, which shows that during the last six years twenty-seven graduates of British Co-

[1] "Geology and the World at Large." Address of the vice-president and chairman of Section G—Geology, American Association for the Advancement of Science, Nashville, 1927. SCIENCE, Vol. lxvii, 1928, pp. 22–24.