the preglacial Maumee, the preglacial Sandusky and Huron, the Teays and the preglacial or interglacial Miami and Little Miami, separated by divides, the major one, including the upland in Logan County, being the controlling feature. The Harrisburg peneplane may be represented by the highest bed-rock elevations in Logan County, and the Worthington erosion surface has a wide extension throughout the area. Lower areas, probably representing the Parker Strath, occur along the buried valleys. Beneath these are the deep, gorge-like valleys which represent the Deep Stage.

In the near future the writer expects to publish the complete results in a paper dealing with numerous details which are treated in a general way here.

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AUTOTOMY IN A PEREGRINE EARTHWORM

NUMEROUS caudal fragments of an unidentified earthworm that had been collected in a living condition from a golf green were submitted, in early June, 1935, to the authors by F. W. Poos, of the Bureau of Entomology and Plant Quarantine, of the United States Department of Agriculture. These fragments averaged 13 mm in length and consisted of from 15 to 23 of the caudal segments. They were reported by a greenskeeper as causing numerous castings on a putting green near Catonsville, Md. This green was investigated by the writers on July 11, a very warm day that succeeded a period when daily temperatures had remained well above 90° F. Numerous earthworm castings, many of them still wet and fresh, were visible on the green. The greenskeeper maintained that these castings were due to fragmentary worms similar to those previously described. Upon removal of a 2-foot square section of sod, however, many active yellowish brown earthworms, 6 inches or more long, were revealed, as well as live fragments of the same. Specimens of these submitted to Dr. Frank Smith at Hillsdale, Mich., elicited the advice that this worm belonged to the genus *Pheretima,* was doubtless a peregrine species and should be sent to Professor R. E. Gates, of Rangoon, Burma, for specific identification. It was at first supposed that the fragmentation observed might represent a habit of reproduction by fission, but a recent excellent work on the earthworms,[1] cited by Dr. Smith, furnished an explanation in what is known as "autonomy," a recognized phenomenon with some earthworms. This consists of the voluntary severance, under certain irritational stimuli, of several segments of the tail, after which the original worm may survive, but the severed fragment, eventually, always dies. Professor Gates subsequently identified the worm as *Pheretima hupeiensis* (Michaelson) 1895, and stated that it had previously been reported twice from Washington, D. C., and once from Philadelphia. Otherwise it is known only from a limited portion of China and Japan. He agreed that the fragments sent him were all autotomized and that this action might have resulted from the previous application of a vermicide to their habitat. This deduction is doubtless correct, as it was learned that mercury, both as chloride and bichloride, had been applied in light dosage several times each year and that lead arsenate, at the rate of 5 pounds to 1,000 square feet of surface, was applied in 1932, and at the rate of 3 pounds each spring thereafter. This amount of poison is easily sufficient to destroy *Lumbricus terrestris* L. and similar species, but evidently served as a mere irritant for this exotic form.

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ANOPHELES (ANOPHELES) NEOMACULIPALPUS, CURRY, EXPERIMENTALLY INFECTED WITH MALARIA PLASMODIA

DURING the latter part of 1935, experiments were begun to determine the infectibility with malaria of certain previously unincriminated species of Anophelines which breed in the Panama Canal Zone and elsewhere in the American tropics. Since that time *A. punctimacula,* Dyar and Knab, a shade-breeding mosquito which is prevalent in Panama throughout the year, has been found naturally infected with malaria plasmodia,[1] and has been proved to be highly susceptible to laboratory infection[2] with both *P. vivax* and *P. falciparum.* These observations and the epidemiological data indicate that *A. punctimacula* is probably an important malaria vector, and that it may be responsible for a considerable part of the malaria infections contracted in unsanitated regions of the Canal Zone.

It is the purpose of this note to announce the experimental infection of another species, namely, *Anopheles (anopheles) neomaculipalpus,* Curry, with *P. vivax.* This mosquito breeds in small collections of sunlit water, being especially common in the hoof-prints and muck of cattle pastures. Further studies will be required to determine the comparative infectibility and the importance of *Anopheles neomaculipalpus.*

From a search of available literature it appears that these two species, *A. punctimacula* and *A. neomaculipalpus,* are the first members of the Arribalzagaia

[1] "The Oligochaeta," by J. Stephenson, Oxford, England, 1930, p. 639.

[1] J. S. Simmons, *Am. Jour. Trop. Med.,* 16: 2, 105, 1936.
[2] J. S. Simmons, SCIENCE, 83: 2150, 269, 1936.