PLEISTOCENE HISTORY OF THE TERRESTRIAL MOLLUSCA OF FULTON COUNTY, ILLINOIS*

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INTRODUCTION

The most recent geological period, known as the Pleistocene, was characterized by the advance and retreat of several continental ice sheets. The phenomena attending the Glacial period are best developed in the Mississippi Valley, where all of the till sheets laid down by the ice may be studied in their relationship to one another. Between each glacial advance and retreat there was an interval during which the country returned to approximately its preglacial condition. It is obvious that as each ice sheet advanced it drove the fauna and flora before it or exterminated those species that could not escape. There was thus during the Pleistocene period a backward and forward swing of life, a retreat before the advancing ice and an advance into the devastated area after the ice had melted and the territory became favorable for the maintenance of life. In Illinois all of the interglacial periods are represented and all except the Aftonian (earliest) are well represented in Fulton County. Estimates of the time which has elapsed since the first glacial advance began have varied from a few hundred thousand to more than a million years. It is safe to estimate, perhaps, that not less than 500,000 years is represented in the period known as the Pleistocene, or some 400,000 years from the earliest Illinois period, the Kansan, to the present.

It is manifest that the fauna inhabiting an area subject to ice advances and retreats would be affected and the records, as far as they are known, attest that such was the case. It is surprising, however, to find that the effect upon the fauna has been so limited in the main, the larger number of species not differing greatly during this long period of time. The fauna as a whole, however, shows considerable change in regard to geographical distribution, several species now being found to the north or west of the area under consideration.

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*Contribution from the Museum of Natural History, University of Illinois, No. 66.

Fulton County is underlain wholly by Illinoian till, beyond the oldest Wisconsin moraine, the Shelbyville (fig. 1). Beneath this old till are numerous exposures of Yarmouth interglacial deposits. Singularly enough, not a record of Sangamon life is known from the county, although deposits of this interglacial interval have been noted to the southwest of Fulton County, mostly near or bordering Mississippi River. Peorian loess is noted rather abundantly in Fulton County as is also Early Wisconsin loess. Only one deposit referable to very early Late Wisconsin time has been noted, and this might well be placed in the Early Wisconsin series. In view of the recent disposition among physical geologists to consider the Iowan till as a member

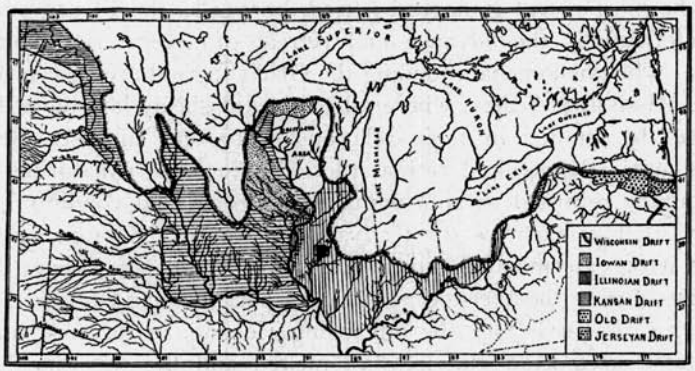

FIG. 1. Map of a portion of the United States showing the extent of the several ice sheets of the Pleistocene period. It will be noted that Fulton County, represented by the black square, lies wholly within the area of Illinoian drift-sheet beneath which may be found the Kansan till-sheet. The Yarmouth interglacial deposits lie between these two drift-sheets.

of the great Wisconsin series, the Peorian, Early Wisconsin, and Late Wisconsin life is to be contrasted with the Yarmouth and with the recent life, a three-cornered comparison. What is known as Early Wisconsin, also, should probably be referred to some one of the subdivisions of the old Early Wisconsin, as the Shelbyville or Bloomington stages. The fossil beds found in this county and recorded as Late Wisconsin are not comparable to any found in the area behind the Valparaiso moraine, which are truly Late Wisconsin.

In the table are listed all of the species of land mollusks which have been recorded from Fulton County. The recent species are included mostly on the basis of the catalog by John Wolf, published in 1870 in the American Journal of Conchology, Volume VI, page 27, and modified and supplemented by the material in the museum of the University of Illinois. The fossil species are listed from the collec-

tions made in this county by Dr. Harold R. Wanless for the Illinois State Geological Survey and now in the University museum. The careful work of Dr. Wanless in collecting this fossil material has made it possible to make the comparisons of the variation of the molluscan faunas throughout the Pleistocene period in this county.

The Recent Fauna

The recent fauna is one of the most abundant yet found in the State, including 42 species of strictly land snails and two species of amphibious snails usually associated with land species. Comparing the recent fauna with the Pleistocene as a whole we note that it is especially rich in the larger helices (Polygyra and Anguispira) which are but poorly represented in the Pleistocene and become decreasingly abundant as we pass backward into this geological period. The smaller species, Gastrocopta, Vertigo, the zonitoids, etc., are relatively abundant in the Pleistocene as they are in the recent fauna. The absence of the larger land species in the northern and central part of Illinois during the Pleistocene period is also to be noted. As far as known at present the large Polygyras have been found only in Sangamon loess deposits at Alton. As far as species are concerned, the recent fauna contains 19 species not found in the Wisconsin series, 34 species not found in Peorian deposits, and 36 species not found in Yarmouth deposits. The recent fauna, therefore, is much richer in species at present than during any period of the Pleistocene. The Pleistocene faunas contain several species and varieties not now living in the recent fauna and some species represented by different varieties.

The absence of the larger snails from the fossil deposits, particularly the Peorian and Yarmouth, is especially noteworthy, indicating changes in environment or slight differences in average temperature. The loesses of the south, as at Natchez, Mississippi contain an abundance of the larger land snails, and this may be accounted for by the differences in climate between the two areas. The fauna, especially of the Yarmouth, at once suggests climatic and environmental features similar to those of northern Michigan and Minnesota at the present time. It is to be noted that several species of the smaller snails which are absent from Fulton County deposits are known from other parts of the state, but these are few in number and do not materially change the statements made for Fulton County. There are likewise several distinct species found in other parts of Illinois which have not been found is Fulton County, as *Gonyodiscus shimekii* and *Vertigo hannai*. But this discussion is restricted to the known distribution of the molluscan fauna in Fulton County.

The Pleistocene Fauna

As far as Fulton County is concerned, the Pleistocene fauna may be divided into three series, (1) the Wisconsin series, (2) the Peorian interval, (3) the Yarmouth interval. As would be expected, the

TABLE OF MOLLUSCAN DISTRIBUTION IN FULTON COUNTY

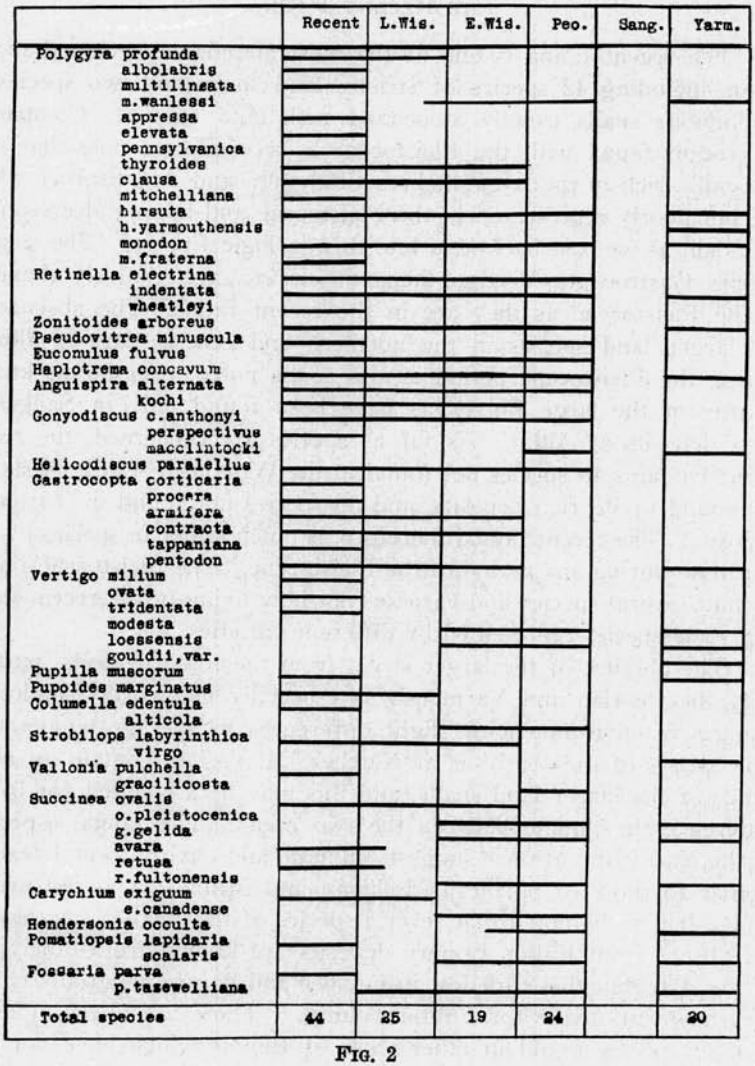

FIG. 2

Wisconsin deposits contain a fauna only slightly different from the recent fauna. There is, however, an absence of the larger land snails.

The Wisconsin series contain 34 species, of which eleven species are not now found in the recent fauna. In other words, the recent fauna is about 23 per cent richer in species than the Wisconsin faunas. Of the eleven species not now living in Fulton County, seven are considered extinct or represented by different living varieties, and four live in other parts of the United States, three outside the limits of Illinois. Those not in the recent fauna are:

Polygyra multilineata wanlessi
Vertigo loessensis
Succinea ovalis pleistocenica
Succinea grosvenori gelida
Succinea retusa fultonensis
Pomatiopsis scalaris
Fossaria parva tazewelliana

Hendersonia occulta is almost extinct in Illinois, the records from Athens, Menard County, by Pilsbry and Moline, Rock Island County and Gallatin County by Shimek, being the only authentic ones from Illinois. Throughout the entire fossil record of the Pleistocene, from Yarmouth to Early Wisconsin, this species has been one of the most abundant members of the molluscan fauna. It is evidently approaching extinction and will finally disappear, as have some of the other Pleistocene species herein noted.

Vertigo modesta is a northern species whose range extends from Labrador westward to British Columbia and northward to Alaska. In the United States the typical form has been recorded from Maine, Vermont, and Connecticut. Various races are known from California, Utah, Idaho, Colorado, Nevada, Arizona, and New Mexico. It is, therefore, at present a western and northern species, far removed from Illinois where it was once common in the fauna. *Columella alticola* is now found in New Mexico, Arizona, Colorado, Wyoming, and northward into Alberta and other parts of British America. During Early Wisconsin time it was more or less abundant in Fulton County and other parts of Illinois. *Carychium exile canadense* is a common mollusk in northern Michigan and other parts of the northern United States and Canada. It has not been found in Illinois.

The fauna of the Peorian interval contains twenty-four species, of which eight are extinct or represented by other varieties and five live outside of Fulton County, and four outside of the state. The extinct forms are:

Polygyra multilineata wanlessi
Gonyodiscus macclintocki
Vertigo loessensis
Succinea ovalis pleistocenica

Succinea grosvenori gelida
Succinea retusa fultonensis
Pomatiopsis scalaris
Fossaria parva tazewelliana

Hendersonia occulta, Vertigo modesta, Carychium exile canadense, and *Columella alticola* have been commented upon above. *Vallonia gracilicosta* is a northern and western species, now living in Minnesota, western Iowa, South Dakota, Colorado, Arizona, and the Rocky Mountain region in general. It will thus be noted that only eleven species of the recent fauna are represented in the Peorian interval, thirteen being extinct or found in other parts of the state and nation.

The Yarmouth fauna is only about half that of the recent fauna or twenty species, of which nine are extinct, two are found outside of the state, and one outside of the county. Only eight species of the recent fauna are found in the Yarmouth interval in Fulton County. The extinct and changed forms are:

Polygyra multilineata wanlessi
Polygyra hirsuta yarmouthensis
Gonyodiscus macclintocki
Vertigo loessensis
Succinea ovalis pleistocenica
Succinea grosvenori gelida
Succinea retusa fultonensis
Pomatiopsis scalaris
Fossaria parva tazewelliana

Vertigo modesta, Vallonia gracilicosta, and *Hendersonia occulta* have been commented upon. *Vertigo gouldii* is a northern species found in the New England states southward to Alabama where it follows the mountains. It is common in Canada and has been found in the extreme northern part of Minnesota. The Yarmouth form of *V. gouldii* is somewhat different from the recent form of the species in the arrangement of the teeth and may prove to be a variety.

Summary

A study of the molluscan life of Fulton County during the Pleistocene geological period shows that the larger part of this period, from Yarmouth to Early Wisconsin time, the fauna consisted of a smaller number of species than is contained in the recent fauna and that a considerable percentage of the Pleistocene species were either different specifically or varietally or were of species now found to the north or west of Illinois. The earliest interglacial period recorded in Illinois, the Yarmouth, typically a forest covered area, is so different that of

twenty species recorded from the county, only eight species are the same as those living in this area today. A noteworthy feature is the absence of the larger species of Polygyra and the abundance of the smaller species during the early and middle part of the Pleistocene period. With the exception of a few examples of a form of *Polygyra profunda* found in concretions in strata supposed to be of Sangamon age, occurring at Alton, Madison County, Illinois, and a form called variety *wanlessi* of *Polygyra multilineata,* no large *Polygyra* has been found in any Yarmouth deposit in the state and more than forty different exposures are represented in the museum collections from Illinois. With few notable exceptions, this difference between the modern and Pleistocene fauna holds good throughout the entire state. Nine species and varieties are specifically or varietally extinct, five species do not now live in Illinois, and one species is known from but three localities in the state but is absent from Fulton County.

The present molluscan fauna of Fulton County is far richer in species than any fauna of the interglacial intervals, containing sixteen species not found in any of the Pleistocene series, excepting a few in the Late Wisconsin. The fauna is seen to gradually increase in number of species from the Yarmouth interval. A feature of special interest is that the greater number of the extinct and extralimital species persist until Early Wisconsin time, when they disappear from the fauna of the county.