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**POST-GLACIAL FOSSIL VERTEBRATES FROM
EAST-CENTRAL ILLINOIS**

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Records of fossil vertebrates in Illinois are relatively few, and still fewer of these records are accompanied by reliable evidence as to their age. Considerable interest is therefore attached to recent discoveries of vertebrates, together with mollusks and wood, of undoubted post-glacial age, in Coles County, Illinois. The specimens were found in the Polecat Creek gravel pits, one mile south of Ashmore in the north half of sec. 6, T. 12 N., R. 11 E., Coles County.

The fossils collected from these pits are sufficiently varied to give a reliable picture of conditions prevailing in the region subsequent to the withdrawal of the last ice sheet. The majority of the vertebrates have been presented to Field Museum of Natural History, Chicago. The specimens of mollusks are in the Museum of Natural History, University of Illinois.

I am indebted to several persons for aid received during this investigation. Mr. Russell Cutler, operator of the gravel pits, has cooperated in saving specimens for more than ten years. Dr. George E. Ekblaw, of the Illinois State Geological Survey, very kindly visited the locality and explained several physiographic and geologic questions. In the determination of the vertebrates I have been materially aided by Mr. Bryan Patterson and other members of Field Museum staff, and by Mr. A. S. Coggeshall, formerly Director of the Illinois State Museum, now Director of the Santa Barbara Museum. Dr. Frank C. Baker, of the Museum of Natural History, University of Illinois, identified the mollusks. The specimens of wood were examined by Professor E. L. Stover, of the Eastern Illinois State Teachers College, Charleston. To all these gentlemen I wish to express my most sincere thanks.

GEOLOGY OF THE PITS

The faces of the worked pits present four strata (see fig. 81). The uppermost level is black earth averaging two feet in depth.

Beneath this occurs a layer, two or three feet in thickness, of gravel impregnated with iron oxide. Lenses of black muck containing many mollusks and fragments of wood are frequently encountered in this stratum. The mollusks and wood fragments are also found in the gravel itself, but not in comparable quantities with those found in the lenses. Below this gravel is a layer of blue clay from four to ten inches thick, often containing wood. The lowest stratum is a commercially important grayish-colored gravel from thirty to forty-five feet thick. Worked pits fill with water to the top of this stratum. The gravel constituting this bed is an outwash of Wisconsin age, apparently associated with the Shelbyville glacial lobe.¹ The deposits above it, i.e., the blue clay, gravel with lenses, and black earth, are alluvial and represent a fairly continuous deposit of post-Shelbyville age, the black earth indicating a minor change in stream drainage.¹ Vertebrates occur in all three post-glacial strata. With the exception of two small undetermined bone fragments, no fossils were collected in the basal gravel.

WOOD

Pieces of wood ranging from portions of boughs to small splinters are very numerous in the alluvial gravel. Professor Stover has identified tamarack (*Larix* sp.), elm (*Ulmus* sp.), and hickory (*Hicoria* sp.). *Larix* is typical of the Canadian zone and is a straggler to the southward. *Ulmus* and *Hicoria* are typically austral forms.

No attempt to obtain pollen samples has been made. The possibility that pollen might be found in the muck lenses in the alluvial gravel should be kept in mind by anyone who is planning work in the locality.

INVERTEBRATES

The mollusks found in the iron-impregnated gravel show conclusively, according to Dr. Baker's determinations, that the alluvial strata are of post-glacial age. Ten species are represented, and all but one are members of the recent fauna of Illinois. The species present are as follows:

<i>Sphaerium sulcatum</i> (Lam.)	<i>Stagnicola reflexa</i> (Say)
<i>Pisidium</i> sp. indet.	<i>Fossaria obrussa</i> (Say)
<i>Goniobasis livescens</i> (Menke)	<i>Physa gyrina</i> Say
<i>Helisoma anceps</i> (Menke)	<i>Physa integra</i> Haldeman
<i>Gyraulus altissimus</i> (Baker)	<i>Ferrissia fusca</i> (C. B. Adams)

Gyraulus altissimus, while not represented in the recent fauna of Illinois, is present in Post-Wisconsin deposits all over the northern and central part of the state.

¹ Dr. George E. Ekblaw, personal communication.

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VERTEBRATES

The specimens from the black earth and from the alluvial gravel are presumably of slightly different ages and are accordingly listed separately. The one specimen found in the blue clay layer is in-

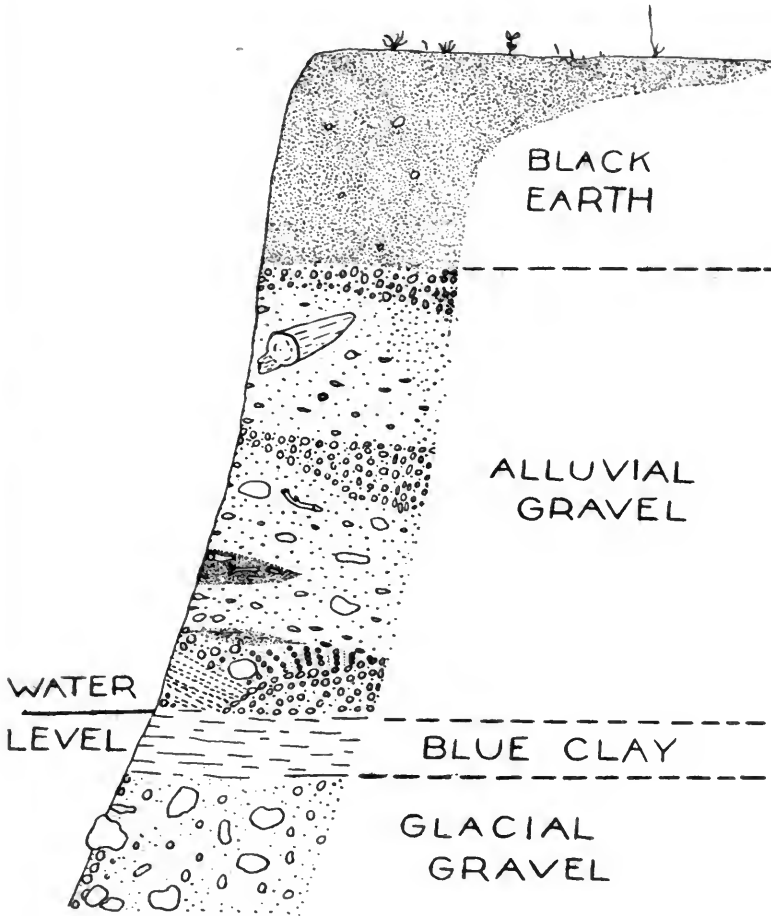


FIG. 81. Section at the Polecat Creek gravel pits, Coles County, Illinois.

cluded in the gravel list. Due to the method of working the pits, it is unfortunately necessary to add a third "uncertain" list. The operators first strip off the black earth with a steam shovel and then start an excavation in the gravel face, the gravel from both sides slumping into the excavation. Many finds were made in such exca-

vations. While it is highly probable that these specimens came from the alluvial gravel, the faint possibility remains that they might have come down from a patch of black earth that escaped the shovel, or might have dropped to the ground from a shovelful of black earth. The excavations continue well down into the lower glacial gravel, but I do not consider it at all likely that any of the fossils in question came from this stratum. The two fragments collected from its face are very different in appearance from the other remains obtained, being heavily abraded, whitish in color as opposed to brown, and much harder. In the following lists the extinct forms are marked by a dagger.

SPECIMENS FROM THE ALLUVIAL GRAVEL

Blarina brevicauda (Say). SHORT-TAILED SHREW.

Posterior part of right mandible with much worn M_3 . The first fossil record for the central states (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, and Missouri). F.M. No. P15191.

Sylvilagus floridanus (Allen). COTTONTAIL.

Calcaneum. The only other fossil record for Illinois is from the lead region about Galena (Hay, 1923, p. 337). F.M. No. P15193.

†**Castoroides ohioensis** Forster. GIANT BEAVER.

A large tibia-fibula (F.M. No. P15272) exceeding in size that of the splendid skeleton in the Field Museum collections from Fairmount, Grant County, Indiana.

MEASUREMENTS

	MM
Tibia, maximum length	237
Tibia, tr. diameter of proximal end	64
Tibia, a.-p. diameter at center of shaft	31
Tibia, tr. diameter of distal articular surface	28
Tr. diameter of distal end of tibia-fibula	49

†(?)**Megalonyx** sp. GROUND SLOTH.

Incomplete neural arch of an anterior dorsal vertebra. F.M. No. P15770. Three finds of *Megalonyx jeffersoni* in Illinois have been reported. One of these is from the crevices in the Galena region, another from undoubted post-glacial deposits near Urbana (Hay, 1923, p. 33). The third is from the "post-mid-Pleistocene" (Leighton, 1921) of the Alton region.

Canis latrans Say. COYOTE.

Left femur. E.C.G. Coll. No. 2929. A specimen from the Galena crevices provides the only previous fossil record in Illinois.

***Canis familiaris* Linnaeus. INDIAN DOG (fig. 82).**

Left mandible, slightly imperfect in the incisor region, $P_{\bar{2}}$, $P_{\bar{4}}$, $M_{\bar{2}}$, preserved. F.M. No. P15192.

This specimen did not agree with any of the wild North American canids preserved in the Field Museum collections, and I suspected that it might be from a domestic form. The specimen was sent to the United States National Museum for comparison and examined by Major E. A. Goldman, who reported as follows:¹ "I have compared

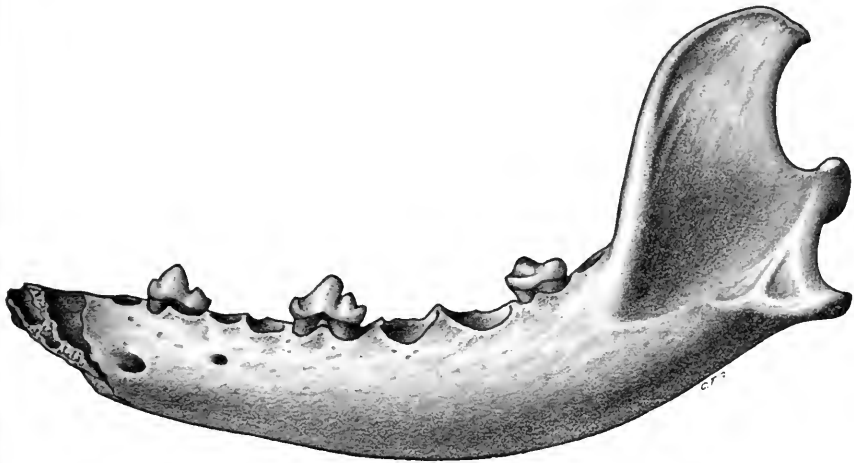


FIG. 82. *Canis familiaris*. Lateral view of left mandible. F.M. No. P15192. x 1/1. Drawn by Carl F. Gronemann.

the jaw rather carefully with a number of coyotes in our large collection, and with modern dogs and Indian remains. I think the jaw is that of an Indian dog. I have not been able to match it exactly, but both Indian dogs associated with kitchen middens and modern dogs vary tremendously, and this conclusion is based on general resemblances and the probabilities in the case. It really most closely approaches the jaw of a modern dog than any other. Mr. Gerrit S. Miller, Jr., to whom I showed the jaw, concurs in this conclusion."

This find is of importance since it indicates that man was contemporaneous in Illinois with large mammals that are now extinct, but which survived the Wisconsin glacial advance.

¹ Letter to Mr. Bryan Patterson, December 21, 1936.

MEASUREMENTS

	MM
Length, condyle to I_1^*	113.0
Length, P_1-M_3 (alveolar measurements).....	64.0
Length, P_1-P_4 (alveolar measurements).....	33.0
P_2 , a.-p.....	8.0
P_2 , tr.....	3.5
P_3 , a.-p.....	10.0
P_3 , tr.....	4.5
M_2 , a.-p.....	7.5
M_2 , tr.....	5.5
Depth, coronoid process to angle.....	42.5
Depth of ramus beneath P_3	16.0
Depth of ramus beneath M_1	17.0

*The jaw being slightly imperfect anteriorly, this measurement is to a small extent estimated.

†*Mammot americanum* (Kerr). AMERICAN MASTODON.

Incomplete left mandible with M_1-P_3 , M_3 not yet erupted, F.M. No. P15201. Portion of symphysis, E.C.G. Coll. No. 2880.

Odocoileus virginianus (Boddaert). WHITE-TAILED DEER.

Two antler fragments, one from the blue clay, incomplete tibia. F.M. Nos. P15195, P15196.

Ovibovinae, gen. et sp. indet. UNDETERMINED MUSK-OX.

Anterior dorsal vertebra. F.M. No. P15273. From the comparative material available, it is not possible for me to decide whether the specimen is referable to *Ovibos* or to one of the extinct forms.

MEASUREMENTS

	MM
Width across transverse processes.....	97
a.-p. diameter of centrum at center.....	53
Tr. diameter of anterior face of centrum.....	61
Tr. diameter of posterior face of centrum.....	62
Anterior diameter of neural canal.....	21
Posterior diameter of neural canal.....	24

Bison bison (Linnaeus). AMERICAN BISON.

Incomplete cervical vertebrae and distal end of humerus, F.M. No. P15194. Cervical vertebra, E.C.G. Coll. No. 2931.

SPECIMENS PROBABLY, BUT NOT CERTAINLY, FROM ALLUVIAL GRAVEL

Homo sapiens Linnaeus. AMERIND.

Complete right parietal, slightly waterworn in one spot, with fragments of the occipital attached. It is highly regrettable that this specimen was not collected *in situ*. In common with the others encountered in the excavations it very probably came from the alluvial gravel, but the possibility of intrusion from the overlying black earth cannot be eliminated entirely. However, the finding of

the domestic dog jaw *in situ* in the alluvial gravel re-enforces the probability that the specimen came from this level. F.M. No. P15211.

Ondatra zibethica (Linnaeus). MUSKRAT.

Incomplete tibiae-fibulae of three individuals, one of them young. A skull found in post-glacial deposits of the Sag low-water stage of Lake Chicago near Lemont, Illinois (Baker, 1920, p. 89), represents the only previous fossil record of the species in the central states. F.M. No. P15200.

Canis lupus Linnaeus. WOLF.

Left squamosal and otic region. F.M. No. P15197. Pocock (1935) has recently reduced most of the groups of wolves formerly regarded as distinct species to the rank of subspecies of *C. lupus*, an arrangement that has been followed by Goldman (1937). This simplifies treatment of fragmentary Pleistocene material. Earlier authors have referred fragments to *nubilus* or to *occidentalis* despite the fact that it is apparently difficult to separate these forms even when series of skins and skulls are available. The earlier alternative of listing such material as *Canis* sp. required explanatory text if readers were not to be left in doubt as to what type of canid was represented.

Procyon lotor (Linnaeus). RACCOON.

Incomplete left mandible with molar alveoli preserved. The first fossil record of the species from the central states.¹ F.M. No. P15198.

Ursus sp. cf. **U. horribilis** Ord. GRIZZLY.

Large upper canine, comparable in size to canines of large grizzlies and to those of the *U. gyas* group. F.M. No. P15199. The large size of the specimen, 18.5 mm. in transverse by 27.5 mm. in antero-posterior diameter at the alveolar level, immediately excludes it from *U. (Euarctos) americanus*. The bears of the *U. gyas* group are confined to the extreme northwest and are very probably recent immigrants from Asia. It is almost certain therefore that the canine indicates the presence of a bear of the *U. horribilis* group, thus constituting the fifth record of fossil grizzlies in North America, and the second in the central states. The other finds have been made in Oklahoma (Stovall and Johnston, 1935; Stovall, 1936) and in Ohio. The Ohio specimen, *Ursus procerus*, is a member of the grizzly group, according to Stovall and Johnston.

¹ The extinct *P. priscus* Leidy comes from the Galena region.

Cervus canadensis Erxleben. WAPITI.

Incomplete antler. F.M. No. P15207.

†**Cervalces roosevelti** Hay. ROOSEVELT'S DEER-MOOSE.

An incomplete antler of this species adds one more record to the increasing number of *Cervalces* finds. The major character separating *C. roosevelti* from *C. scotti* is the much greater length of the beam in the holotype of the former (Hay, 1913, p. 5). The antler at hand and those recently recorded by Riggs (1936, p. 664), although not as long in the beam as Hay's type, are closer to *roosevelti* than to *scotti*. The beam lengths of these specimens from the burr to the base of the ascending branch are as follows: Ashmore, Coles County, Illinois, 281 mm.; Beecher, Will County, Illinois, 286 mm.; Minooka, Kendall County, Illinois, 204 mm. (young); White River, near Hazelton, Gibson County, Indiana, 268 mm. The Indiana specimen is the most complete specimen of the species so far found and includes a large part of the ascending branch extending well beyond the point of divergence of the anterior and posterior portions. The maximum width of the base of the posterior portion is considerably less (58 mm.) than that of the Princeton specimen of *C. scotti* (131 mm. on the right side, 119 mm. on the left).¹ More and better specimens may show other differences. On the other hand it seems entirely possible that more material would show that the recorded differences are merely individual variations, or perhaps of subspecific value only.

The holotype of *C. roosevelti*, from Iowa, and a specimen recently recorded from Nebraska (Schultz, 1934, table A and p. 388), are stated to have come from interglacial or glacial deposits. The Illinois specimens from Beecher and Minooka (White Willow) (Hay, 1923, pp. 107-108, 337), as well as that from Ashmore, are from post-glacial deposits. The age of the Indiana antler is unknown.

Odocoileus virginianus (Boddaert). WHITE-TAILED DEER.

Four incomplete antlers, incomplete atlas, cervical vertebra, incomplete scapula, three pelvic fragments, two incomplete adult humeri, one young humerus, incomplete tibia, astragalus. F.M. Nos. P15202-6.

Bison bison (Linnaeus). AMERICAN BISON.

Incomplete periotic, incomplete dorsal and lumbar vertebrae, rib fragment, incomplete tibia, two incomplete metacarpals from young individuals. F.M. Nos. P15209, P15210.

¹ I am indebted to Dr. Glenn L. Jepsen for these measurements.

Meleagris gallopavo Linnaeus. WILD TURKEY.

Distal half of ulna-radius. The first fossil record of the species in the central states. I am indebted to Dr. Alexander Wetmore for the determination. F.M. No. P15212.

Terrapene ornata (Agassiz). BOX TURTLE.

Incomplete carapace. The first fossil record of the species. F.M. No. P15213.

Pseudemys sp.

Two plastral fragments. The first fossil record of the genus in the central states. F.M. No. P15214.

(?)Chrysemys sp.

Plastral fragment. If the tentative identification is correct, this specimen represents the first fossil record of the genus in the central states. F.M. No. P15215.

SPECIMENS FROM THE BLACK EARTH DEPOSIT

Canis lupus Linnaeus. WOLF.

A canine with two holes bored in the root, evidently by Indians. F.M. No. P15216.

Lynx sp. BOBCAT.

Distal end of humerus of young individual with entepicondylar foramen injured. The first fossil record of the genus in the central states. F.M. No. P15218.

Odocoileus virginianus (Boddaert). WHITE-TAILED DEER.

Two antler fragments, incomplete tibia, astragalus, and a very small scapula which compares well in character with adult scapulae. Possibly this scapula was foetal, and may have been extracted by Indians from a gravid female. F.M. No. P15219.

Bison bison (Linnaeus). AMERICAN BISON.

Complete metacarpal, lunar, and scaphoid, all associated; F.M. No. P15220. Incomplete humerus, E.C.G. Coll. No. 1100. Two incomplete nasal bones, E.C.G. Coll. Nos. 1174, 1175.

Canis latrans Say. COYOTE.

A nearly complete humerus was obtained from a locality about 150 yards west of the gravel pits, probably from the black earth horizon. F.M. No. P15217.

This collection of 21 forms is the largest from any one Illinois locality that has so far been reported. It increases the known number of Illinois Pleistocene vertebrates by about one-third. The extinct forms have all been reported previously from post-glacial deposits. Their evident association with man is interesting but not surprising in view of recent discoveries in the western United States. This association tends to strengthen the belief that man was largely responsible for the extinction of many large mammals that survived into post-glacial time in North America.

ENVIRONMENT

The wood remains, particularly *Hicoria*, indicate climatic conditions essentially similar to those prevailing in northern Illinois at the present day. The invertebrates, all but one members of the existing fauna of the state, are in complete agreement. Dr. Baker states that they indicate the presence of a shallow but not swampy body of water with "perhaps a small stream . . . draining the surplus water."¹

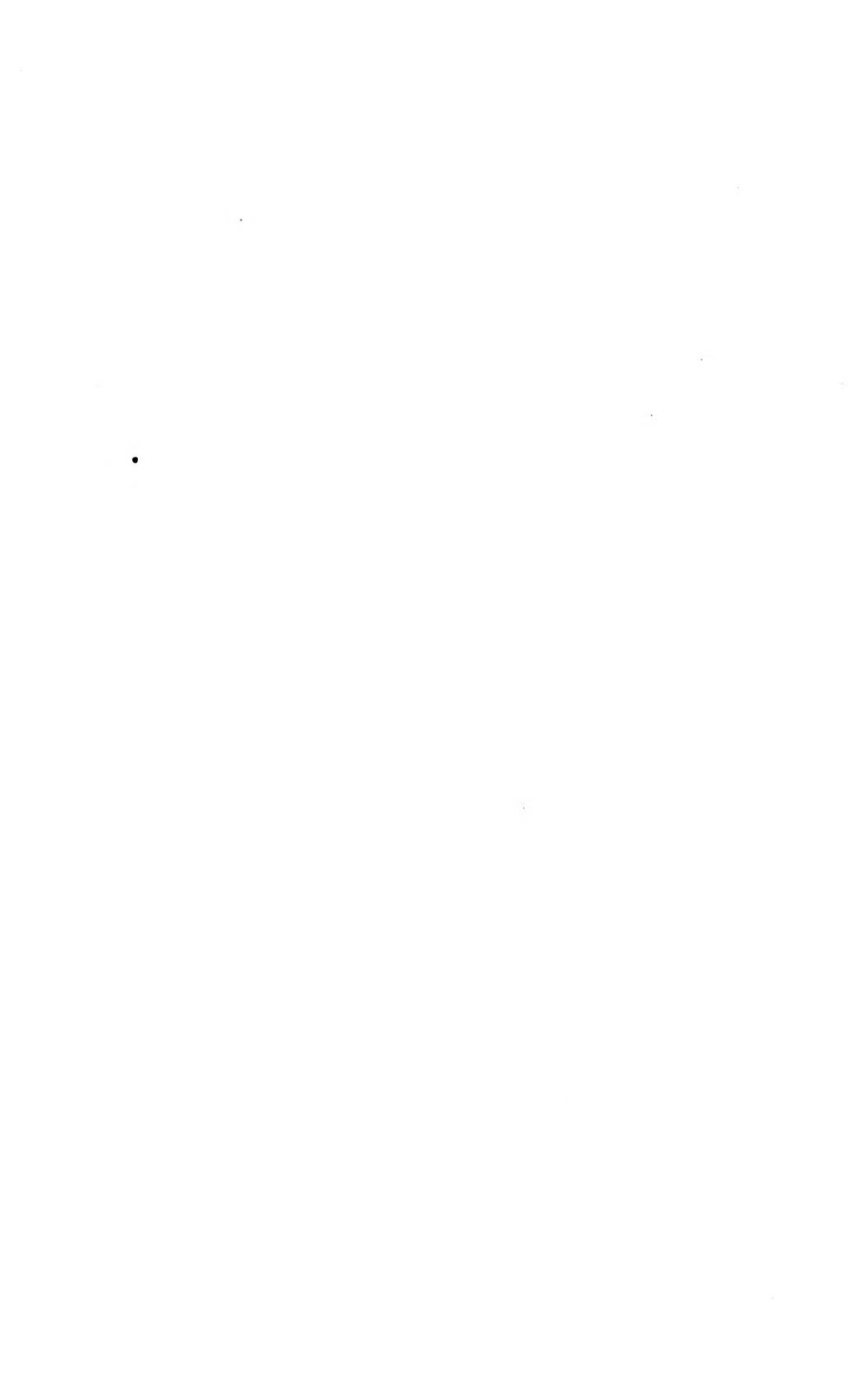
The turtle and muskrat remains agree with the invertebrates in suggesting the presence of a stream. The remainder of the mammals, with one possible exception, appear to call for wooded areas in the country surrounding the body of water, interrupted by stretches of meadow with brushy thickets.

The possibly discordant note is provided by the vertebra of the undetermined ovibovine. This specimen does not appear to have been redeposited, for it is similar in appearance to the other specimens found in the alluvial gravel and is not waterworn. It perhaps represents a winter straggler from a colder isothermal belt that was not far away to the northward, or it may belong to an extinct genus adapted to a milder climate than the living *Ovibos*. Whatever the case it can hardly affect the conclusion derived from the rest of the fossil assemblage that the climatic and ecologic conditions prevailing in the area during the time of deposition of the alluvial gravel were essentially similar to those that persisted into early historic time in Coles County.

¹ Letter to Dr. George E. Ekblaw, September 19, 1936.

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