



A new Late Pleistocene fauna from northeastern New Mexico

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A NEW LATE PLEISTOCENE FAUNA FROM NORTHEASTERN NEW MEXICO

by

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INTRODUCTION

In the spring of 1969, Dr. Sidney R. Ash donated to the Sternberg Memorial Museum some fossil molluscs which he and Fred Trauger of the U.S. Geological Survey had collected in northeastern New Mexico (Fig. 1) from a sand deposit of late Pleistocene age. Examination of the material revealed that some bone fragments, including a partial salamander vertebra, had been included in the matrix from which the molluscs were obtained. Discovery of the vertebra prompted the acquisition of more matrix from the site. Approximately forty pounds of additional matrix was provided by Trauger who reported also an earlier discovery of a 24-inch length of proboscidean tusk from the beds. The additional matrix was washed using the method described by Hibbard (1949). Subsequently, the site was visited by Zakrzewski and additional material was collected. The specimens obtained are housed in the collection of

the Sternberg Memorial Museum (catalogue numbers 13579 to 13602). These remains comprise a new local fauna, here named the Casados Ranch. We wish to acknowledge Mr. Fred Trauger for his discovery of this site and aid in this study, Drs. Henry van der Schalie and Claude W. Hibbard of the University of Michigan and Dr. Eugene D. Fleharty of Fort Hays Kansas State College for the loan of specimens in their care, and Dr. Jerry R. Choate of Fort Hays Kansas State College for critically reading the manuscript.

FAUNAL LIST

A total of twenty species of molluscs and three vertebrate classes are represented in the fauna. A complete faunal list follows (extinct taxa are denoted by an asterisk):

Class Pelecypoda

Order Teleodermata

Family Sphaeriidae

Pisidium casertanum (Poli)

Class Gastropoda

Order Basommatophora

Family Lymnaeidae

Stagnicola reflexa (Say)

Fossaria dalli (Baker)

F. obrussa (Say)

Family Planorbidae

Gyraulus circumstriatus (Tryon)

G. parvus (Say)

Promenetus exacuous form *kansasensis* (Baker)

Family Physidae

Physa gyrina (Say)

Order Stylommatophora

Family Pupillidae

Pupilla blandi Morse

P. muscorum (Linnaeus)

Gastrocopta cristata (Pilsbry & Vanatta)

G. tappaniana (Adams)

Vertigo elatior (Sterki)

V. milium (Gould)

V. ovata (Say)

Family Valloniidae

Vallonia cyclophorella Sterki

V. gracilicosta Reinhardt

Family Succineidae

Succinea sp.

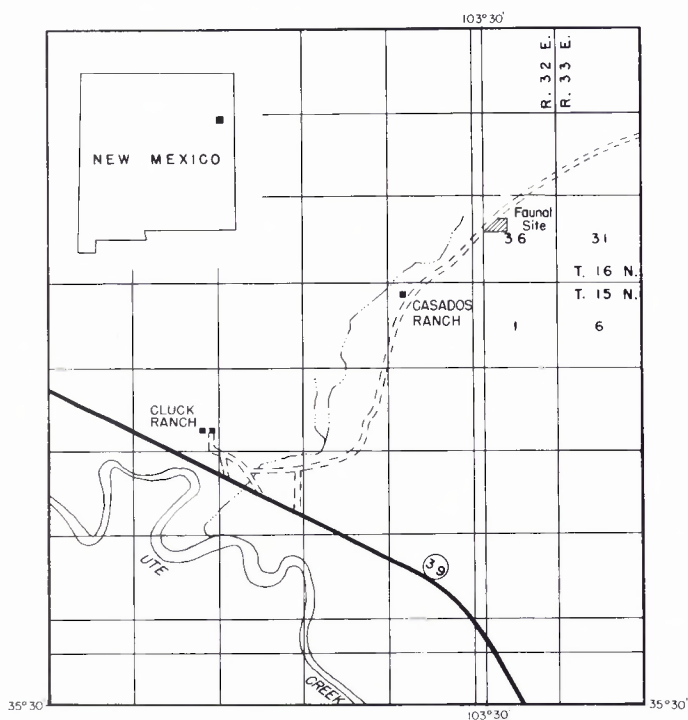


Figure 1. Map showing the fossil locality (SE $\frac{1}{4}$, NW $\frac{1}{4}$, Sec. 36, T. 16 N., R. 32 E.; crosshatched area) in Harding Co., New Mexico. Inset map of New Mexico shows the location of this area by the black square.

Family Zonitidae
Euconulus fulvus (Muller)
Nesovitrea electrina (Gould)

Class Amphibia

Order Caudata

Family Ambystomatidae

Ambystoma sp.

Class Aves

Gen. *et* sp. indet. (shell fragment)

Class Mammalia

Order Proboscidea

Gen. *et* sp. indet.

Order Perissodactyla

Family Equidae

*Equus niobrarensis** Hay

PALEOECOLOGICAL INTERPRETATIONS

The paleoecology of the Casados Ranch l.f. (local fauna) is based on the habitat preferences of extant representatives in the fauna. Habitat preferences for the molluscs are from Taylor (1960), Hibbard and Taylor (1960), and Miller (1966) and follow:

HABITAT	SPECIES
Hygrophilic: situated under debris, leaf mulch or sticks in shaded areas.	<i>Vertigo ovata</i> <i>V. milium</i> <i>V. elatior</i> <i>Gastrocopta tappaniana</i>
Woodland: found under leaf mulch, among tall grasses, and fallen timber.	<i>Euconulus fulvus</i> <i>Nesovitrea electrina</i>
Sheltered areas: confinement to a woodland situation is not mandatory as these species can withstand dry conditions.	<i>Gastrocopta cristata</i> <i>Pupilla blandi</i> <i>P. muscorum</i> <i>Vallonia cyclophorella</i> <i>V. gracilicosta</i>
Marginal: occurring near water's edge under drift, mud and in shallow pools.	<i>Fossaria dalli</i> <i>F. obrussa</i>
Shallow quiet water: oxbows, marshes and sloughs that may be subjected to seasonal drying.	<i>Pisidium casertanum</i> <i>Stagnicola reflexa</i> <i>Physa gyrina</i> <i>Gyraulus circumstriatus</i>
Shallow quiet water: oxbows, marshes and sloughs that are rarely subjected to seasonal drying.	<i>Gyraulus parvus</i> <i>Promenetus exacuous</i> form <i>kansasensis</i>
Uncertain:	<i>Succinea</i> sp.

The abundance of *Gyraulus parvus* and *Vallonia gracilicosta* in the Casados Ranch l.f. suggests that the immediate area of deposition was a quiet, back-water area or slough bordered by savannas and short grass uplands. The presence of the salamander, *Ambystoma*, also emphasizes the concept of a permanent water environment. The savannas would support, in addition to *V. gracilicosta* the populations of *Pupilla muscorum*, *Gastrocopta cristata*, *Euconulus fulvus*, and *Nesovitrea electrina*. The savannah would also be the likely

habitat of the proboscidean whose presence is indicated by the tusk reported by Trauger. *Equus* would most likely occur on the short grassland. The presence of northern or high altitude molluscan elements, such as *Pupilla muscorum*, *Stagnicola reflexa*, and *Vallonia gracilicosta*, suggest a cooler and more humid climate than is found in this area at present.

AGE OF THE FAUNA

The presence of molluscs with extant northern or high altitude distribution suggests that the fauna represents a glacial age. Unfortunately, the stratigraphic ranges of the taxa, with one exception, are throughout most of the late Cenozoic. Only *Promenetus exacuous* form *kansasensis* has not been reported from faunas younger than Illinoian age (Miller, 1966). Because we have found only one specimen of this taxon and because considerable controversy exists with regard to the systematics of the *P. exacuous-kansasensis* complex (see Miller, 1966 for discussion) use of this form as a stratigraphic indicator does not seem justified.

The molluscan elements of the Casados Ranch l.f., however, do show a high correlation with Illinoian local faunas previously reported from the High Plains (Hibbard and Taylor, 1960; Miller, 1966). Simpson's (1962, p. 56) index of faunal resemblance was used to compare the Casados Ranch with five Illinoian High Plains local faunas. Each correlation was greater than 60 percent and the resemblance was 95 percent with the Doby Springs l.f. of Oklahoma (of the forms present in the Casados Ranch l.f. only *Vallonia cyclophorella* is not known from the Doby Springs) and 90 percent with the Butler Spring l.f. from southwestern Kansas. The index of faunal resemblance was less than 50 percent with faunas of Wisconsin age from the southern Great Plains.

The Casados Ranch l.f. has three taxa in common, *Pupilla blandi*, *Vallonia gracilicosta*, and *Succinea* sp. (index of resemblance = 20%), with the Dry Cave l.f. of southeastern New Mexico. The latter fauna is Woodfordian (late Wisconsin), and as a radiometric date of $14,470 \pm 250$ B.P. (Metcalf, 1970). The lack of faunal resemblance, however, may reflect the presence of two distinct biotic provinces, as is the case between these areas today, rather than dissimilarity of age.

The fact that these three taxa, which occur in the late Pleistocene of northeastern New Mexico, are also found in the late Pleistocene of southern Kansas lends support to Metcalf's (1970) suggestion that migration of molluscs was southward along an extension of the piedmont grasslands rather than (or in addition to) downward from nearby mountain ranges.

CONCLUSIONS

The character of the Casados Ranch l.f. suggests that a cooler, more humid climate must have existed at the time of deposition than is found in northeastern New Mexico at the present time. Comparison of the Casados Ranch l.f. with five Illinoian local faunas from the High Plains demonstrates a closer resemblance to the latter than to Wisconsin local faunas from the same vicinity. The presence of similar molluscs in late Pleistocene deposits of southern Kansas, northeastern New Mexico, and southeastern New Mexico implies that migration of these taxa might have taken place along an extension of the piedmont grasslands rather than (or in addition to) downward from nearby mountain ranges.

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