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FAUNA OF THE VALE AND CHOZA: 13

Diadectes, *Xenacanthus*, and Specimens of Uncertain Affinities

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INTRODUCTION

In the previous twelve papers of this series, genera and species for which considerable information was available have been discussed. Most of these could be placed with confidence in supergeneric categories and details of their morphology could be presented. The collections from the Vale and Choza contain a few specimens that cannot be referred to known genera but are inadequate for generic description, and fragments of known genera that have not been considered before, since there is little definitive knowledge about their associations and occurrences. These are taken up in the present paper.

CLASS REPTILIA

Subclass Parareptilia

Infraclass Diadecta

Family Diadectidae

Diadectes sp.

Until recently it appeared that *Diadectes*, a relatively common genus of the Wichita and early Clear Fork, was not present in the Vale (Olson, 1952). A single vertebra, CNHM-UR 270, was discovered in the early deposits of western Baylor County in 1952. The vertebra is in a fair state of preservation and its generic assignment poses no problem. There is, however, no morphological basis for specific assignment, for the vertebrae of this genus are not specifically diagnostic. It seems probable that the specimen pertains

to the species *D. tenuitecis*, since this is the only species present in the underlying Arroyo. It may, of course, represent an undescribed species.

The vertebra was found in a channel fill composed of fine conglomerate, about 100 feet above the base of the Vale Formation. There can be no question of its stratigraphic position. *Diadectes* becomes increasingly rare from the base to the top of the Arroyo. This single specimen constitutes the only evidence that it continued into the Vale. It is, of course, conceivable that the specimen was introduced into the Vale by a reworking of Arroyo materials, but there is no positive evidence in this direction. No trace of *Diadectes* has been found as yet in the middle of late Vale or in the Choza. Specimens may eventually turn up, but very extensive collecting has not produced even a scrap that can be assigned to the genus.

Class CHONDRICHTHYES

Subclass Elamosbranchii

Order Xenacanthodii

Family Xenacanthidae

Xenacanthus cf. *platypternus*

From the standpoint of abundance, the fresh-water shark *Xenacanthus* is in marked contrast to *Diadectes*, for remains of the genus are common from the base to the top of the Vale and occur sporadically from the base of the Choza to the highest producing beds in the middle of this formation. Remains are predominantly teeth and fragments of calcified cartilage. A crushed, but otherwise well-preserved specimen that consists of a chondro-cranium, jaws and visceral arches, CNHM-UF 566, has been found in the lower Vale in the Crooked Creek area. A second specimen, CNHM-UF 565, consisting of impressions of jaws and gill supports, has come from beds transitional between the Vale and the Choza, at locality KK, in Knox County, Texas.

Teeth are abundant in many of the channel deposits in the Vale and also occur in pond deposits at various levels in this Formation. This is in contrast to the Arroyo below and Choza above, in which remains of *Xenacanthus* appear to be confined to stream deposits. The highest known occurrence of *Xenacanthus* in the Clear Fork is in beds of mid-Choza age, in Foard County, Texas. A few teeth occur in channel conglomerates at this level. The genus is known,

however, from the overlying San Angelo Formation of Texas (Olson and Beerbower, 1953).

It is difficult to assign the known materials to species or to know whether one or more species were present. The teeth appear to be relatively uniform, except for size, throughout the Vale and Choza, and to conform closely to those of *Xenacanthus platypternus* (Cope) as described by Hotton (1952). As he noted, the jaw cartilages, at least at present, are of little aid in separation of *X. texensis* and *X. platypternus*, the two Texas species. In view of the resemblances of the teeth from the Vale and Choza to those of *X. platypternus*, of the Arroyo, it is probable that the sharks from these deposits were closely related to, perhaps identical with, this species. Tentative assignment has thus been made.

Class **REPTILIA**
Subclass **Eureptilia**
Order **Pelycosauria**
Suborder **Edaphosauria**
Family **Edaphosauridae**
Genus nov., unnamed

The specimen that is the basis for the following discussion consists of a single toothed palate (CNHM-UR 29) from locality KC of the upper Vale. Figure 135 is a semi-diagrammatic representation of the specimen. The preserved part consists of a plate of bone about 5 inches long, which is set with 8 rows of more or less regularly spaced teeth. The crowns of the teeth are bluntly conical and the bases are set firmly in bone. As shown in the figure, one row of teeth splits into two anteriorly.

The specimen was found in a channel fill composed of clay pebble conglomerate. It was in direct association with *Diplocaulus*, and in the immediate vicinity, in lateral off-channel deposits, *Captorhinus* was present. No other specimens that can definitely be assigned to the genus have been found in the Vale, in spite of the ease of recognition of the palatal teeth and the excessive size of the animal as indicated by the palate. Whether this animal lived in the area or was washed in from another life zone cannot be determined, although the failure to find other specimens suggests that the second interpretation may be correct.

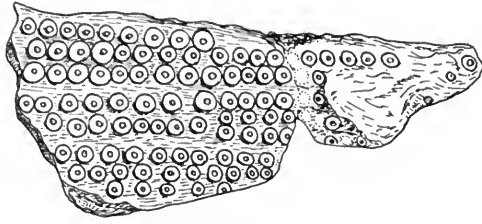


FIG. 135. Palate of new genus of reptile (unnamed), CNHM-UR 29; $\times \frac{1}{2}$.

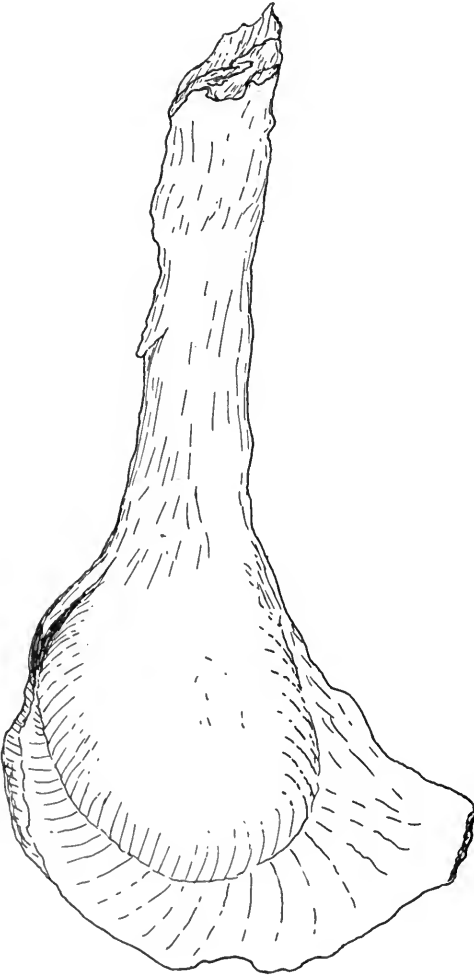


FIG. 136. Scapulo-coracoid of unnamed genus of ?reptile, CNHM-UR 268; $\times \frac{1}{4}$.

It is probable that the animal represented by the palate was a reptile, for no known amphibian even vaguely resembles it in the formation of the palate. Among the reptiles, the most probable relationships are with the edaphosaurids, in which toothed palates are characteristic. It differs from other known genera of edaphosaurids in size and the regularity of the rows of teeth. The possibility that the palate represents a captorhinomorph, rather than an edaphosaurid, cannot be ruled out. The captorhinomorphs of the Vale and Choza had multiple rows of teeth, and in *Labidosaurikos* and *Captorhinikos* these were arrayed in more or less regular rows. Palatal teeth were not, however, strongly developed in these genera. In *Rothia*, from the San Angelo, long, irregularly placed palatal teeth were present, but the pattern was very different from that seen in the specimen under consideration. *Waggoneria*, which has been tentatively assigned to the Seymouriamorpha, had palatal teeth, but these were arrayed in a roughly crescentic pattern. There seems little chance that the new genus could be related to this group.

Edaphosaurus, the only well-known edaphosaurid of the Arroyo, had strongly developed, blunt palatal teeth. The arrangement, however, is irregular and not like that in the Vale specimen. Modifications of the general *Edaphosaurus* pattern could have produced the condition shown in figure 135. If the animal is an edaphosaurid, it must have been of truly gigantic proportions, for the edaphosaurid head is notably small in proportion to the trunk and limbs. Although the specimen clearly does not pertain to any known genus, it is too fragmentary to serve as a suitable type and, for this reason, has not been named, pending the discovery of more adequate materials.

Class REPTILIA

Genus nov., *incertae sedis*

A second puzzling specimen (CNHM-UR 268), from locality KD in the upper Vale, consists of a large scapulo-coracoid in a very poor state of preservation. In spite of the lack of detail, it is evident that this specimen does not pertain to any previously known genus. The scapular blade is over 10 inches tall and very narrow at the base (fig. 136). Details of the lower part of the scapula and coracoid are obscured by the presence of a large mass of gypsum that crystallized within the bone between the medial and lateral surfaces.

There is no known reptile or amphibian from the Arroyo, Vale or Choza that closely resembles this specimen. The general charac-

teristics appear to be reptilian rather than amphibian. The closest resemblance to any known genus is to *Tappenosaurus* of the San Angelo and Flower Pot Formations, which overlie the Clear Fork. It would be foolhardy, however, from the available evidence, to suggest a real affinity to this genus. It is possible that this specimen and the palate, CNHM-UR 29, described above, are parts of members of the same genus or species, for there is no barrier in size, and they occur at the same level in the Vale. Outside of these facts, however, there is no concrete evidence to support this idea.

The most probable explanation for this specimen, and for the palate noted above, is that they are from animals that were not characteristic of the fauna of the Vale deltaic area, but were brought in by physical transportation, or, perhaps, strayed into the area from their more characteristic habitat.

REFERENCES

HOTTON, NICHOLAS, III

1952. Jaws and teeth of American xenacanth sharks. *Jour. Paleon.*, **26**, pp. 489-500, 1 pl.

OLSON, E. C.

1952. The evolution of a Permian vertebrate chronofauna. *Evolution*, **6**, pp. 188-196, 5 figs.

OLSON, E. C., and BEERBOWER, J. R.

1953. The San Angelo Formation, Permian of Texas, and its vertebrates. *Jour. Geol.*, **61**, pp. 389-423, 10 figs.

