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AGE STRUCTURE IN A SAMPLE OF *TEXOCEROS* (MAMMALIA, ANTILOCAPRIDAE) FROM GARDEN COUNTY, NEBRASKA

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The University of Nebraska State Museum collections include a large sample of dentitions and skeletal elements of a late Pliocene antilocaprid which Kent (1963) has referred to the species *Texoceros* cf. *guymonensis.* At least 95 individuals are represented in this sample which was collected from the University of Nebraska State Museum locality Gd-10, located in the SE¼ NE¼ sec. 29, T. 16 N., R. 44 W. Lower jaws and dentitions are the most common elements preserved in the sample.

Individuals of two other species of pronghorns have previously been aged on the basis of characters of the lower dentition. Dow and Wright (1962) studied various stages of tooth replacement and wear presented by individuals of the modern pronghorn species, *Antilocapra americana,* whose ages were known. Voorhies (1969) studied a sample of the early Pliocene pronghorn, *Merycodus furcatus,* from Verdigre, Nebraska and was able to demonstrate the presence of discrete yearly age classes. Voorhies was able to suggest absolute ages for these classes by comparing wear stages with those exhibited by the living African duiker, *Sylvicapra grimmia,* which had been studied by Riney and Child (1960). The duiker was used in this comparison because it is similar in size to *Merycodus.*

Texoceros is intermediate between *Antilocapra* and *Merycodus* in geologic age and size. Because of its size, *Texoceros* would be expected to have matured more slowly than the smaller *Merycodus* and more rapidly than *Antilocapra,* a larger animal. Individuals of each genus which show the same stage of tooth replacement or wear would have three different ages with *Merycodus* being the oldest and *Antilocapra,* the youngest.

Texoceros was aged on the basis of the mandibular dentitions. The criteria used were the degree of replacement of the deciduous cheek teeth and eruption of the permanent cheek teeth and the wear patterns on the occlusal surfaces of these teeth. Fossettes on the molars and premolars of *Antilocapra* disappear with age in a fairly rigid sequence (Dow and Wright, 1962). The same appears to be true for the fossettes on the molars of *Texoceros.* Crown height, which Voorhies (1969) used as a criteria for aging *Merycodus,* was not a realistic tool to use in this study for several reasons: the inadvisability of cutting into a large number of rami to expose the base of the crown, the difficulty of establishing a precise point from which to measure crown height and the presence of secondary cement which obscures the base of the crown.

A study of the mandibular dentitions of the immature individuals in the sample of *Texoceros* showed that distinct age groups were present. The entire sample, therefore, was divided into groups based on the criteria mentioned previously and the minimum number of individuals in each group was determined using the method described by Voorhies (1969). Approximate absolute ages were assigned to each group by comparing the replacement and wear patterns with similar patterns exhibited by known-age individuals of *Antilocapra* and estimated-age individuals of *Merycodus.*

The youngest age group represented in the *Texoceros* sample consists of a minimum of 18 individuals (26 specimens). At this age, dP_{2-4} are in wear. The anterior cusp of dP_4 is worn flat but the other two cusps are virtually unworn. M_1 is erupting but it does not yet show any signs of wear. In *Antilocapra*, M_1 has completely erupted at 44 days so individuals of the first age group of *Texoceros* must be younger. An age of one month has been arbitrarily assigned to this group.

The second age group is represented by a minimum of 4 individuals (10 specimens). At this age, the deciduous premolars are all still present in some specimens. In the remaining specimens where that area is preserved, the teeth are missing but it is not clear whether or not they had been lost before death. P_3 is visible in the alveolus but it has not yet erupted. M_{1-2} have erupted and are worn. M_3 is erupting. There is a distinct break between this stage and the previous stage. During this interval, M_2 erupts completely and begins to wear and M_3 begins to erupt. No specimens of *Texoceros* are present in the sample which would represent such an intermediate stage. At 14 months, the posterior cusps on M_3 of *Antilocapra* are beginning to erupt. M_3 of *Merycodus* begins to erupt at 9½ months. This second group of *Texoceros,* therefore, appears to consist of animals about one year old.

The next *Texoceros* group consists of 16 individuals (36 specimens). All of the deciduous premolars have been replaced by permanent premolars and M_3 is nearly fully emergent. Once again, there are no forms intermediate between this stage and the previous stage. It is at this stage that the fossettes on the molars begin to disappear. Both of the fosettes on M_2 are present; M_3 (except in one specimen) has three fossettes present. In some cases, the first (and in one case, the second) fossette is absent from M_1. By comparison with *Antilocapra* and *Merycodus,* these individuals appear to have been about two years old.

The fourth group consists of 33 individuals (68 specimens). This group is characterized by the absence of both fossettes on M_1 and the third fossette on M_3. Fossettes are occasionally absent from the first (and second) lobe of M_2. The sequence in which the fossettes are lost is fairly rigid. In all cases but one, both fossettes are lost from M_1 before the third fossette is lost from M_3. Only after this fossette is lost do the fossettes on M_2 begin to disappear. The

remaining fossettes on M_2 and M_3 are lost in order of the position in the tooth row, from anterior to posterior. It is more difficult to age individuals on the basis of fossette loss than on tooth replacement. Group 4 appears to represent both 3- and 4-year-old individuals. The large number of individuals present in this group also suggests that more than one age group is represented.

The fifth group is represented by 7 individuals (13 specimens). All of the fossettes have been lost except for the second (and in some cases, the first) on M_3. The teeth are well worn but not as worn as in the following group. The fossettes on M_2 in some *Antilocapra* have disappeared by the time the animal has reached an age of 5 and by 6, three or fewer fossettes are present on the molars. Thus, individuals of this group of *Texoceros* appear to have been about five years old.

The last group is represented by 5 individuals (8 specimens). The teeth are very well worn. In seven specimens, all of the fossettes are gone. The remaining specimen retains the second fossette on M_3. These individuals would have been at least six years old.

While the exact ages ascribed to the older *Texoceros* groups may be questionable, there seems to be little doubt that at least the first three groups represent distinct age classes with a difference of about one year between these groups. If such gaps exist between the younger groups, it is reasonable to assume that they exist between the older groups. The presence of distinct age groups is the result of catastrophic mortality rather than attritional mortality and it is only logical to assume that a single sample does not contain a catastrophic assemblage of young animals and an attritional assemblage of older animals.

The sample of *Texoceros* from Gd-10 appears to be the result of a single catastrophe which killed both young and old individuals during a short period of time in the late spring or early summer when the fawns were about one month old.

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LITERATURE CITED

Dow, Sumner A., Jr. and Philip L. Wright. 1962. Changes in mandibular dentition associated with age in pronghorn antelope. J. Wildlife Mgmt. 26(1):1-18.

Kent, Douglas C. 1963. A late Pliocene faunal assemblage from Cheyenne County, Nebraska. Unpublished M.Sc. thesis, Univ. Nebraska Dept. Geol.: 1-143.

Riney, T. and G. Child. 1960. Breeding season and aging criteria for the common duiker (*Sylvicapra grimmia*). Proc. First Fed. Sci. Cong. Salisbury: 291-299.

Voorhies, Michael R. 1969. Taphonomy and population dynamics of an early Pliocene fauna, Knox County, Nebraska. Wyoming Cont. Geol. Special Paper 1: 1-143.