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# Upper Canines in Dall's Sheep (*Ovis dalli dalli*)

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The presence of vestigial upper canines has been reported in bighorn sheep (*Ovis canadensis*) of North America (Benson, 1943, Am. Midl. Nat. 30: 786–789; Dalquest and Hoffmeister, 1938, Trans. Kans. Acad. Sci. 51: 224–234; Deming, 1952, Calif. Fish Game 38: 523–529; Allred and Bradley, 1965, Desert Bighorn Council Trans. 9: 75–81). Dalquest and Hoffmeister (1948, op. cit.) observed six skulls with upper canines from a sample of 37 bighorn skulls from the State of Washington (USA). Deming (1952, op. cit.) found that four of 11 lamb skulls from the State of Nevada Desert Game Range (USA) had upper canines, but none was found in 35 adult skulls. Allred and Bradley (1965, Desert Bighorn Council Trans. 9: 75–81) observed upper canines in one of 132 ram and none in 95 ewe skulls examined at the State of Nevada Desert Game Range. They observed a small flattened canine tooth on the left side of the maxilla and reported that it most likely did not protrude above the gingiva.

One hundred thirty ram and 81 ewe skulls of Dall's sheep were examined for canines from museum collections at the American Museum of Natural History,

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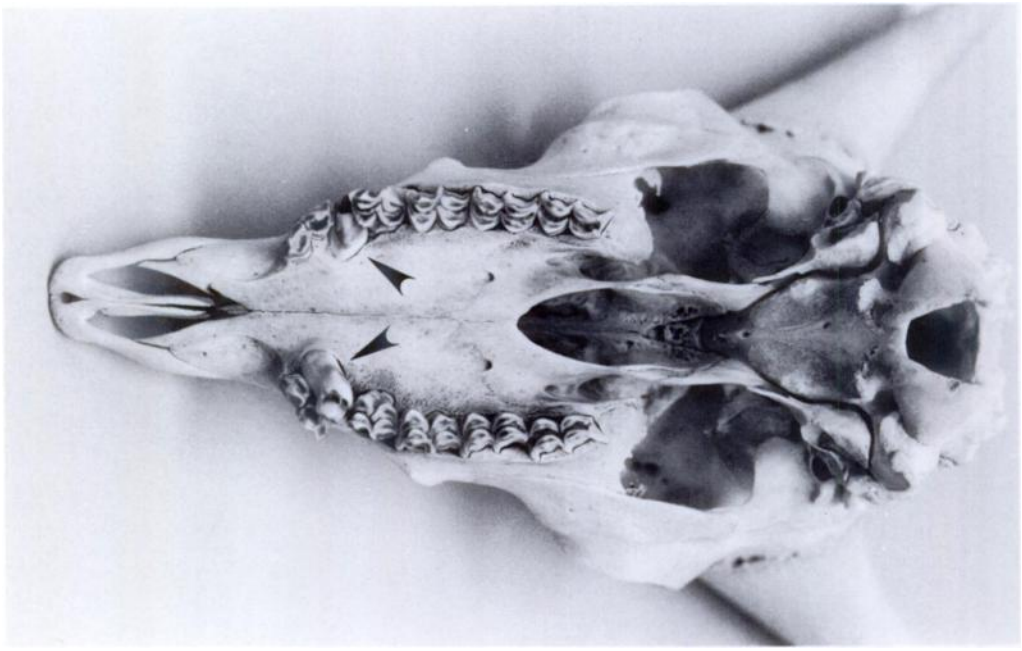


FIGURE 1. Skull of mature Dall's sheep ram. Note well developed upper canines (arrows). The first two pairs of premolars have been displaced.

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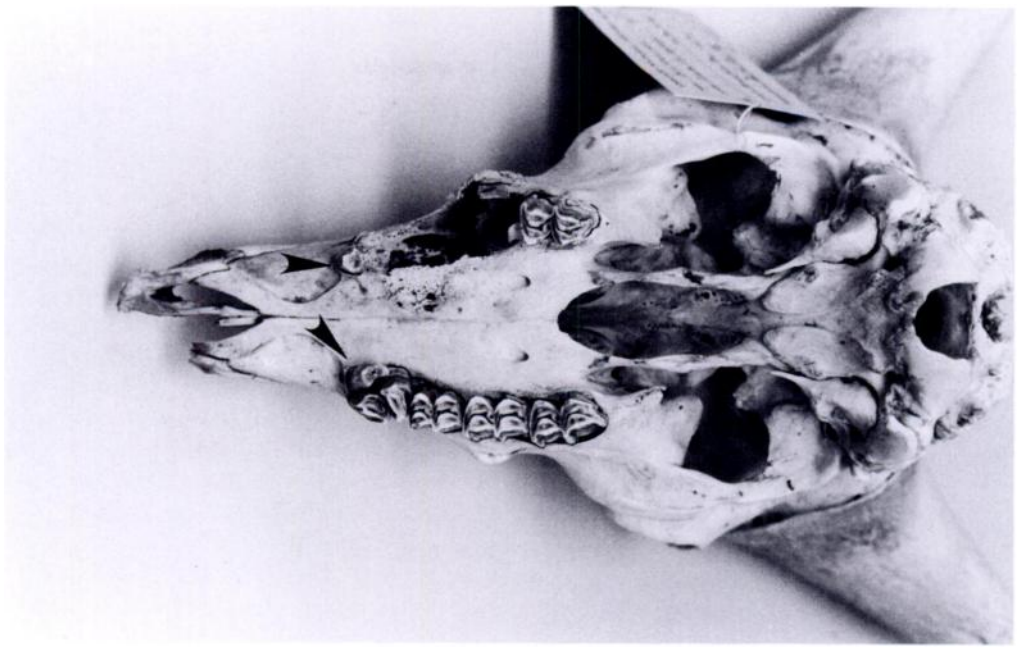


FIGURE 2. Skull of Dall's sheep ram. Both canines (arrows) are well developed, and the premolars on the right side have been displaced. The premolars and the first two pairs of molars are missing on the left side.

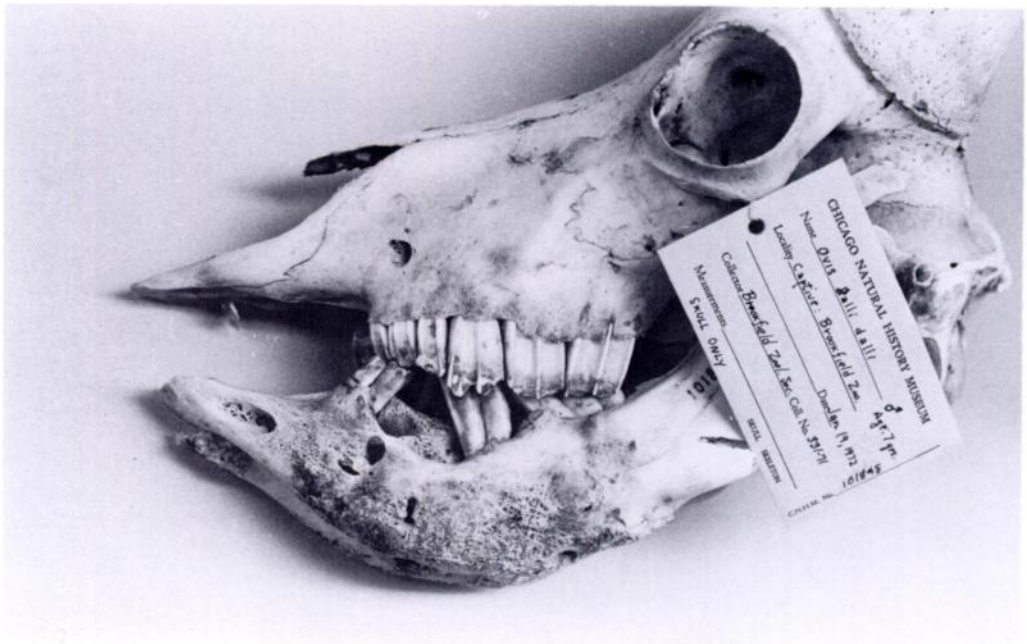



FIGURE 3. Lateral view of the tooth arcade of skull of ram described in Figure 1. The mandible had been greatly enlarged with its associated teeth being either displaced or missing, a major section of the bone is porous and there are numerous fistulous tracts.

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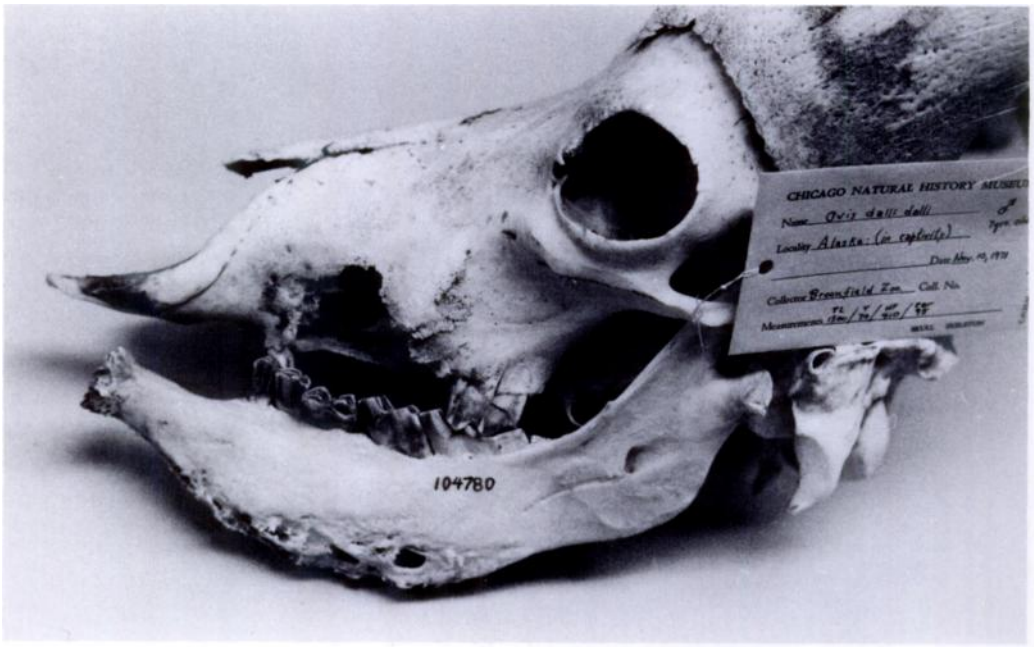



FIGURE 4. Lateral view of ram described in Figure 2. Note the fistulous tracts on mandible. Extensive osteolysis has occurred in the maxilla.

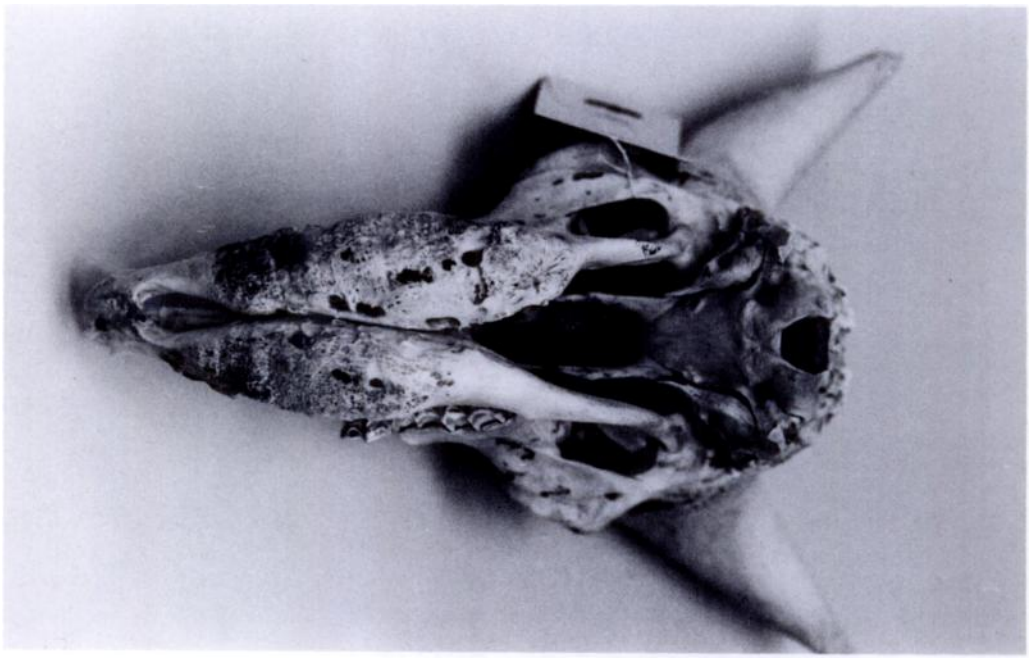


FIGURE 5. Hypertrophy of mandible, osteolysis and fistulation in skull of ram shown in Figures 1 and 3.

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Chicago, Illinois 60600, USA; the National Museum of Natural History, Washington, D.C. 20560, USA, and the Museum of Natural History, University of Alaska, Fairbanks 99701, USA. Of these, two rams that died at the Brookfield Zoo, Chicago, Illinois 60600, USA and whose skeletons were placed in the Field Museum of Natural History were observed to have prominent and well developed upper canines (Figs. 1 and 2). The protruding canines had disrupted the alignment of the upper premolars. This malalignment appeared to be associated with displaced and missing teeth of the maxillary and mandible (Figs. 3 and 4).

The canines were rounded instead of laterally compressed as is characteristic of the premolars and molars in *Ovis*. The ends of the canines were worn evenly with the premolars, a situation that appeared to have resulted from abrasion at the point of occlusion with the lower premolars.

Glaze et al. (1982, J. Wildl. Dis. 18: 305–309) postulated that "lumpy jaw" in Dall's sheep is commonly associated with abnormal wearing of teeth and a disrupted alignment of the tooth arcade. Both rams in the present case report had well developed "lumpy jaw," missing and displaced teeth, osteolysis with loss of trabecular and cortical bone, and fistulation of the mandible (Fig. 5). The persistence of upper canines, as observed in these skulls, would likely lead to "lumpy jaw" in wild populations of Dall's sheep. The prevalence of such occurrences, however, appears to be very low based on our review of museum specimens. This conclusion is further supported by Hoef's (1974, Can. Field Nat. 88: 227–229) report that only one of 400 Dall's sheep skulls examined from populations of sheep from Yukon Territory, Canada had supernumerary molariform teeth. The higher occurrence (2 of 6 skulls) in specimens from the Brookfield Zoo sheep was most likely a factor of inbreeding. Twenty-four of the 211 skulls (11%) examined in this survey had "lumpy jaw," however only two of the affected specimens had supernumerary teeth. "Lumpy jaw," therefore, would not usually be associated with upper canines.

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## Dental Abnormalities in Free-Ranging Cape Mountain Zebras (*Equus zebra zebra*)

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Dental abnormalities in animals are often artifacts of their domestication or captivity, e.g., crib biting in horses resulting in uneven wearing of the incisors (Jubb and Kennedy, 1970, Pathology of Domestic Animals, Vol. 2, Academic Press, New York, 697 pp.). Little has been documented on dental abnormalities in free-ranging wild animals, especially of the African species, although some descriptions were included in a general survey based on mu-

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