

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FOSSIL BEAR FROM OHIO.*

BY GERRIT S. MILLER, JR.

The United States National Museum has recently purchased from Mr. W. G. Roberts, of Middletown, Ohio, the skull of an extinct bear found by workmen on the farm of a Mr. Sommers, near Overpeck Station, on the C. H. & D. R. R., four miles from Hamilton, Butler County, Ohio. In regard to the discovery of the specimen, Mr. Roberts writes: "The man who found it was digging a well. When twenty-three feet from the surface he found the skull lying on what appeared to be a nest of petrified sticks." Attempts to secure some of these 'petrified sticks' have thus far failed.

The skull, that of a very aged individual, probably a female, represents a species somewhat smaller than a black bear. It lacks the lower jaw, but is otherwise only slightly imperfect. Part of the left zygomatic arch is missing, and the left occipital condyle is broken away. These injuries are of ancient date. The posterior region of the palate was crushed in by the shovel or pick that dislodged the skull from the gravel in which it was imbedded. At the same time the occiput was severely cracked and the right zygomatic arch broken. The pieces, however, fit together accurately. Six teeth remain in place—the canines, the posterior premolars, and the posterior molars. All traces of tubercles had been worn from the crowns of the grinding teeth before the animal's death.

The skull differs from that of any living American bear in its long, low rostrum, deeply concave forehead, small braincase,

* Published by permission of the Secretary of the Smithsonian Institution.

and large cheekteeth. The extinct North American species hitherto described are *Arctodus pristinus* Leidy, *Ursus amplidens* Leidy, *U. americanus fossilis* Leidy, *Arctotherium simum* Cope, and *Ursus haplodon* Cope. These may be examined chronologically.

Arctodus pristinus Leidy (Proc. Acad. Nat. Sci. Philadelphia, VII, p. 90, June, 1854), from the sands of the Ashley River, South Carolina, is a small-toothed species in no way closely related to that represented by the Ohio specimen.

Ursus amplidens Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p. 168, November, 1856), from "a ravine in the vicinity of Natchez, Mississippi," is known from a penultimate upper molar, and a left mandibular ramus with the posterior tooth in place. The specimen is thus exactly complementary to the Ohio skull. The only common ground for comparison between the two is the size of the molar figured by Leidy and the space formerly occupied by the homologous tooth in the Ohio specimen. Although the two correspond in a general way, this fact alone is obviously insufficient to establish specific identity.

Ursus americanus fossilis Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p. 169, November, 1856), discovered in the same ravine that contained the remains of *Ursus amplidens*, is a small-toothed bear closely related to the existing black bears, though probably distinct from any recent species.

Arctotherium simum Cope (American Naturalist, XIII, p. 791, December, 1879; *ibid.*, XXV, p. 997, November, 1891), from Shasta County, California, is readily distinguishable from the Ohio specimen by its generic characters and exceedingly short rostrum.

Ursus haplodon Cope (Proc. Acad. Nat. Sci. Philadelphia, 1896, p. 383), from Port Kennedy, Pennsylvania, is a very large animal, the jaws of which "exceed the average dimensions of the grizzly bear." Through the kindness of Mr. Witmer Stone I have been enabled to examine some of the material on which this species was based. This shows that the skull of *Ursus haplodon* was even more massive than that of the grizzly bears, and therefore nearly double the weight of the Ohio specimen, with which, therefore, the species requires no special comparison.

The animal represented by the Ohio specimen, as none of the names based on fossil North American bears are applicable to it, may be called :

Ursus procerus sp. nov.

Type No. 4214, United States National Museum.

General characters.—Skull about as long as that of the black bears (*e. g.*, *Ursus americanus* and *U. floridanus*), but much more slender. Braincase smaller and rostrum larger than in the black bears. Forehead deeply concave. Canine teeth as in *Ursus americanus*, but molars fully as large as those of *Ursus arctos* and the grizzly bears.

Skull.—Viewed from above, the skull of *Ursus procerus* differs from that of *U. americanus* and *U. floridanus* principally in the position of the post-orbital processes relatively to the total length of the skull. In the black bears the distance from the tip of the nasals to a line joining the tips of the postorbital processes is contained nearly or quite twice in that from the latter point to inion. In *U. procerus* it is contained barely one and one-half times. Postorbital processes short and blunt. Antinion broader and longer than in *U. americanus*, strongly concave anteriorly, very little elevated laterally and posteriorly. The horizontally expanded basal region of the zygoma is about as broad as in *U. americanus*, but the shelving portion of the squamosal behind the zygoma is much narrower and more concave. The zygomatic arch as a whole stands out more widely from the side of the skull than in *U. americanus*. In this respect it suggests the grizzly bears.

Viewed from the side, the striking peculiarities of the skull become fully apparent. The rostrum is so long, and its dorsal outline so nearly parallel with the alveoli, that, combined with the general length and shallowness of the braincase, it gives the skull a strongly canine aspect. Distance from posterior border of infraorbital foramen to front of premaxilla nearly one and one-half times depth of rostrum through infraorbital foramen. In *Ursus americanus* and *U. floridanus* the same distance scarcely exceeds the depth. The zygomatic arch as a whole does not differ noticeably from that of *U. americanus*, though its anterior base appears to be somewhat more lightly built. Braincase long and low. Occipital condyle larger than in the black bears (fully as large as in *U. horribilis*) and standing out much more conspicuously behind the paroccipital process. Sagittal crest and lambdoid crest well developed, but not unusually large. Inion strongly overhanging.

Viewed from beneath, the most striking peculiarities of the skull of *Ursus procerus* are the length and breadth of the palate and the narrowness of the occipital region. The palate is nearly as long and fully as broad as in the skull of a grizzly bear the basal length of which is 40 mm. greater than that of *U. procerus*. The hinder part of the palate is so much injured that its exact form cannot be determined; but so far as the fragments may be taken as a guide the posterior palatal region did not differ appreciably from the corresponding part of the black bear's skull. Interpterygoid fossa wider than in *Ursus americanus*. Distance from median line of basioccipital to outer side of mastoid process 12 mm. less than in the type skull of *Ursus floridanus* with approximably equal basal length. Audital bullæ smaller than in *U. americanus* and *U. floridanus*, but not different in form. Glenoid fossa as in *U. americanus*.

The occiput, viewed from behind, is narrower and lower than in the black bears. This increases the apparent size of the zygomatic arches.

Teeth.—The teeth are so worn that all trace of their tuberculation is lost. In form they do not appear to differ noticeably from those of *U. americanus*. In size, however, the molars and premolars fully equal those of *Ursus horribilis*, though the canines are no larger than in a specimen of *U. americanus*, and considerably smaller than in the skull of *U. floridanus* to which reference has already been made.

Measurements.—The following measurements were taken with dividers. They therefore in no case follow the outline of the bone.

- Greatest length 317. Basal length 290. Basilar length (estimated) 273.
 Tip of nasals to line joining tips of postorbital processes 110.
 Inion to line joining tips of postorbital processes 173.
 Zygomatic breadth 176. Mastoid breadth 124.
 Breadth across postorbital processes 97.
 Breadth of rostrum across bases of canines 68.
 Least breadth of rostrum 63. Lachrymal breadth 75.
 Greatest breadth of braincase above roots of zygomata 92.
 Fronto palatal depth (opposite anterior base of first molar) 53.
 Occipital depth between audital bullæ 80.
 Breadth of palate between posterior ends of last molars 45.
 Breadth of palate at (and including) anterior ends of last molars 79.
 Least breadth of palate between second premolars 45.
 Length of palate from gnathion to plain of posterior edges of last molars 130. Greatest width of interpterygoid fossa 32.
 Length of glenoid fossa 48. Length of occipital condyle 36.
 Breadth of occipital condyle 16.6. Length of audital bulla 40.6.
 Canine at edge of alveolus 20 x 13. Diastema 21.
 Distance from anterior edge of large premolar to posterior edge of last molar (crowns) 73. The same (alveoli) 72.
 Crown of large premolar 16 x 13. Alveolus of anterior molar 21.8 x 15.4.
 Space between crowns of large premolar and posterior molar 23.
 Crown of last molar 36 x 18.8.

Remarks.—*Ursus procerus* represents a type of bear, quite different from those found among living members of the genus, characterized by elongation and depression of the rostrum accompanied by reduction in the braincase. While the rostrum is lengthened and broadened to dimensions equal to those of the corresponding parts in the grizzly bears, its depth is even less than in the black bears, which the animal as a whole probably resembled in size. Though the canines are small, the molar teeth are probably relatively larger than in any other known bear. This disproportion in the sizes of the canines and molars may be partly sexual, if I am right in supposing that the type skull is that of a female. The characters of the skull and teeth are all opposed to those of the species of *Arctotherium*. With the other extinct American bears no close comparison can be made. *Ursus procerus* is not nearly related to the living black bears or grizzly bears. Of neither of these can it be regarded as a directly ancestral type.