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HESPEROPITHECUS, THE FIRST ANTHROPOID PRIMATE FOUND IN AMERICA

IT is hard to believe that a single small water-worn tooth, 10.5 mm. by 11 mm. in crown diameter, can signalize the arrival of the anthropoid Primates in North America in Pliocene time. We have been eagerly anticipating some discovery of this kind, but were not prepared for such convincing evidence of the close faunal relationship between eastern Asia and western North America as is revealed by this diminutive specimen. The entire credit for the discovery belongs to Mr. Harold J. Cook, consulting geologist, of Agate, Nebraska, who has been contributing for many years to our knowledge of the extinct fauna of Nebraska through both his discoveries and his writings. He wrote to the present author (February 25, 1922):

I have had here, for some little time, a molar tooth from the Upper, or Hipparion phase of the Snake Creek beds, that very closely approaches the human type. It was found associated with the other typical fossils of the Snake Creek, and is mineralized in the same fashion as they are. I sent a brief description of this to Professor Loomis a short time before the Amherst meeting of this year, with a request that it be read at that time, if opportunity offered. The manuscript was returned to me here immediately after the meetings, but with no notation as to whether it was read or not, or presented at that time in any fashion.

Inasmuch as you are particularly interested in this problem and, in collaboration with Dr. Gregory and others, are in the best position of any one to accurately determine the relationships of this tooth, if it can be done, I will be glad to send it on to you, should you care to examine and study it. Whatever it is, it is certainly a contemporary fossil of the Upper Snake Creek horizon, and it agrees far more closely with the anthropoid-human molar, than that of any other mammal known.

On receiving the tooth, the author telegraphed (March 14, 1922): "Tooth just arrived safely. Looks very promising. Will report immediately." A letter followed the same day:

The instant your package arrived, I sat down with the tooth, in my window, and I said to myself: "It looks one hundred per cent. anthropoid." I then took the tooth into Dr. Matthew's room and we have been comparing it with all the books, all the casts and all the drawings, with the conclusion that it is the last right upper molar tooth of some higher Primate, but distinct from anything hitherto described. We await, however, Dr. Gregory's verdict to-morrow morning; he certainly has an eagle eye on Primate teeth. . . . We may cool down to-morrow, but it looks to me as if the *first anthropoid ape of America* had been found by the one man entitled to find it, namely, Harold J. Cook!

On March 22, 1922, the author wrote:

We believe we have found another one of the teeth, very much worn, of the same animal, which, so far as it goes, is confirmatory. The animal is certainly a new genus of anthropoid ape, probably an animal which wandered over here from Asia with the large south Asiatic element which has recently been discovered in our fauna by Merriam, Gidley and others. It is one of the greatest surprises in the history of American paleontology and I am delighted that you are the man who found it. Our specimen is unrecognizable, it is so much worn.

The tooth arrived with the following label:

One Molar Tooth, ?Anthropoid, No. HC425, Collection of Harold J. Cook, Agate, Nebraska. Found in Upper Phase of Snake Creek Beds, Typical Locality, in position in gravels with other fossils.

Following the examination by Dr. William D. Matthew and the author, who determined the tooth as a second or third upper molar of the right side of a new genus and species of anthropoid, the tooth was submitted to Curator William K. Gregory and Dr. Milo Hellman, both of whom have made a special study of the collections of human and anthropoid teeth in the American Museum and the United States National Museum. They reported (March 23, 1922) as follows:

1. Such a degree of wear is very rarely seen on m^3, and in view also of the marked difference in form of m^3, we rather incline to the opinion that it is an m^2. 2. The kind of wear shown in this tooth, which has an evenly concave surface (without humps representing the para- and metacones), has never been seen in an anthropoid tooth, and we are of the opinion that even in very old chimpanzees the outer half of the crown will be unevenly worn. 3. The nearest in point of wearing surface is the supposed m^2 attributed to *Pithecanthropus*, also in form of roots. The strong hypocone in "*Pithecanthropus*" and the absence of hypocone in the new specimen is not positively diagnostic, in view of the immense differences in the hypocone, both in apes and man. 4. On the whole, we think its nearest resemblances are with "*Pithecanthropus*" and with men rather than with apes.

On the basis of these very careful studies, the author decided to make this tooth the type of the following new genus and species:

Hesperopithecus haroldcookii,[1] new species

This second upper molar tooth is very distant from the gorilla type, from the gibbon type, from the orang type; among existing anthropoid apes it is nearest to m^2 of the chimpanzee, but the resemblance is still very remote. It is excluded from close affinity to the fossil Asiatic anthropoid apes, such as *Dryopithecus punjabicus*, *Palæopithecus sivalensis*, and *Sivapithecus*, recently related to the human stem by Pilgrim. Its transverse diameter of 11 mm. is greater than its anteroposterior diameter of 10.5 mm. In the corresponding human tooth, m^2, of an American Indian, with which it is compared in Fig. 2, the transverse diameter is 12.5 mm., the anteroposterior diameter is 11 mm. Thus the proportions of the molar crown of the *Hesperopithecus* type are about the same as those in the *Homo sapiens mongoloideus* type. There is also a distant human resemblance in the molar pattern of *Hesperopithecus*, as very skilfully portrayed (Fig. 1)[2] by the artist, Mrs. L. M. Sterling, to the low, basin-shaped, channeled crown in certain examples of *Homo sapiens*. But the *Hesperopithecus* molar cannot be said to resemble any known type of human molar very closely. The author agrees with Mr. Cook, with Dr. Hellman, and with Dr. Gregory, that it resembles the human type more closely than it does any known anthropoid ape

[1] The names signify an anthropoid of the Western World discovered by Mr. Harold J. Cook.

[2] The illustrations will be published by the American Museum of Natural History.

type; consequently it would be misleading to speak of this *Hesperopithecus* at present as an anthropoid ape; it is a new and independent type of Primate, and we must seek more material before we can determine its relationships. It is certainly not closely related to *Pithecanthropus erectus* in the structure of the crown, for *Pithecanthropus* has a single, contracted crown in which the superior grinding surface has a limited crenulated basin, whereas *Hesperopithecus* has a widely open crown with broadly channeled or furrowed margins, and a postero-internal crest suggesting the hypocone of a higher Primate form. The disposition of the roots in *Hesperopithecus*, in *Homo*, in *Pithecanthropus*, is shown to be very broadly similar in comparative Fig. 2. The *Hesperopithecus* molar is three-fanged, the postero-external fang having been broken off in the type; the internal fang shows a median internal groove and a tendency to a deep external groove on the outer side.

Since 1908 there has been in the American Museum collection from this same horizon another small water-worn tooth, discovererd by Dr. William D. Matthew. The specimen belonged to an aged animal and is so water-worn that Dr. Matthew, while inclined to regard it as a Primate, did not venture to describe it. It now appears, from close comparison with the type of *Hesperopithecus*, to be closely related generically, even if it is not related specifically. The greatly enlarged drawing (Fig. 3), reproduced to the same scale as that of the type above described, shows that the molar pattern is fundamentally similar. The crown differs in its much more triangular form and, were it not for its extremely worn surface, we should unhesitatingly pronounce it as a third superior molar; it has, therefore, been given this position provisionally in the diagram; it seems to confirm the opinion of Gregory and Hellman that the type of *Hesperopithecus* is a second superior molar.

The geologic age of these two specimens is now believed to be the same as that of Thousand Creek, Nevada, and Rattlesnake, Oregon, among the fauna of which *Pliohippus* is very abundant and varied; it also contains *Ilingoceras* and other strepsicerine antelopes of Asiatic affinity; it is the last American fauna in which occurred the rhinoceros, preceding the Blanco fauna in which the Asiatic brevirostrine *M. mirificus* first occurs.

HENRY FAIRFIELD OSBORN
AMERICAN MUSEUM
OF NATURAL HISTORY,
NEW YORK, N. Y.

MEDALS AND DINNER OF THE NATIONAL ACADEMY OF SCIENCES

AT the annual dinner of the National Academy of Sciences, held at the Hotel Powhatan on Tuesday evening, April 25, 1922, two medals were awarded.

The J. Lawrence Smith Medal was bestowed upon Dr. George P. Merrill, curator of geology at the United States National Museum. This is a gold medal of the value of $200, from a fund established in 1884, as a reward for "original investigation of meteoric bodies." But because investigators in this field are so rare it has not been given since 1888. Dr. Whitman Cross, in his speech presenting the medal, pointed out that Dr. Merrill had continued to carry on the work of his predecessor, J. Lawrence Smith, on meteorites by the application of modern methods of analysis. The earlier analyses of meteorites were not always to be relied upon, and Dr. Merrill in his long years of research has been able to show that some of the elements previously reported as having occurred in meteorites are absent and, at the same time, he has extended the list of elements and compounds that do exist in these bodies. Among other minerals he has found a calcium phosphate similar to apatite, which has been named in his honor Merrillite. Dr. Merrill also has discovered evidences of metamorphism in meteorites, cases where a mineral structure has been broken up and the fragments later fused together like the conglomerates found in igneous rocks in the earth's crust.

Dr. Merrill in receiving the medal said that meteorites had in all ages attracted a great deal of popular interest. In the earliest times they were worshipped as divine and nowadays the newspapers give great attention to any meteoric fall. Yet few scientists have made them the subject of concentrated and long-continued study. In his work, Dr. Merrill said