

The role of "Nebraska Man" in the creation/evolution debate

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In 1922, solely on the basis of a worn fossil tooth from Nebraska, paleontologist Henry Fairfield Osborn described *Hesperopithecus* (*Hespero*=western+ *pithecus*=ape, ACM) *haroldcookii* as the first anthropoid ape from North America. Five years later, Osborn's colleague William King Gregory concluded that the tooth most likely came from an extinct peccary. During its brief life, *Hesperopithecus* provoked intemperate speculations about its relation to humans, including a "reconstruction" of "Nebraska Man" by an artist in a popular British news magazine. The Nebraska tooth also sparked some memorable exchanges between Osborn and William Jennings Bryan, from whose home state the tooth had come. Osborn apparently began to have doubts about his identification of the tooth shortly before the Scopes "monkey trial" in July 1925, and he stopped mentioning it in his publications. It seems likely that the crumbling of the Fundamentalist assault on evolution in the years following the Scopes trial prevented the *Hesperopithecus* affair from becoming a serious embarrassment to evolutionists. Although Nebraska Man did not survive long enough to become widely accepted by the scientific community and was quickly forgotten when its true identity was recognized, *Hesperopithecus* is again being trotted out in the current recrudescence of creationist attacks on evolution. The creationists who belittle mistakes by scientists cannot admit that science advances, in part, by correcting error.

Discovery, Debate, Doubt, and Downfall

In 1917, rancher and geologist Harold Cook collected a human-looking tooth in Pliocene (recently redesignated Miocene) sediments in northwestern Nebraska. In March 1922, Cook submitted the specimen to Henry Fairfield Osborn, President of the American Museum of Natural History and an eminent vertebrate paleontologist, to determine the tooth's affinities.

Osborn received the tooth on March 14, 1922. He wrote to Cook: "I sat down with the tooth and I said to myself: 'It looks one hundred per cent anthropoid'." (Osborn, 1922b, p. 2) One month later, Osborn announced *Hesperopithecus haroldcookii* as the first anthropoid ape from America.

The tooth that became the "Ape of the Western World" has a virtually featureless crown surface, and the comparison with anthropoid teeth depended heavily on size and general shape. Osborn, however, did not attempt to bury the meager evidence of *H. haroldcookii* in a drawer at the American Museum. He had casts made of the tooth and sent them to 26 institutions in Europe and the United States. (Anon., 1924a)

Even after seeing one of the casts, British paleontologist Arthur Smith Woodward, who had given the world Piltdown Man, was highly skeptical, feeling that "The occurrence of a man-like ape among fossils in North America seems so unlikely that good evidence is needed to make it credible." (Woodward, 1922)

Despite Woodward's doubts, British anatomist Grafton Elliot Smith acknowledged *Hesperopithecus* as the third known genus of extinct hominids, along with *Eoanthropus* and *Pithecanthropus* (Smith, 1922), and also became an accomplice to an imaginative artistic

reconstruction of *Hesperopithecus* that appeared in the *Illustrated London News*. (Forestier, 1922) Given a large spread on the two pages preceding an article by Smith, the drawing shows a pair of very human-looking "*Hesperopithecus*" individuals hunting for their next meal. In the background, as Smith narrated, are various Pliocene mammals whose remains had been recovered from the same strata that yielded the *Hesperopithecus* tooth.

The artist, Amedee Forestier, explained that he modeled *Hesperopithecus* after "*Pithecanthropus*, the Java ape-man, whose proportions and attitude were those of the average Englishman." (Forestier, 1922, p. 943) Osborn and his colleagues at the American Museum were not impressed with Forestier's handiwork and felt that "such a drawing or 'reconstruction' would doubtless be only a figment of the imagination of no scientific value, and undoubtedly inaccurate." (Anon., 1922) Forestier's black-and-white drawings, especially dealing with archeological and anthropological discoveries, were featured in the *Illustrated London News* in the first three decades of the century. One of his earlier reconstructions had been of Piltdown Man. When the artist died in 1930, a friend paid too-generous tribute when asserting that "Forestier was especially interested in prehistoric man and love to bring him to life, not by fictitious imaginings but by the most careful reconstructions based on scientific research." (Q., 1930)

Forestier's reconstruction of Nebraska Man was not reproduced in any other contemporary publication and has only recently been "rediscovered" and reprinted by critics of evolution (e.g., Hitching, 1982; Bowden, 1981; see also Fix, 1984).

The argument over *Hesperopithecus*, especially in England, left Osborn scrambling for the middle ground. "Every discovery directly or indirectly relating to the pre-history of man attracts world-wide attention and is apt to be received either with too great optimism or too great incredulity," Osborn observed. "One of my friends, Prof. G. Elliot Smith, has perhaps shown too great optimism in his most interesting newspaper and magazine articles on *Hesperopithecus*, while another of my friends, Dr. A. Smith Woodward, has shown too great incredulity . . ." (Osborn, 1922d, p. 281)

Osborn was willing to settle for an anthropoid ape, even if it was not a direct human ancestor. He put a respected colleague, William King Gregory, in charge of defending *Hesperopithecus*. Gregory, an unquestioned authority on fossil primates, compared the type tooth with Old World monkeys and apes and concluded that the Nebraska tooth "combines characters seen in the molars of the chimpanzee, of *Pithecanthropus*, and of man, but . . . it is hardly safe to affirm more than that *Hesperopithecus* was structurally related to all three." (1923a, p. 14) In a second paper in 1923, Gregory backed off his earlier assertion that *Hesperopithecus* showed human affinities and suggested that "the prevailing resemblances of the *Hesperopithecus* type are with the gorilla-chimpanzee group." (Gregory and Hellman, 1923b, p. 518)

Thus, even during the "reign" of *Hesperopithecus* as a putative human ancestor, many scientists, including its discoverer (Osborn) and its chief defender (Gregory), did not go as far as Elliot Smith in making overzealous extrapolations based on the Nebraska tooth.

Field work resumed in the spring of 1925 at the site where Cook had found the original *Hesperopithecus* tooth in 1917. It was material uncovered at the site during 1925 that undoubtedly sowed the seeds of doubt about the true possessor of the Nebraska tooth. As evidence accumulated in subsequent field seasons, Gregory became aware that, despite the tooth's uncanny superficial resemblance to an anthropoid molar, *Hesperopithecus* was probably an extinct peccary. Gregory announced his retraction in *Science* at the end of 1927. (Gregory, 1927) The self-correcting feature of science thereby aborted America's only entry in

mankind's prehistoric lineage before Nebraska Man significantly affected opinions of most scientists regarding human evolution.

Gregory's change of heart on *Hesperopithecus* made front-page news in *The New York Times* (Anon., 1928a) and was picked up by *The Times of London* (Anon., 1928c). Editorial writers for both papers jumped at the chance to extract a lesson from the affair. *The New York Times* opined that

Professor Henry Fairfield Osborn and his colleagues can snatch consolation from the extinct jaws of the toothsome wild peccary. For science, as this incident shows, demands proof from even its most exalted. Nothing ever went through so many tests as this peccary molar from Nebraska. It survived them all, but then science went digging in the ancient river-bed again. . . . After which the whole business was "on the hog." (Anon., 1928b)

The Times of London also had some words to say about the "zeal for the discovery of ancestors, which is so often observed in the newly ennobled." (Anon., 1928d)

Despite the editorials, the scientific impact of Gregory's retraction of *Hesperopithecus* was remarkably light, especially in America. The scientist who seems to have been most offended was Grafton Elliot Smith, the English anatomist who had seized upon Osborn's announcement in 1922 and shamelessly promoted *Hesperopithecus* as a full-fledged human ancestor. Four years after the retraction, Smith, neglecting his own role in the affair, thought that, "It would be interesting and entertaining to discuss some of the false claims by over-enthusiastic searchers [for remains of fossil hominids . . . such as] the assumption that the tooth of a Pliocene peccary from Nebraska gave America the right to claim this 'Playboy of the Western World' (*Hesperopithecus*) as the earliest member of the Human Family." (Smith, 1931, p. 20)

French paleoanthropologist Marcellin Boule, who had expressed doubts about *Hesperopithecus* since the original announcement, seemed only too delighted to sympathize, "What bad luck for a fossil called on to play a major role in the history of prehumanity, but also what a lesson for paleontologists with too vivid an imagination." (Boule, 1928, p. 209) Long after other paleontologists had relegated *Hesperopithecus* to oblivion, Boule continued to remind the world, in a posthumous edition of his widely used textbook on human paleontology, that, "The Nebraska Ape-Man became a 'Pig-Man'." (Boule and Valois, 1957, p. 86)

Osborn, Hominids, and Peccaries

How could a worker as careful and methodical as Osborn have made such an egregious error?

Misidentifications and misallocations of fossil specimens are quite common in the paleontological literature. After publication, these errors are subject to examination by others in the field and corrections are made in print, usually without fanfare. Some of the misidentifications are ludicrous: a fossil whale first identified as a giant reptile, rodents misidentified as primates, carnivores as ungulates, ungulates as anteaters. The list is endless, but the public nature of science leads to quick corrections, particularly when the biological group in question is under intense study by a number of competing workers.

To prevent embarrassing errors when a new but incomplete fossil is found, most paleontologists and anthropologists will make a tentative identification of a specimen and await further discoveries for confirmation of their find. Overly cautious individuals await complete skeletons and may never publish their finds, whereas more reckless ones will establish new species, genera, and families on fragmentary evidence.

But was Osborn reckless? Why did he not make a more tentative identification of the ". . . single, small water-worn tooth . . ." (Osborn, 1922b, p. 1) that later became a cause celebre?

Three factors contributed to the mistaken identification of *Hesperopithecus* as a primate.

First, the circumstantial evidence of some of the other fossil specimens associated with *Hesperopithecus* made the existence of a North American Pliocene hominid a distinct possibility. A fossil antelope, an animal otherwise native to Africa and Asia, was discovered in the same strata that produced *Hesperopithecus*. If an antelope could migrate from the Old World tropics to North America in the Pliocene, why not a hominid?

Secondly, the sediments that yielded the tooth also contained abundant bone fragments and splinters that looked extraordinarily similar to bones that had been worked and shaped by unquestionable humans in the later Pleistocene (or Ice Age) of Europe. As it turned out, the "worked" fragments from Nebraska were produced when hyaena-like dogs crushed and split bones to obtain marrow, in the same way that African hyaenas feed today. To Osborn and his field workers, however, it looked as if a human culture existed and was preserved in these sediments.

Thirdly, the morphology of the fossil tooth itself was extremely deceptive. Even if one examines the tooth after reading all the literature about it, the tooth bears a compelling resemblance to human or hominid molar teeth, both in overall size and shape, and in the mode of wear on the tooth (the latter being the result of an abrasive diet and tooth-on-tooth contact). After comparing the Nebraska tooth with teeth of contemporary peccaries belonging to the species *Prosthennops crassigenus*, it is clear that the *Hesperopithecus* tooth is not an upper molar, as Osborn had thought, but a fourth upper premolar (a bicuspid in human dental terms). Keep in mind that all surface features, those essential to correct identification, had been virtually obliterated by heavy tooth wear during life and later by postmortem abrasion in the streams that deposited the sediments containing the *Hesperopithecus* tooth. The overall morphology of the *Hesperopithecus* tooth matches that of a *P. crassigenus* fourth premolar, but there is no similarity in the wear patterns of the two teeth. This is an important point, because the jaw motions of mammals are quite stable, and an animal that chews in a certain way would be very unlikely to change that mode of chewing and produce a novel wear pattern in its teeth. The only reasonable explanation is that the tooth of *Hesperopithecus* was rotated in the jaw in life, and that its odd position produced the primate-like wear pattern. This is not a totally ad hoc idea, because a 90 degree rotation about the long axis of a fourth premolar has been described and illustrated for the fossil peccary *Dyseohyus* sp. by Woodburne (1969, plate 51, fig. 1). Tooth rotation along all three axes has been described for a fossil carnivore (Mellett, 1977), so it is not an unexpected phenomenon in mammals, although it occurs only rarely.

Ironically, the similarity between peccary teeth and those of hominids had been noted 13 years before Osborn published his description of *Hesperopithecus*. In 1909, W. D. Matthew and Harold Cook had the following to say in describing *Prosthennops*: "The anterior molars and premolars of this genus of peccaries show a startling resemblance to the teeth of *Anthropoidea*, and might well be mistaken for them by anyone not familiar with the dentition of Miocene peccaries." (p. 390) Matthew was Osborn's younger colleague at the American Museum of Natural History, and there is no way that Osborn could not have known about this 1909 warning. Matthew said very little about the identification (rather, misidentification) of *Hesperopithecus* as a primate; his published comments on the tooth stressed its stratigraphic position rather than its affinities.

Nebraska Man, Bryan, the Scopes Trial, and Creationism

The consequences for science of the downfall of *Hesperopithecus* might have been more serious were it not for other substantial discoveries in the 1920's, especially *Australopithecus* and "*Sinanthropus*" (Peking Man), that helped shore up the argument for the evolution of humans from ape-like ancestors at a time when the concept of human evolution was being attacked by the likes of William Jennings Bryan.

In fact, Bryan played a pivotal role in the *Hesperopithecus* episode. At the end of a colorful political career, Bryan became an instant leader in the so-called Fundamentalist crusade against evolution in the early 1920's. In 1921, trying out arguments that would receive wider attention during the Scopes "monkey trial" in 1925, Bryan preached that, "The greatest enemy of the Bible is the numerous enemy, and the numerous enemy today is the believer in the Darwinian hypothesis that man is a lineal descendant of the lower animals." (Bryan, 1921, p. 19) "Darwin," Bryan continued, "gives us a family tree which begins in the water . . . and then traces the line of descent to European apes -- he does not even allow us the patriotic pleasure of descending from American apes." (1921, p. 39)

Osborn, in his role as an established American defender of evolution, went after Bryan in a March 5, 1922 article in *The New York Times*. (Osborn, 1922a) Osborn optimistically believed that, "If Mr. Bryan, with open heart and mind, would drop all his books and all the disputations among the doctors and study first-hand the simple archives of Nature, all his doubts would disappear; he would not lose his religion; he would become an evolutionist."

Osborn's answer to Bryan was published just nine days before the *Hesperopithecus* tooth arrived at the American Museum from Nebraska. The tooth seemed to be the very evidence he needed -- and from Bryan's home state! Here, perhaps, was the American ape that Bryan had chauvinistically and sarcastically wished for. Osborn's glee must not have been entirely scientific as he studied the tooth from Cook. Perhaps the opportunity to undercut Bryan colored Osborn's analysis of the tooth and perhaps induced him to rush into print prematurely.

We do know that Osborn gloated over this small, worn tooth. In his 1922 announcement before the National Academy of Science, Osborn remarked on the fact that the discovery had come so soon after he had "advised William Jennings Bryan to consult a certain passage in the book of Job, 'Speak to the earth and it shall teach thee,' and it is a remarkable coincidence that the first earth to speak on this subject is the sandy earth of the Middle Pliocene Snake Creek deposits of western Nebraska." (Osborn, 1922c, p. 246) Perhaps, he suggested mockingly, the animal should have been named *Bryopithecus* "after the most distinguished Primate which the State of Nebraska has thus far produced." (1922c, p. 246)

In May 1925 Osborn again picked up the theme of the earth speaking to Bryan. He then called on Bryan to honor his own dictum that Truth is Truth and must prevail. An element of Truth, Osborn argued, appeared as a diminutive tooth from Nebraska.

What shall we do with the Nebraska tooth? Shall we destroy it because it jars our long preconceived notion that the family of manlike apes never reached the western world . . . ? Or shall we continue our excavations, difficult and baffling as they are, in the confident hope, inspired by the admonition of Job, that if we keep speaking to the earth we shall in time hear a more audible and distinct reply? Certainly we shall not banish this bit of Truth because it does not fit in with our preconceived notions and because at present it constitutes infinitesimal but irrefutable evidence that the man-apes wandered over from Asia into North America. (Osborn, 1925a, pp. 800-801)

Almost on the eve of the Scopes trial, Bryan finally answered Osborn on the subject of the Nebraska tooth:

Professor Osborn is so biased in favor of a brute ancestry . . . that he exultantly accepts as proof the most absurd stories. . . . Each new exhibit, -- no matter how largely the product of an inflamed imagination, -- lifts him to a new altitude of exultation, and each one in itself furnishes him sufficient foundation for unchangeable convictions His latest "newly discovered evidence" is a long lost witness captured in Nebraska. He would probably have declared it "irrefutable" even if it had been found in some other State, -- all the evidence on his side seems "irrefutable" to him, -- but the fact that it was found in Nebraska, my home state for a third of a century, greatly multiplied its value. Some one searching for fossils in a sand hill came upon a lonely tooth The body of the animal had disappeared, and all the other pieces of "imperishable ivory" had perished; not even a jaw bone survived to supply this Sampson of the scientific world with a weapon to use against the Philistines of to-day. But a tooth in his hand is, in his opinion, an irresistible weapon. The finder of this priceless tooth, conscious that it could impose upon but a few, even among those who prefer speculation to reason, wisely chose Professor Osborn. He hastily summoned a few congenial spirits, nearly as credulous as himself, and they held a postmortem examination on the extinct animal, which had at one time been the proud possessor of this "infinitesimal" and "insignificant" tooth. After due deliberation, they solemnly concluded and announced that the tooth was the long looked-for and eagerly longed-for missing link which the world awaited. The Professor's logic leaks at every link, but it is no worse than that of his boon companions who, having rejected the authority of the word of God, are like frightened men in the dark, feeling around for something they can lean upon. (Bryan, 1925, pp. 104-105)

This spirited exchange sounded like a prelude to a spectacular confrontation between Osborn and Bryan at the Scopes trial. Osborn appeared to be gearing up for a clash with Bryan when, in a series of essays published in May 1925, he singled out the Great Commoner as the man who would be on trial in Tennessee (Osborn, 1925b). Late in June he was listed as one of eleven "scientists who will be called to testify in the defense of John T. Scopes." (Anon., 1925a)

Then a very odd thing happened, at least as far as the published record goes. As Boule (1928, p. 208) characterized it, "the silence descended" on *Hesperopithecus* at the end of June 1925. The Scopes trial was about to start, and a genuine American fossil hominoid from his home state could have, at the least, put Bryan and his colleagues on the prosecution on the defensive. Bryan, in fact, was prepared to take on Nebraska Man -- upon his arrival in Dayton on July 7, he repeated his comments belittling the "missing link" founded on a single tooth from Nebraska and, dredging up one of his favorite lines, told reporters that "these men would destroy the Bible on evidence that would not convict a habitual criminal of a misdemeanor." (Anon., 1925b, p. 6)

Five days later, just as the trial was beginning, Osborn produced another full-page defense of evolution in *The New York Times* (Osborn, 1925c). With Bryan's July 7 quote about the Nebraska tooth standing as a goad at the top of the article, Osborn nonetheless went through his entire argument without even a passing reference to *Hesperopithecus*.

What had happened? Quite simply, *Hesperopithecus* had come to the end of its short life, although most of the world would not learn of the demise for another two-and-one-half years. By mid-July, Osborn had undoubtedly received the first specimens from the renewed collecting at the *Hesperopithecus* discovery site. This material, as we have noted, probably caused doubts in the minds of Osborn and Gregory over the reality of *Hesperopithecus*. And what if Bryan had found out about the uncertain status of *Hesperopithecus*? If such doubts had been raised at the Scopes trial, it could have led to disastrous consequences for Scopes's defense and even for the public image of evolution. Clearly, it would have been best for Osborn to back off and stay out of reach in New York. So, having fulfilled his obligation to Scopes's defense with the July 12

piece in *The New York Times*, Osborn sat out the Scopes trial, not even submitting written testimony.

Hesperopithecus was not mentioned by anyone during the course of the Scopes trial, although other major discoveries of fossil hominids were discussed from the stand and in written testimony. Recent claims by Hitching that "the Hesperopithecus tooth was proudly displayed [at the trial] as evidence that man had a long evolutionary past" (1982, p. 211) are simply untrue; it is equally false that "the trial that became a significant turning point in U.S. educational history . . . was steered towards its verdict by a pig's tooth." (Hitching, 1982, p. 212)

With one minor exception, Osborn dropped all mention of Hesperopithecus in published works after July 1925, and Nebraska Man sank into oblivion without a great outcry. Bryan died on July 26, just five days after the end of the Scopes trial, leaving no one of his stature to assume the leadership role of the Fundamentalist crusade against evolution.

One who would have liked to be the leader of the opposition to evolution was John Roach Straton, pastor of Calvary Baptist Church in New York and a foe of Osborn's museum. In a letter to Osborn in 1924, Straton professed that he was "entirely friendly in my feeling toward the museum. The sole exception to this attitude in my mind is your so-called 'Hall of the Age of Man.' Frankly, I, for one, think that you ought to label that 'Our Humorous Department'." (Anon., 1924b)

Straton was no mere crank. Even into the early years of his ministry, he was a believer in evolution, but by 1924 he had become a strong and articulate opponent of evolution. In a famous debate with Charles Francis Potter in January 1924, Straton, deftly countering the pro-evolution arguments of his Unitarian foe, invoked his own strong resemblance to Woodrow Wilson to argue that similarity of appearance need not imply relation (Straton and Potter, 1924, p. 58).

Straton's 1924 battle with the Museum subsided, only to be rekindled shortly after the Scopes trial. But the Fundamentalists had failed to discredit evolution in Tennessee and Bryan was dead, so the attack on the Museum became bogged down.

Before his death in 1929, however, Straton had one final opportunity to chide Osborn. Shortly after Gregory's retraction, the minister suggested that the Nebraska tooth could be called "Hesperopigdonefoolem osborniicuckoo in honor of Mr. Osborn himself, who defended the tooth heatedly and, cuckoo-like said 'Me too' after gleeful dogmatic assertions of Cook, Gregory and others." Straton, of course, thought that the expose of Hesperopithecus "justifies my assertion of some time ago that evolution is the most gigantic bluff in the history of the human mind." (Straton, 1928)

The Fundamentalists should have gotten some good ammunition from the Hesperopithecus episode. Even the editor of *Scientific American* had to admit that, "It looks as if Straton had morally won this round and it might possibly work out a lot nicer if we of the scientific camp were to concede it gracefully and get ready for the next one." (Anon., 1928e) In the same note, Gregory was praised for the retraction, "knowing as he must have known, when he did it, that the story of the ape's tooth that was reduced in station to that of a Pliocene pig, would surely be triumphantly intoned in the songs of hate of every anti-evolution gathering for a century to come."

Certainly not every anti-evolution gathering, and maybe not a full century, but the story of Nebraska Man has continued to show up occasionally in anti-evolution literature to this day (e.g., Dewar and Shelton, 1947) and has more recently become a stock item in creationist debates with evolutionists. More than half a century after Forestier's ill-fated attempt at a reconstruction of Hesperopithecus, one of the creationist's chief point-men -- Duane Gish of the Institute for

Creation Research -- is still unable to resist making fun of the drawing and repeating the obvious humor in Osborn's misidentification -- "I believe this is a case in which a scientist made a man out of a pig and the pig made a monkey out of the scientist." (Gish, 1979, p. 130)

Ancestors, Error, and the Stuff of Science

Today, with the evolutionary prehistory of humans firmly documented by African fossil discoveries beginning with Australopithecus in 1924, Hesperopithecus is little more than a peashooter in the creationists' arsenal. George Gaylord Simpson even wondered whether the whole matter needs re-airing -- "So even famous scientists make mistakes, as all humans do. Jove does nod. No one was hurt. No one was even misled for long. So what of it?" (pers. comm., 1983)

But this mistake involved mankind's origins, a topic that is inherently provocative, especially in the context of a creation/evolution conflict. Even after being corrected by scientists themselves, mistakes in descriptions of human ancestors are likely to be immortalized in the diatribes of the creationists. Whereas a few of the creationists' criticisms of the fossil evidence for human evolution are technically correct -- as in the case of Hesperopithecus -- they are often trivial. The reality of human evolution cannot be challenged by reference to one misidentified peccary tooth!

Good science can be practiced only when inappropriate external influences, such as politics, are left out. It is clear now that Osborn's wish to embarrass Bryan may have clouded his scientific judgment and led him to describe a specimen whose affinities required a more restrained assessment.

But Osborn was not alone in his error, particularly in dealing with the Order Primates, the group that includes monkeys, apes, and men. As Simpson (1945, p. 181) aptly put it:

The importance of distinctions within the group [Primates] has . . . been so exaggerated that almost every color phase, aberrant individual, or scrap of fossil bone or tooth has been given a separate name, almost every really distinct species has been called a genus, and a large proportion of the genera have been called families. The peculiar fascination of the primates and their publicity value have almost taken the order out of the hands of sober and conservative mammalogists and have kept, and do keep, its taxonomy in a turmoil. Moreover, even mammalogists who might be entirely conservative in dealing, say, with rats are likely to lose a sense of perspective when they come to the primates, and many studies of this order are covertly or overtly emotional.

Finally, the issue relates to the fundamentally different values that creationism and science place on error. Creationists are quick to point out error by scientists, and ridicule it. They go on to argue that error and disagreement among specialists are indications that the fabric of science is coming apart, and that it will eventually collapse, with creationism reigning triumphant after Armageddon.

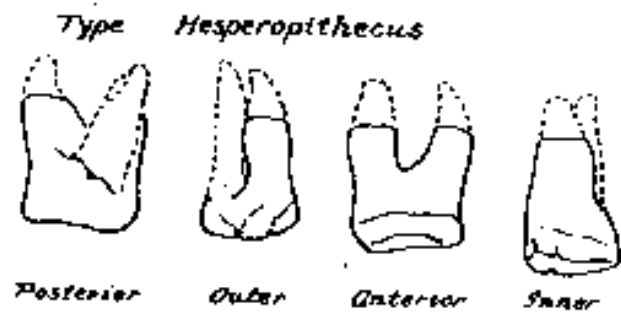
But what creationists ridicule as guesswork, and trial and error, and flip-flopping from theory to theory are the very essence of science, the stuff of science. Error correction is part of the creative element in the advance of science, and when disagreement occurs, it means not that science is in trouble but that errors are being corrected and scientific advances being made. Creationism comes on the scene arguing that the Bible is inerrant as a source of scientific truth and that "creation science" cannot admit of error because it simply does not exist.

We cannot conceive of two more diametrically opposed methods of explaining the world around us. One uses the correction of error as an inherent part of the process of searching for the

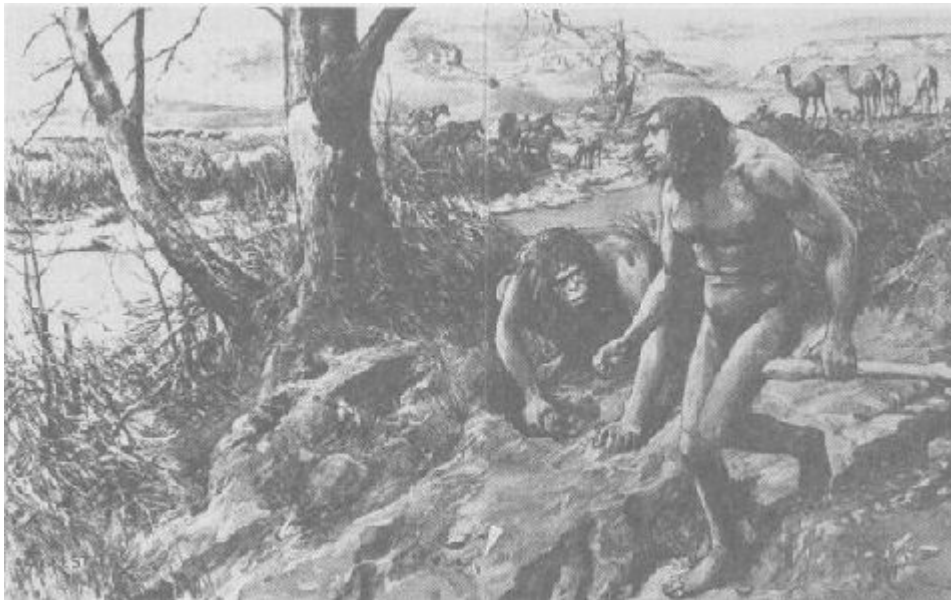
truth, or ultimate reality in nature; the other rejects error or cannot admit its existence. Although it may be human to make mistakes, it is scientific to correct them. That is the nub of the issue between creationism and science.

Acknowledgments

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The Nebraska Man tooth, as shown in the *Illustrated London News*, June 24, 1922



The infamous illustration of Nebraska Man done for the *Illustrated London News* by Amedee Forestier

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