The Display Case

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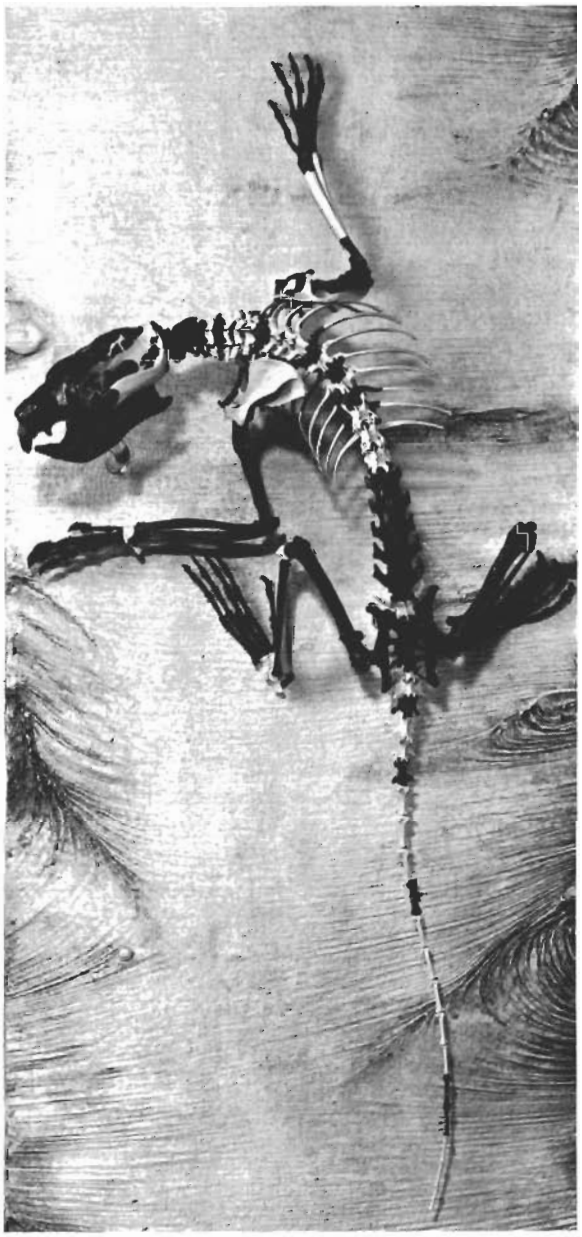
A New Skeleton of *Plesiadapis cookei*

By Philip D. Gingerich and Gregg F. Gunnel

The Paleocene is an epoch of geological time that lasted from about 65 million to about 55 million years ago. While technically in the Cenozoic or "Age of Mammals," many mammals living in the Paleocene belonged to archaic primitive groups. For instance, most people have never heard of Multituberculata, Proteutheria, Proprimates, and Condylarthra, all extinct today. Consequently, the Paleocene is best thought of as a transition interval that followed the Age of Dinosaurs but preceded the real Age of Mammals. The latter started in the Eocene when modern groups like Primates (lemurs, monkeys and apes), Perissodactyla (odd-toed mammals including horses), and Artiodactyla (even-toed animals like deer) appeared and rapidly rose to dominance. Fossils of Paleocene mammals are hard to find, this epoch is still poorly known, and thus new discoveries are always welcome.

In 1986, University of Michigan graduate student Hans Thewissen found parts of a skeleton of the cat-sized primate-like Paleocene mammal *Plesiadapis cookei* while searching for fossils on a Museum of Paleontology expedition in Wyoming. As sometimes happens, the specimen was found as Hans was hiking back to join the rest of our collecting party for lunch. He recognized that the pieces he had found were weathering out of a small freshwater limestone deposit of the type we often find to be full of fossil bones of mammals, birds, lizards, and even frogs and salamanders. On our return to the site, the new *Plesiadapis* specimen was found to be exceptionally complete. Collecting required several trips, and we have been occupied with preparation and casting ever since. Study was slowed when we discovered that the skeleton of *Plesiadapis* was intermixed with bones of a similar-sized carnivorous mammal called *Uintacyon*. The two differ in many respects, but we had to proceed cautiously to avoid confusing bones of one with those of the other. After all the bones had been identified, Dan Erickson, Bill Sanders, and Ellen



Plesiadapis cookei, *is a primitive primate-like mammal that inhabited the area that is now Wyoming, around 60 million years ago. Now on display in the Hall of Evolution, this is the first skeletal reconstruction of this animal.*

(Photo by Dan Erickson.)

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Plesiadapis.....Continued from page one.

Miller were able to complete a freestanding mount of the skeleton in life position. This new *Plesiadapis* skeleton is now on exhibit in the Hall of Evolution (see photograph).

The University of Michigan skeleton of *Plesiadapis cookei* is one of the most complete skeletons of a Paleocene mammal ever found, and this new specimen is one of the most complete primates or primate-like mammals ever found. Limestone is ideal for the preservation of fossils because it forms in low-energy environments, meaning that skeletons are often buried with little disturbance. Limestone is a "chemical" rock, rich in calcium carbonate, which fills, hardens, and preserves bone. Finally, limestone matrix can be removed from bone in a weak acid solution, meaning that skulls and bones can be cleaned with little risk of breakage. Thus we have been able to recover and clean even the most delicate toe bones of *Plesiadapis*.

The skull of the new *Plesiadapis* is slightly crushed, and this has been reconstructed in making the exhibit mount. Most vertebrae were found, including those of the neck, thorax with ribs, lower back, and tail. The limbs differ from those of typical living mammals like cats or squirrels in having relatively long proximal or upper segments (a long humerus bone in the forelimb, and a long femur bone in the hind limb), meaning that *Plesiadapis* was not a running animal. Its hind feet are unusual in being habitually inverted, and joint surfaces indicate that it was probably able to reverse its hind feet as squirrels do when they come down a tree head first. Fingers and toes all end in large but narrowly compressed tips that indicate razor-sharp claws. The combination of long upper limb bones, inverted reversible feet, and sharp claws, taken together, indicate that *Plesiadapis* was a highly arboreal animal. It shows no specializations for leaping however, and may have been a rather slow and deliberate climber. Fossil trees and the presence of abundant coal deposits in Wyoming are evidence that this area was forested during the Paleocene, and *Plesiadapis* probably made its living feeding on flowers, fruits, and leaves in the canopy of the forest.

Plesiadapis has been known since 1877 and, as Paleocene mammals go, it is one of the most common in North America (and in Europe), being represented by thousands of teeth and hundreds of jaws of a dozen different species. The name means "near-*Adapis*," which is interesting because Eocene *Adapis* has been known even longer (since 1812), and it is unquestionably a primate. Almost nothing is known of primates in the Paleocene; but, with a name alluding to *Adapis*, it is not surprising that *Plesiadapis* would be compared to primates. Its molar teeth look like those of primates; the skull looks more like a squirrel; but our new skeleton shows *Plesiadapis* to be very distinctive. We are happy to have such a complete specimen, but sorry its discovery has clouded what tenuous evidence we previously had of a Paleocene chapter in primate evolution.

Now Available – Traveling Discovery Kit

By Kelly Sullivan

The Exhibit Museum is pleased to announce that our first Traveling Discovery Kit is now finished and ready to begin visiting area schools. The topic of the kit is *Endangered Species*, and it contains, in addition to books and videos, products (which had been seized by U. S. Customs) made from endangered or threatened species. Anyone interested in renting the exhibit for school classroom use should contact The Exhibit Museum at (313) 764-0478. The project was made possible by a grant from the Ann Arbor Area Community Foundation. Future exhibits dealing with other natural history topics are planned. This first kit was initiated by former Museum Intern Ann Hummel and completed by current Intern Kelly Sullivan.

Museum Intern Kelly Sullivan with the prototype Traveling Discovery Kit. (photo by S. H. Hinshaw.)

Coming Soon – An Original Dinosaur Poster

By Kelly Sullivan

Coming soon to the Exhibit Museum Gift Shop is a poster depicting the meat-eating dinosaur, *Allosaurus fragilis*, and it's environment, as they may have appeared during the late Jurassic period over 140 million years ago in what is now Utah. The poster, the first of its kind, is the work of John Klausmeyer, Museum Exhibit Preparator.

Special Note:

Kelly Sullivan, the Museum Intern this past year, has agreed to continue as our Intern for one more year before returning to school to begin her graduate education.

Congratulations Kelly!