That exhibit continues to undergo changes through the years. Artificial trees and ropes are provided for climbing.

When animals live in the wild, they have lots of opportunity to make choices. In a traditional zoo atmosphere, all the choices are made for them—what they eat, when they eat, where they sleep, and so on. The Sacramento orangutans have an indoor area available to them when the weather is too hot or too rainy to be outside. They can make the decision as to where they want to be.

Enrichment programs provide the animals with novel experiences that stimulate and encourage the types of behaviors that would be typical of these animals in the wild. In the wild, almost half an orangutan's time is spent in foraging for food. Besides occupying time, this provides intellectual stimulation for the animal. Food in captivity is often provided in such a way as to encourage natural foraging behavior. In modern zoos, food is sometimes concealed in different places around the exhibit so the animal can look for it. Sometimes food is placed inside a puzzle that the animal has to manipulate in order to obtain the food. Using the puzzle feeder results in increased feeding-related behavior and more activity.

Besides being good for the animal, enrichment tends to make a visit to the zoo more enjoyable for the visitors. It's a lot more interesting to watch an orangutan swing on ropes, climb through trees, and manipulate a puzzle feeder than to watch it pace back and forth on a well-worn path. No program can duplicate the natural environment, but an enrichment program can provide opportunities and motivation for the orangutans to practice appropriate behavior, reduce stress, and generally improve the animals' physical, mental, and social well-being.

– Pat McCarthy

ORCE

Orce is a Spanish village famous for the controversy regarding the supposed finding of the oldest Eurasian hominid: the Orce man. Orce is near the Venta Micena paleontological site in the Guadix-Baza basin, Granada province, Spain. In 1982, a small cranial fragment was found in the Venta Micena excavation quarry and was published in 1983 as *Homo sp.* by Josep Gibert, Jordi Agustí, and Salvador Moyà Solà. They claimed that this fossil, unearthed from sediments 1.8 million years old, constituted the oldest hominid found in Eurasia and belonged to *Homo erectus* or even *Homo habilis.* Once the fossil was cleaned, in the inner face a prominent crest appeared, and the controversy began. The prestigious French paleoanthropologists, Henry and Marie Antoinette de Lumley, retracted their support of the hominid attribution. Agustí and Moyà Solà published a paper in 1987 concluding that the suture and the crest made impossible the attribution to *Homo* and the fossil was reattributed to *Equus.* Nevertheless, Gibert decided to maintain his attribution to *Homo* and began a controversial search for evidence and support.

The fragmentary fossil, popularly named the "biscuit," given its small size and rounded form, was exhaustively analyzed. Domènec Campillo concluded, based on the contradictory morphology, that it belonged to an infant of the genera *Homo.* Enrique García Olivares also concluded, based on immunological analyses, that the fossil belonged to a hominid, but it was suspicious that a fossil so old contained such high quantities of human albumin. Paul Palmqvist studied the cranial suture using fractal analysis and also concluded that the fossil could have belonged to the genus *Homo.* However, Palmqvist soon realized that the oversimplified suture sent by Gibert was not real, accused him of fraud, and published another paper in the *Journal of Human Evolution,* reevaluating the evidence and concluding that the fossil may have belonged to a 3- to 5-month-old horse. The details regarding this controversy were reported in 1998 by Eustoquio Molina in the journal *El Escéptico,* concluding that this could be a case of pathological science.

The controversy was magnified by the mass media, where Gibert looked for support, making many sensational claims. Three outstanding Spanish paleontologists replied in a newspaper article, criticizing the Gibert methodology. As was stated long ago by David Hume, extraordinary claims demand extraordinary evidence (Occam's razor), however the evidence found by Gibert and his colleagues is not extraordinary but very suspicious and controversial. Consequently, the

most plausible attribution of the fragmentary fossil is to *Equus,* which is very abundant in the site, although based on a recent reinterpretation of the anatomical evidence by Bienvenido Martínez Navarro, it could be attributed to a ruminant, which is also frequent in the site. Nevertheless, Gibert still maintains the hominid attribution in his controversial book, *El Hombre de Orce: Los Homínidos que Llegaron del Sur* (2004). At present, few scientists believe Gibert's sensational claims, but he still has the support of his friend Campillo, who published another controversial book, *El Cráneo Infantil de Orce: El Homínido Más Antiguo de Eurasia* (2002).

The oldest fossil hominid remains in Eurasia cannot be the controversial fossil fragment from the Venta Micena site, which is not considered human. At present, the oldest human remains in Spain are those of *Homo antecessor* from the Trinchera Dolina site (Atapuerca) dated at 0.78 million years. Furthermore, the oldest hominid evidence is the lithic industry that has been recently found at the Sima del Elefante site (Atapuerca) and Barranco León-5 and Fuente Nueva-3 sites (Orce). This evidence is dated at about 1 to 1.3 million years, having been found just below Jaramillo in the Matuyama magnetochron.

— *Eustoquio Molina*

See also **Arsuaga, J. L.; Atapuerca; Bermúdez De Castro, J. M.; Creationism vs Geology; Homo Antecessor; Homo Erectus; Homo Habilis; Paleoanthropology**

Further Readings

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Oreopithecus

One of the most controversial fossil primates known, *Oreopithecus bambolii* has generated substantial debate since its original discovery in the 1870s. Although only distantly related to humans, this Miocene hominoid shows several features that later evolved in parallel in the earliest human ancestors, including potential bipedalism and hand grasping ability. While its taxonomic placement and phylogenetic affinities have garnered controversy, scientists recognize *Oreopithecus bambolii* as an important species in understanding the evolution of certain human characteristics.

The first *Oreopithecus* specimens were discovered in the early 1870s in the lignite mines of Tuscany. In 1872, noted French anatomist and paleontologist Paul Gervais named these fossils *Oreopithecus,* which he described as similar to both gorillas and macaques. Much debate over the phylogenetic position of *Oreopithecus* soon followed, with some scientists arguing that the species was perhaps ancestral to modern humans and others pushing for a close linkage to the Cercopithecidae. A cache of additional specimens, including a complete skeleton of a young adult male, was unearthed near Baccinello, Italy, in 1958. Originally studied by Johannes Hürzeler, these specimens have settled much of the taxonomic debate. Although *Oreopithecus* "jumps around" in many modern cladograms, most researchers agree that this genus is a primitive hominoid closely related to *Dryopithecus.* Depending on which classification one follows, *Oreopithecus* may be placed in the Hominidae, but is far removed from humans.

Although known only from Italy and possibly Moldova, *Oreopithecus* is the best represented European fossil hominoid. Its fossils have been found in the Late Miocene sediments of Tuscany and Sardinia, which have been dated to 7–9 million years ago. During the Late Miocene, this region is thought to have been an island, and the insular environment of *Oreopithecus* is often cited as the source of many of its unusual features.

Oreopithecus was a relatively large-bodied primate, reaching sizes of 30–35 kilograms. Chief among its distinguishing features were a small brain, extremely short face, small postcanine and canine teeth, gracile carpals, and robust facial bones that indicate strong chewing muscles. The primitive and conservative