



**Media only:** Kelly Carnes (202) 633-2950  
Annalisa Meyer (202) 828-5069

March 17, 2010

**Media Web site:** <http://newsdesk.si.edu>

## **Did You Know? – Human Origins Facts**

### **Introduction**

The study of human origins is one of the most compelling areas of scientific discovery today. It is a vibrant field that encompasses the search for fossils, discovery of the major milestones in the origin of our species and advances in DNA research.

The exhibition presents the grand sweep of human origins based on discoveries and evidence at the core of the scientific research.

The title of the exhibition, “What Does It Mean to Be Human?,” is one of the most profound questions humans have asked for millennia—a question that is informed by philosophy, religion and the arts and sciences. The exhibition’s goal is to provide a solid foundation for the public to explore the scientific contributions to answering this question.

The exhibition considers human beings in the greatest time depth and in a more encompassing manner than any other Smithsonian installation. It offers access to many of the discoveries and evidence of human origins, documenting the emergence of the qualities that have defined all human beings and societies in response to a changing world.

Nearly all of the fossils, archeological remains and genetic findings that a natural history museum can offer on such questions as: how did we get here, how are humans similar to, yet distinct from, other living beings, and what does it mean to be human, have been found over the past 100 years, since the Natural History Museum opened in 1910. The Hall of Human Origins showcases the science that will help visitors answer these and other questions. And in the course of their journey through time, the exhibition also presents visitors with the evidence behind the following facts about our human origins:

## Our Species: *Homo sapiens*

- The characteristics that define our species today evolved over 6 million years as our early human ancestors adapted to a changing world.
- About 200,000 years ago, a new species of human evolved in East Africa. It was *our* species, *Homo sapiens*. By studying the DNA of humans living throughout the world today, scientists know that these hunter-gatherers were the ancestors of *every* human being alive today.
- We live in an unusual time in the overall journey of human origins—we are the only remaining species of a diverse family tree of earlier human species. *H. sapiens*, or modern humans, co-habited the Earth with other early human species, at times living in the same geographic area. In fact, just 70,000 years ago, there were at least four human species on earth (*H. erectus*, *H. floresiensis*, *H. neanderthalensis*, *H. sapiens*).
- While our species, *H. sapiens*, has survived for about 200,000 years, some species of earlier humans thrived for several times longer before their extinction.
- Fossils of more than 6,000 individuals have been discovered so far, representing more than a dozen species of early humans. Only our species, *Homo sapiens*, remains.
- Modern humans are great apes, one of the major groups on the primate family tree. We are very closely related to chimpanzees in that we have shared ancestry, but are *not* descended from any living species of monkey or ape.
- The last common ancestor of humans and living apes lived between 8 and 6 million years ago. We have not yet discovered its remains. The earliest human species, which evolved in Africa, are our closest link to other primates.

## Our Dispersal Around the World

- For the first several million years of human evolution, early humans lived only in Africa. By about 1.8 million years ago, they began to spread into other parts of the world.
- Beginning around 60,000 years ago, as many human populations moved farther away from the equator, they evolved variations in skin tone, hair texture and facial features. These variations arose fairly recently, over just the past few tens of thousands of years.

## Our Bodies

- As early humans spread to different environments, they evolved body shapes that helped them survive in warm and cool climates. In warm climates, they evolved narrow bodies that helped them stay cool. Long legs enabled them to travel longer distances. Changing diets also led to changes in body shape.
- Although outward appearances vary widely, all modern humans have strikingly similar skulls—defining features that differ from those in early human skulls. These features include the shape and size of the braincase, face and teeth. For example:
  - Neanderthal
    - ❖ Large brow ridge
    - ❖ Low forehead
    - ❖ Middle part of face juts out

- Modern human
  - ❖ Small brow ridge
  - ❖ High forehead
  - ❖ Middle part of face is beneath forehead
- The bodies of early humans were adapted to very active lifestyles. Their bones were thicker and stronger than ours. Starting about 50,000 years ago, as a result of less physically demanding lifestyles, human bones became sleeker and weaker.
- Back pain and other skeletal problems are relatively common in modern humans, an unfortunate side effect of walking upright. Distributing all our weight on just two limbs can have painful consequences—such as lower-back pain, slipped disks, arthritis in hips, arthritis in knees and collapsed foot arches.

### **Our Diet and Cooking**

- The oldest known human ancestors ate mainly plants, which take longer to digest than meat. Long digestive tracts helped process this food. By about 1.8 million years ago, human ancestors ate a diet richer in meat, and by about 790,000 years ago, cooking food was possible. As a result, modern humans possess a shorter digestive tract that can process foods more easily.
- Control over fire provided a new tool with several uses including cooking, which led to a fundamental change in the early human diet. Cooking released nutrients, rid some plants of poisons and made plant and animal foods easier to digest. The earliest hearths are at least 790,000 years old. Some researchers believe cooking may have begun more than 1.5 million years.
- Eating meat and other foods that could be digested quickly not only led to a smaller digestive tract but also made more energy available for tall bodies and large brains.

### **Our Brain**

- Over the course of human evolution, brain size tripled. The modern human brain is the largest and most complex of any primate. Besides its large size, the human brain has a larger number of connections among the nerve cells, which enable faster mental processing.
- Human brain size evolved most rapidly during a time of dramatic climate change. As early humans faced new environmental challenges and evolved bigger bodies, they evolved larger and more complex brains. Large, complex brains can process and store a lot of information, which was a big advantage to early humans in their social interactions and encounters with unfamiliar habitats.
- An expansion in brain size over time was not inevitable. Although the species *H. floresiensis*, nicknamed “hobbit,” lived until recently—about 17,000 years ago—it had one of the smallest brain sizes of any early human species. Its body and brain were very small, probably due to the scarce resources available on the one island where it lived, Flores, Indonesia.

### **Our Social Life and Networks**

- Our large brains come at a cost—the difficulties of birth. This means that every person is born at a relatively immature phase, with rapid brain growth continuing for a prolonged period following birth. Care by adults is critical for years, a development that has shaped the social organization of all human societies.

- Humans are unusual in that when we find food, we usually carry it somewhere else rather than eat it right away. This distinctive trait developed more than 2 million years ago.
- Social life also involves building shelters and hearths—key ingredients in the social gathering of early human ancestors as far back as 400,000 to 800,000 years ago.
- 130,000 years ago, groups that lived 300 kilometers (186 miles) apart were exchanging resources, and since that time, social networks have continued to expand and become more complex.

### **Evolving from Youth to Adulthood**

- As teeth develop, new enamel layers form daily. Scientists used CT scanning to count the enamel layers on teeth of a *H. sapiens* child who lived in northern Africa 160,000 years ago. The layers revealed that the child's teeth were growing and erupting at the same rate as those of 7- to 8-year-old children today, telling us that this fossil human child was growing at the same rate as living humans.
- Humans are the only mammals that have a childhood phase and stay dependent on adult feeding and care for a prolonged time after weaning. Humans are also the only mammals with an adolescent period— a time of accelerated growth with a delay in social adulthood even after sexual characteristics develop. These stages enable us to learn, play, socialize and absorb important experiences before adulthood.

### **Our Tools**

- Like other great apes, humans have highly dexterous, grasping hands that enable us to hold and manipulate tools. No other primate depends as completely on tools and technology as humans today. We are unique in using tools to create other tools.
- Tools enabled early humans to obtain new foods, alter their surroundings and survive in many environments. The earliest stone tools are at least 2.6 million years old. They include simple stone flakes, cores and hammerstones. Early humans used this basic toolkit to cut, pound, crush and access new foods—including meat from large animals.
- Early humans butchered large animals as long as 2.6 million years ago, but they may have scavenged the kills from lions and other predators.
- For nearly a million years, the human toolkit remained largely unchanged. By 1.6 million years ago, early humans were shaping more refined tools, such as hand axes. Beginning about 300,000 years ago, early humans began to invent more diverse tools to obtain a wider range of foods. After modern humans evolved, innovations in technology arose at an ever-increasing pace.
- The oldest specialized fishing implements were developed by about 70,000 years ago. Humans in Central Africa used barbed points made of bone to spear huge catfish weighing as much as 68 kilograms (150 pounds), enough to feed 80 people for two days. Later, humans used harpoons to hunt large, fast marine mammals.

### **Our Language and Symbols**

- Humans are the only mammal that cannot breathe and swallow at the same time, and we are the only species that can choke on its own food. The reason? The lowering of the voice box in our throats (during infancy) enables us to create the enormous range of sounds used in producing language; but this lowering of the voice box comes at a big cost in adulthood.

- The oldest “crayons” (around 250,000 years old) are from Twin Rivers, Zambia. They consist of a stick and a block of pigments with facets—where red and yellow pigments were rubbed repeatedly, like crayons. This represents the first known use of color.
- 35,000 years ago humans were creating two- and three-dimensional images of the world around them.
- 17,000 years ago humans had developed all the major representational techniques, including painting, drawing, engraving, sculpture, ceramics and stenciling. Working on stone, ivory, antler and occasionally clay, they created imaginative and highly complex works of art.
- Around 8,000 years ago humans were using symbols to represent words and concepts. True forms of writing developed over the next few thousand years.

## **Our Impact on the World**

### **Animal Domestication**

- From 1961 to 2004, the population of cattle, pigs, sheep and goats increased from 2.7 to 4.1 billion. The number of domesticated fowl grew from 3 to 16 billion.
- Of the estimated 15,000 species of mammals and birds, only about 30 to 40 have been used for food.
- Fewer than 14 species of animals account for 90 percent of global livestock production today.

### **Agriculture**

- About a quarter of Earth’s surface is used to grow crops.
- Fewer than 20 plant species produce most of the world’s food.
- Most of the world’s population is dependent on four crops: wheat, corn, rice and potatoes.

### **Growing Numbers of People**

- Between 1959 and 1999—just 40 years—the human population doubled from 3 billion to 6 billion people.
- Today the world’s population continues to grow by more than 90 million people per year.
- By 2042, the world population may reach 9 billion, an increase of 50 percent in 43 years.

### **Unintended Consequences**

- A cholera pandemic that began in 1961 is ongoing and growing in Asia, Africa and the Americas. The number of cases reported in 2006 was 79 percent higher than in 2005.
- Every year between 3 and 5 million people get the flu, and 250,000 to 500,000 people die from it.
- About 40 percent of the world’s population is at risk of malaria; a child dies from the disease every 30 seconds.
- One-third of the world’s population is infected with tuberculosis, with one person contracting the disease every second.

## **About the Smithsonian's National Museum of Natural History**

The Smithsonian's National Museum of Natural History, located at 10th Street and Constitution Avenue N.W. in Washington, D.C., welcomed more than 7.4 million visitors in 2009, making it the most visited museum in the United States. The museum is open daily from 10 a.m. to 5:30 p.m. Admission is free. More information about the museum is available at [www.mnh.si.edu](http://www.mnh.si.edu) or by calling (202) 633-1000, TTY (202) 633-5285. In addition to the Web site, learn more about public programs and get the latest updates and access to insider videos and images via [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).

###