

Our Furry Friends: the History of Animal Domestication

by JESSICA LEAR under mentor MARGARET HARRIS

Most of us go about our day without considering our encounters with domesticated animals: our pet dog, the horse we rode on the beach, the cow we just had for lunch. Yet animal domestication has played a significant role in our lives. “The history of domestication is interesting because it changed human history. The domestication of animals was important enough to have happened in many places and for different species rather than just once,” said Kim Worley, Associate Professor in the department of molecular and human genetics at the Baylor College of Medicine. Questions of why, how, and especially when animals became domesticated have intrigued scientists for years.

Although new technology involving mitochondrial DNA has allowed researchers to estimate when animals were first domesticated, there remains some doubt about the precise dating of a timeline. Scientists believe the dog was the first animal to be domesticated, though some believe it may even have been earlier. Since then, numerous animals including horses, pigs, and even honeybees have been domesticated for human purposes—like farming and companionship, among others.

Pet Domestications

The idea that a dog is man’s best friend seems to be a very old concept. In fact, a dog jawbone found in Iraq led scientists to believe that dogs were domesticated over 14,000 years ago. Although wolves are the closest relatives of dogs, scientists are able to distinguish the skeletal elements because wolf heads grow larger through adulthood, whereas that of a dog retains juvenile traits.

Though dogs have been domesticated for a long time, they have undergone many changes since those earliest years, as humans have used selective breeding to create new dog breeds with desired qualities. The Romans preferred colors for their dogs: shepherd’s dogs were bred

white so they did not look like wolves at night and farmyard dogs were to be black to scare away thieves. Their shapes have also changed, although smaller-bodied dogs are not a modern invention. There is evidence that a dog similar to the Pekingese, a small, vulnerable dog, lived in China in the 1st century A.D.

Cats are descended from five different types of wildcat, and are thought to have been first domesticated around 7,500 B.C. While they have been used as companions and pets, they have historically also been used for controlling mice and rat infestations. In fact, it is believed that cats may have first encountered humans after they were attracted to rat-infested areas where humans lived.

Though the first evidence of a domesticated cat was found in Cyprus, they are most famous for their role in ancient Egyptian society. Egyptians often mummified cats and placed them in luxurious chambers in the pyramids. There were even three feline goddesses that Egyptians worshipped.

Farm Domestications

Alan K. Outram, head of archaeology at the University of Exeter, says that for most species, studying domestication is not about pets, but about finding the origins of a farming economy that produced food rather than collecting it from the wild. The first animals to be domesticated for food use are thought to be sheep, between 11,000 and 9,000 B.C. in Southwest Asia. Goats followed later around 8,000 BC. Both animals were used for their meat, milk, and coats, and became an integral part of nomadic communities.

Ross Tellam, a researcher at CSIRO Livestock Industries in Brisbane, Australia, said that scientists can tell when milk-bearing animals were domesticated based on when the humans in the area became lactose tolerant. “The mutation



Man’s second best friend. Domesticated cats were often represented in Egyptian art and sculpture.

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that enabled the utilization of lactose as an adult gave an enormous advantage to that population and contributed to stable human populations that had the luxury of excess calories,” Tellam said. “This helped civilizations to emerge.”

Pigs and cattle were domesticated around the same time as sheep and goats, but tended to be domesticated by more settled communities. “Farming vastly increased humans’ capacity to feed larger populations, and also led to a much more settled way of life. With the arrival of large permanent settlements, and with the ownership of land and agricultural surplus come major changes in the way societies were organized,” Outram explained.

Animals that belonged to farming communities were herded instead of immediately eaten because the farmer's ability to tame them meant a continuous supply of meat and dairy.

"The history of human civilizations and cattle domestication are intimately intertwined," Tellam said. "The ability of humans to maintain a reliable, high energy food source that was mobile and able to live on poor quality land was a huge advantage and this factor certainly fostered stable communities and new knowledge."

Kim Worley believes that understanding cattle domestication is crucial to the well-being of humans. "For cattle, there is great interest in using traits important to meat and milk production, disease resistance, heat tolerance, etc.," she said. All of these features of cattle are of interest to humans because of how often we eat their meat or drink their milk. It is thus highly important that these products be the healthiest they possibly can be.

It has been hard to pinpoint a place and time that horses were domesticated, since they were widespread and did not

take on distinct morphological changes when domesticated, as observed in other animals. "Many domestic animals see a significant size drop upon initial domestication, and some animals show significant morphological change, too. Horse size does not seem to have been affected in the same way as other animals and there are no immediately visible morphological changes," Outram said.

There have been reports of horse domestication as early as 5,000 B.C. in Kazakhstan and 4,000 B.C. in the Eurasian Steppes, a stretch of land between Hungary and Mongolia. Archaeological evidence suggests that horses were used initially for food and milk—not riding—since the teeth of these very early domesticated horses do not show evidence of being worn down by a bit (the part of the harness that fits in a horse's mouth). The first conclusive evidence of horse riding, in the form of bit-worn teeth, was found in Kazakhstan and dates back to 3,500-3,000 B.C.

"The riding of horses was a very significant additional development. This led to a revolution in transport, trade, migration, and forms of warfare," Outram said. "Horseback riding may have been a key component in the fast spread of culturally important ideas and technologies."

Horses have provided a means of transportation for thousands of years, even beyond horseback riding, as exemplified in the horse-drawn chariots of Mesopotamia in 2,000 B.C. Up until modern times, horses have played a key role in warfare and have provided transportation to the masses.

Unique Domestications

Elephants, unlike other domesticated animals, have never been truly tamed, though it is thought that they were serving humans in India as early as 2,000 B.C. They can be taught many behaviors and may act under the command of humans, but are still known to have outbreaks of temper. Male elephants are harder to control, so females are often used

for domestication purposes; the exception is elephants trained for war. Besides warfare where they were used for intimidation, elephants have been used to provide transportation for people and goods as well as for entertainment, as in circuses and zoos. Throughout the past few decades, the care of elephants in circuses and zoos has greatly improved, allowing these majestic animals to continue to be semi-domesticated and seen by millions.

Many would not consider honeybees to be a domesticated animal, and while they can be aggressive, humans have found a way to control them. Beekeepers collect honey and beeswax using artificial hives and smokers that protect them from the insects. Honey was a sought-after product in ancient Greece and the Roman Empire, and ancient bee keepers have even been depicted in multiple wall paintings in Egyptian pyramids. However, honeybee domestication could date back further still, to 4,000 B.C., since researchers believe honey bee domestication began with indigenous tribes all over the world that would harvest honey from nests for food.

The Downside to Domestication

Although domesticated animals have brought humans invaluable advantages throughout history, they have not come without a price. One of the main disadvantages of animal domestication has been an increase in the number of diseases from contact with animals. Animal domestication has allowed the human population to increase and create densely populated areas, but at the same time has allowed for the transmission of pathogens from the animals—pathogens which otherwise may have remained isolated. Farm animals have especially put people at risk: cows with tuberculosis, pigs with influenza, and horses with rhinoviruses. Humans can also contract diseases from their pets and even share a few parasites with their furry companions. Even though domesticated animals may cause disease, they played a necessary role in mankind's history and existence and will continue to play a key part in our civilization.



Manners are no small matter. Even the very largest land mammals, elephants, were domesticated and used for a variety of purposes.

Image: "Seleucis war elephant" available under Creative Commons license at http://commons.wikimedia.org/wiki/File:Seleucis_war_elephant.jpg.

So why hasn't man domesticated every animal? After all, a horse and zebra are pretty similar, but you will not see many people trying to ride a zebra. Evolutionary biologist Jared Diamond identified six criteria that an animal must meet in order to domesticate it:

1. Flexible diet
2. Reasonably fast growth rate
3. Ability to breed in captivity
4. Pleasant disposition
5. Temperament that makes it unlikely to panic
6. Modifiable social hierarchy

With these characteristics in mind, it makes sense that a relatively good-natured pig is domesticated while a violent warthog is not. It makes sense why we can't use a zebra for milk or a squirrel as a circus animal. ■

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