

# Paws for Pets

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## Cicada Facts:

- Periodical cicadas get their names because they come out of the ground periodically, some on a two-year schedule and others after longer periods of time.
- Scientists think the cicadas seem to all come out at the same time because they wait for the soil and air to warm to 64°F (18°C) as summer comes.
- These bugs are big: Most measure 1 to 2 inches (25 to 50 millimeters).
- About one and a half hours pass from the time the cicada's hard shell cracks open to when its wings emerge.
- No one knows why the cicada's life cycle is 17 years, but some people suggest that because many cicadas emerge only after a long while instead of only a few each year, predators can't gobble them all up and kill off the species.

## How Did Dogs Become Adept at Playing to Humans?

Brian Handwerk  
for *Ultimate Explorer*  
February 6, 2004

Dog lovers know that man's best friend has an uncanny ability to understand and react to human actions. Clues to how dogs came to develop this ability lie somewhere in their evolutionary past, and learning the answer could shine light on our own development as humans.

Harvard Anthropologist Brian Hare's journey into canine cognition began with a study of human development. "I was interested in how humans develop cognitive skills," he told *National Geographic News*. "What is it that allows us read social cues and understand communicative gestures?"

Seemingly simple cognitive tasks like following the gaze of another human or responding to pointing and other gestures are easily taken for granted. But Hare explains that such skills precipitate a domino effect that enables humans to learn many things about the world.

To determine if other animals shared such important abilities, Hare tested a close human relative—the chimpanzee. He alternately placed food in one of two identical cups, but unlike the infamous 'shell game,' he attempted to help the animals locate the food by tapping, pointing to, or simply gazing at the correct cup. The result? "The great apes are really good at lots of other things, but in this type of cooperation and communication exercise they really struggled," he said.

But almost by accident another test subject appeared. "I said hey, I bet my dog can do this," Hare recalled. "It's the same reaction many people would have. It was not a surprise to anybody but scientists."

Domestic dogs (*Canis familiaris*) performed exceptionally well at the same tests that stymied the chimps. But the question was why, and why did most other animals struggle?

### Special Abilities May Have Genetic Roots

The most obvious answer is that dogs live and interact with humans and are simply conditioned through human exposure. But subsequent tests cast doubt on the theory.

"We tested puppies," Hare said. "We tested litter-reared pups who had very, very little exposure to humans and compared the results to age-matched pups that had lived in families since birth and were taking obedience classes. There was no difference."



Photograph courtesy  
*National Geographic*  
*Ultimate Explorer*

## Cat Cloning Offered to Pet Owners

Maryann Mott  
for National Geographic News

Now cats may have more than nine lives. The company that funded the first successful cloning of a domestic cat two years ago has gone commercial.

An e-mail sent in early February to the company's gene-banking clients offered to clone up to six cats. The cost? U.S. \$50,000 each. Clients had less than a month to take advantage of the offer, which ended Friday, February 27.

A cloned cat is a unique, newborn animal that shares genes and possibly behavioral tendencies with its genetic predecessor.

Ben Carlson, vice president of communications for Genetic Savings and Clone, said four clients signed up to duplicate their cats, and work to reproduce the pets will begin immediately. The privately held company based in Sausalito, California, plans to present the clones to owners in November.

Three cats owned by the company will also be copied. The cats and their genetic donors will be displayed at the American Veterinary Medical Association conference, Carlson said, to give veterinarians an opportunity to see them and learn about the technology.

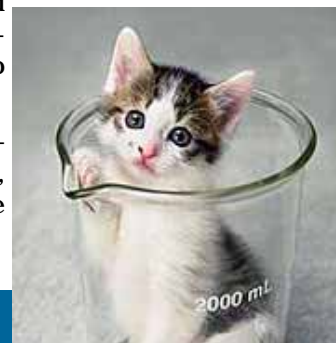
The company is also working on duplicating dogs—specifically, a husky mix named Missy, whose owner, Arizona entrepreneur John Sperling, has pumped millions of dollars into the cloning project since it began in 1997. Missy died at age 15 in 2002, but tissue samples of her have been saved for cloning purposes.

### Health Risks

According to a 2002 survey published in the science journal *Nature Biotechnology*, 23 percent of all cloned mammals produced by nuclear transfer—transplanting the nucleus of one cell into another—failed to reach healthy adulthood.

The survey showed that health problems in cloned animals range from mild to fatal, including obesity, anemia, heart defects, liver fibrosis, and respiratory failure.

The first cloned mammal—Dolly, a sheep—was euthanized last year because of a virus-induced lung tumor. The Roslin Institute in Scotland, which produced Dolly, said there is no evidence that cloning was a factor in the six-year-old sheep contracting the disease. (Continued on page 3)



Genetic Savings and Clone has successfully cloned cats, including CC (above), the first cloned cat. The company had four clients sign up to have their domestic cats cloned for U.S. \$50,000 each.

Photograph copyright Richard Olsenius, courtesy Genetic Savings and Clone, Inc.



### Photo in the News: Mouse Rides Frog in India Monsoon

**July 5, 2006**—It could be the most spirited interspecies escape since *The Rescuers*. But unlike the 1977 Disney movie, this situation is anything but fun.

Photographed Friday in the northern Indian city of Lucknow, a mouse perches on a frog in waist-deep (for a frog, anyway) floodwaters—a small sign of the early arrival of annual summer monsoon rains.

## Cat Cloning continued..

Since Dolly's creation in 1996 a variety of other animals have been duplicated, including a caracal cat and an African wildcat.

Animals and their clones, though, don't always look identical... people may be unhappy with a cloned pet when they realize it's not an exact replica of the animal they've lost or will soon lose.

The two wildcats were duplicated last year by scientists at the Audubon Center for Research of Endangered Species in New Orleans, Louisiana. According to a spokeswoman, both cats are doing well and will be on display this spring at the Audubon zoo.

Carlson reports that Genetic Savings and Clone's first cloned cat, named CC, is now two years old and healthy.

To calm fears of possible cloning-related health problems, Genetic Savings and Clone guarantees their cloned cats will be "completely healthy and strongly resemble the genetic donor." If not, owners will get a full refund.

### Exact Replica?

Animals and their clones, though, don't always look identical. Take CC, for example. She has a different coat than her genetic donor, Rainbow, a calico domestic shorthair. The company says calico cats are an "unusual case" and "will always look different from their donors."

Curt Youngs, an associate professor in the Animal Science Department of Iowa State University in Ames, says people may be unhappy with a cloned pet when they realize it's not an exact replica of the animal they've lost or will soon lose.

Genetics and environment play a role in how an animal ultimately looks and acts. There is strong underlying genetic control over an animal's coat coloring or pattern, he said. But an animal's coat can be influenced by changes that occur while the animal is in the womb—for example, if the surrogate mother gets sick or if there's a sudden change in nutrition.

Plus, Youngs said, the conditions in which the original pet was raised cannot be duplicated.

"I think people are going to be disappointed that Fluffy neither looks the same nor acts the same," Youngs said. He teaches a class to veterinary students that covers the science and bioethics of nuclear transfer.

## Photo in the News: Dog Saved From Shark-Bait Fate

**October 19, 2005**—A veterinarian on the island of Réunion, just off the coast of Africa, prepares to remove a fishing hook from a pet dog's snout this past summer. The dog had escaped fishers who planned to use it as shark bait, according to the animal rights group that shot the video from which the image is taken.

Though apparently restricted to a few amateur fishers, the practice is now seen as a problem on the French-controlled island, which teems with stray dogs and cats. Local authorities this month fined a man for hooking a puppy, and the French government has issued a statement condemning the illegal practice.



## Dogs...continued from front page

Another possible explanation is that canids naturally have such abilities, which developed from pack hunting or their own social structure. That theory was put to the test by the dog's closest relative—the wolf (*Canis lupus*). Many scientists believe that all dogs originated from a population of wolves that lived in China between 40,000 and 15,000 years ago.

Ádám Miklósi led a group of researchers at Eötvös University in Budapest, Hungary who conducted the "shell game" tests on wolves. The test wolves were raised by humans and socialized to a comparable level as their dog counterparts. But although they could follow some signals, the wolves could not perform to the level of dogs.

Miklósi's test also included an important second step. He presented the animals with an unsolvable problem—a bowl of food that was impossible to access. The team found that while wolves continued to work at the unsolvable problem for long periods, dogs quickly looked at the humans for help.

"Based on these observations, we suggest that the key difference between dog and wolf behavior is the dogs' ability to look at the human's face," Miklósi summarized in *Current Biology*. "Since looking behavior has an important function in initializing and maintaining communicative interaction in human communication systems, we suppose that by positive feedback processes (both evolutionary and ontogenetically) the readiness of dogs to look at the human face has led to complex forms of dog-human communication that cannot be achieved in wolves even after extended socialization."

If these two relatives can't relate equally to people, how did a dog/wolf split allow dogs to develop superior people skills? That question led Hare to Siberia, where scientists are continuing a running evolutionary experiment that's decades old.

### Fox Study Poses Tantalizing Questions

In 1959, the late Dimitri Balyaev and his colleagues began domesticating foxes. Since that time a population of foxes has been selectively bred on one factor alone—their behaviour towards humans. Foxes who approached humans at a seven-month-old trial meeting were allowed to breed, while others who appeared afraid or aggressive were disqualified. After 20 generations the population began showing many signs of domestication, such as approaching humans and even wagging their tails and barking at the approach of a human. The animals are currently domesticated enough to serve as house pets.

But the selection has affected more than behaviour. The foxes, like many domestic animals, began to exhibit curly tails, floppy ears, and smaller tooth and bone size—though none of these were selection criteria.

Could cognition be a breeding by-product like these physical changes? Hare hopes to explore the question by testing the foxes.

"The critical thing is that they did not select for cognition, only for niceness," he explained. "I have no idea how dogs became dogs; There are stories but not hard facts. But I know exactly how these foxes became they way that they are. So those kind of test results could help us figure out—is it that you must have selection for intelligence to be smart, or could it result from selection on other factors like behavior towards humans?"

"Just as you have accidental byproducts like curly tails and floppy ears, could you become smarter as an accidental byproduct of selection on niceness?"

While he looks forward to continuing his research with dogs and foxes, Hare also enjoys pondering the question's potential implications for humans.

"Many anthropologists think that as humans evolved we became smart because it's good to be smart," he said. "But maybe it was selection on what scientists and breeders call temperament. "Maybe nice people eventually became smarter, rather than smart people becoming nice."

