

## How Did Humans and Dogs Become Friends?

Connections in the Americas began 12,000 years ago. A new study sheds light on how long humans in the Americas have had relationships with the ancestors of today's dogs -- and asks an 'existential question': What is a dog? "Dog is man's best friend" may be an ancient cliché, but when that friendship began is a longstanding question among scientists.

A new study led by a University of Arizona researcher is one step closer to an answer on how Indigenous people in the Americas interacted with early dogs and wolves.

The study, published today in the journal *Science Advances* and based on archaeological remains from Alaska, reveals a significant discovery. It shows that people and the ancestors of today's dogs began forming close relationships as early as 12,000 years ago—about 2,000 years earlier than previously recorded in the Americas.

"We now have evidence that canines and people had close relationships earlier than we knew they did in the Americas," said lead study author François Lanoë, an assistant research professor in the U of A School of Anthropology in the College of Social and Behavioral Sciences.

"People like me who are interested in the peoples of the Americas are very interested in knowing if those first Americans came with dogs," Lanoë added. "Until you find those animals in archaeological sites, we can

speculate about it, but it's hard to prove one way or another. So, this is a significant contribution."

Lanoë and his colleagues unearthed a tibia, or lower-leg bone, of an adult canine in 2018 at a longstanding archeological site in Alaska called Swan Point, about 70 miles southeast of Fairbanks. Radiocarbon dating showed that the canine was alive about 12,000 years ago, near the end of the Ice Age.

Another excavation by the researchers in June 2023—of an 8,100-year-old canine jawbone at a nearby site called Hollembaek Hill, south of Delta Junction—also shows signs of possible domestication.

### **The Smoking Gun? A belly of fish**

Chemical analyses of both bones found substantial contributions from salmon proteins, meaning the canine had regularly eaten the fish. It was not typical of canines during that time, as they hunted land animals almost exclusively. The most likely explanation for salmon showing up in the animal's diet?

### **Dependence on Humans.**

This evidence is crucial because it suggests that the canine was not hunting for salmon in the wild, but was likely dependent on humans for its food, a key indicator of domestication. "This is the smoking gun because they're not going after salmon in the wild," said study co-author Ben Potter, an archaeologist with the University of Alaska Fairbanks.

The researchers are confident that the Swan Point canine helps establish the earliest known close relationships between humans and canines in the Americas. But it's too early to say whether the discovery is the earliest domesticated dog in the Americas.

Potter said that is why the study is valuable: "It asks the existential question, what is a dog? This question delves into the very essence of the human-dog relationship, challenging us to reconsider our understanding of these animals."

The Swan Point and Hollembaek Hill specimens may be too old to be genetically related to other known, more recent dog populations, Lanoë said.

"Behaviorally, they seem to be like dogs, as they ate salmon provided by people," Lanoë said, "but genetically, they're not related to anything we know." He noted that they could have been tamed wolves rather than fully domesticated dogs.

### **'We still had our companions'**

According to study co-author Josh Reuther, an archaeologist with the University of Alaska Museum of the North, the study represents another chapter in a longstanding partnership with tribal communities in Alaska's Tanana Valley, where archaeologists have worked since the 1930s. This collaborative approach ensures that the research is respectful and inclusive.

Researchers regularly present their plans to the Healy Lake Village Council, representing the Mendes Cha'ag people indigenous to the area,

before undertaking studies, including this one. The council also authorized the genetic testing of the study's new specimens.

Evelynn Combs, a Healy Lake member, grew up in the Tanana Valley, exploring dig sites as a kid and taking in what she learned from archaeologists. She's known Lanoë, Potter, and Reuther since she was a teenager. Now an archaeologist herself, Combs works for the tribe's cultural preservation office.

"It is little -- but it is profound -- to get the proper permission and to respect those who live on that land," Combs said.

Combs said Healy Lake members have long considered their dogs to be mystic companions. Today, nearly every resident in her village is closely bonded to one dog. Combs spent her childhood exploring her village alongside Rosebud, a Labrador retriever mix.

"I really like the idea that, in the record, however long ago, it is a repeatable cultural experience that I have this relationship and this level of love with my dog," she said. "I know that throughout history, these relationships have always been present. I love that we can look at the record and see that we still had our companions thousands of years ago." This study not only provides scientific insights but also resonates with our shared cultural experiences.

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