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Digging Up Bones

Prehistoric burials add to our understanding of the long, long relationship between people and dogs. By Jane Brackman, PhD

Studies of prehistoric dog burials have been making splashy headlines lately.

Although the popular press would have us believe that these finds are proof of the affectionate relationship our ancestors had with dogs, the unifying theory that gives meaning to burial patterns remains elusive because ancient people left no written record.

What little we know about dogs' social roles in antiquity is a patchy mosaic of information derived from physical analysis of bones excavated from gravesites. The accuracy of this mosaic has been further complicated by archaeologists' long-standing difficulty with reliably distinguishing between wolves and dogs, not only because the two animals look similar, but also because changes in morphology during the early stages of domestication were subtle.

However, in 1986, zooarchaeologist Darcy Morey, now adjunct professor in anthropological sciences at Virginia's Radford University, developed a statistical equation to more accurately identify dissimilarities between skulls. A decade later, geneticists were able to extricate even more conclusive information from DNA. Then, in a landmark paper published in 1999 in the *Journal of Heredity*, geneticists Carles Vilà, Jesus Maldonado and Robert Wayne suggested that the first domestication event occurred more than 100,000 years earlier than dog burial remains suggested. This marked the beginning of a decades-long trend that all but excluded archaeology and other academic disciplines from the equation.

Morey—and later, Greger Larson, evolutionary biologist in Durham University's Department of Archaeology in the UK—challenged the exclusive use of DNA analysis to identify the time and place of the first domestication event. They advocated a return to a cross-discipline approach that included traditional archaeology, DNA analysis, isotope geochemistry and radiocarbon dating in the context of environmental sciences such as paleoclimatology and biogeography.

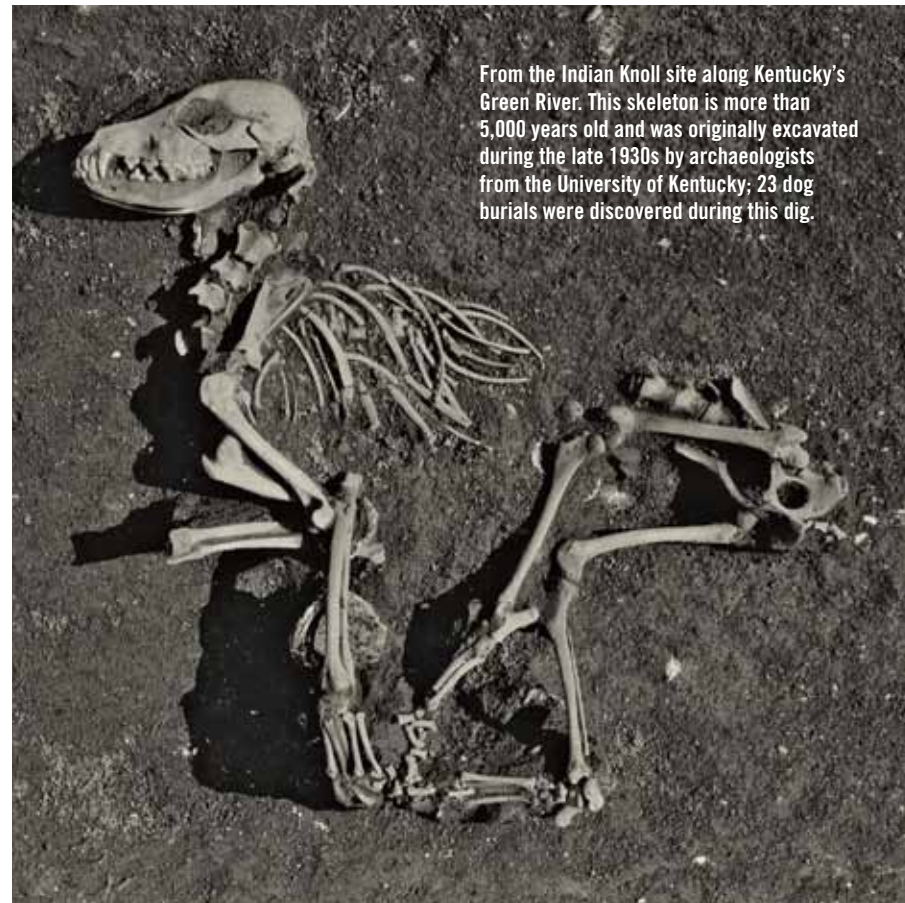
Robert Losey, associate professor of anthropology at the University of Alberta, is among the scholars who agree with this approach. “When the genetic information can be integrated with information on dogs’ diets, diseases, activity patterns and archaeological context, we get a much more complex and informative picture of people’s emotional and day-to-day lives with their animals than we can through genetics alone.”

Applied Forensics

Siberia’s Lake Baikal, the largest and oldest freshwater lake in the world, is known for its well-preserved Middle Holocene (3,000- to 9,000-year-old) hunter-gatherer cemeteries, which attract scientists studying how social and environmental pressures influence long-term cultural change. Leading a team of researchers from various disciplines, Losey analyzed numerous Lake Baikal sites containing human, dog and wolf remains dating back 5,000 to 8,000 years; the team’s findings were published in 2011 in the *Journal of Anthropological Archaeology*.

As he explained, “What I tried to do in my study was to approach these dog skeletons just like we would a human skeleton. We applied a suite of analyses in order to tease out the interesting and relevant details of their lives. The best way to fully understand the domestication of dogs is to use as many forms of evidence as possible, and to employ a wide range of specialists.” Their interpretive model was partly based on ethnographic records of indigenous groups from across the northern hemisphere. For example, many northern people, who have an animistic understanding of their world, strongly believe that animals, plants and inanimate objects possess souls.

Using stable isotope analysis, researchers determined that dog and human diets were the same. In comparison, a wolf found buried in the same area had foraged on large game, a diet different than that of local people. Some dogs were buried with artifacts the dog



From the Indian Knoll site along Kentucky’s Green River. This skeleton is more than 5,000 years old and was originally excavated during the late 1930s by archaeologists from the University of Kentucky; 23 dog burials were discovered during this dig.

would have used or been familiar with during its life: a decorative collar-like pendant made with red-deer teeth, a round ball-like stone, spoons, antlers and other implements.

Bone-wear suggested that the dogs had worked alongside people, likely as transport animals hauling heavy loads. Some had recovered from injuries that would have required special care. People and dogs were buried near one another in the same cemetery, and in some cases, were buried together (in one instance, a man was buried with two dogs, one on either side). Analysis of the dogs’ skeletons revealed a resemblance to modern-day Siberian Huskies, although they would have been larger. Genetic work on the specimens confirmed an ancestral link to our modern dogs.

According to Losey, “I think what we are really looking at is a set of relationships between people and dogs, and to study relationships, we need to try to understand the life histories of animals,

not just their evolutionary history.”

Putting all of the small parts together, the researchers painted a big picture. They suggested that ancient indigenous people considered some dogs to be very special. Unlike the majority of simpler animals, whose spirits collectively recycled after death, these dogs were thought to be like humans, with powerful and unique souls that required mortuary rites similar to those of deceased people.

This special treatment was necessary for both dogs and humans so that their souls could return in new individuals. Losey added, “I think the act of treating a dog as a human upon its death indicates that people knew it had a soul, and that the mortuary rites it received were meant to ensure that this soul was properly cared for. These practices also clearly indicate that people had close emotional bonds with some of their dogs, and perhaps mourned their loss like they did [the loss of] their own family members.”



Artist’s rendition of canid burial



Buryat shaman on Olkhon Island, Lake Baikal.



Mummy of a dog dating between 1100 and 1300, southern Peru.



Siberia, Lokomotiv canid burial, roughly 8000 years BP.

Waves of Proto-domestication

Although romanticized images of digs in the shadows of ancient civilizations continue to feed the popular notion of archaeology, a more accurate but less dramatic scene would have scientists in white lab coats conducting microscopic analyses of polymorphic nucleotides extracted from bone remnants stored for many decades on museum shelves. Indeed, bones unearthed long ago have proven to be quite revelatory. The most unexpected discoveries regarding the human/dog relationship are based on analyses of materials extracted from canid bones excavated, catalogued and archived in 1873 and 1884, respectively.

The oldest skull, which dates to 31,700 years ago, was found at Belgium’s Goyet Cave. Another from a site in Predmosti in the Czech Republic proved to be about 27,000 years old. One skull from the Predmosti site had a mammoth bone fragment in its mouth. Does it indicate that a special connection had developed between people and dogs as

far back as 30,000 years ago? Archaeologist Mietje Germonpré of the Royal Belgium Institute of Natural Sciences—lead author of the two papers describing the 2008 and 2012 research results—said, “I believe that the dog skull with the bone between its teeth suggests some sort of ritual treatment. The position of the bone fragment in the mouth suggests that it was inserted between the incisors of the dog post-mortem.” The ethnographic record indicates that placing body parts between the teeth of dead carnivores was a common practice in many cultures. Exactly why remains open to speculation.

Paleoanthropologist Pat Shipman, who has written extensively on the evolutionary impact of the human/animal connection, suggested that the mammoth bone points to a cross-species alliance that may have developed even earlier—one that might account for the success of our early ancestors. She hypothesized that proto-dogs, like those found at the Predmosti site and at

Goyet, cooperated with humans in a symbiotic hunting partnership that could account for the significant and abrupt increase in the number of animals found at mammoth kill-sites dating as far back as perhaps 45,000 years. The initial domestication of dogs may have been accidental, but once humans realized the value of these living “tools,” they began to refine them for increasingly specialized purposes.

In a separate study, a group of researchers led by Ole Thalmann examined ancient DNA of Eurasian dogs (the Predmosti dogs had not been genotyped) along with others, and came up with some surprising results. Separated by only a few thousand miles and a few thousand years, the ancient dogs were not related to each other, nor were they related to modern dogs. In addition, none of the lines survived, which suggests that domestication experienced many starts and stops in different regions with different wolf populations. Scientists speculated that the last ice age, which began about 26,000 years ago, might have contributed to this stutter-step process. They also found that living dogs are more closely related to ancient, extinct wolves than they are to modern wolves.

If domestic dogs somehow catastrophically died out, would we have the natural resources needed to recreate them? In Shipman’s opinion, “The answer is both no and yes. If dogs disappeared, they probably couldn’t re-evolve from the wolves we have now. But those extinct wolves evolved into contemporary wolves, and canids in general have a huge amount of variability in their genomes, which is why we have so many different types of dogs today. If by ‘dogs,’ you mean a highly variable canid that can live with and cooperate with humans, then I think the answer is yes. Would it be the same dog as today? We can’t be sure.”

Laid to Rest with Care

In the past two decades, archaeologists have unearthed the remains of about 1,400 dogs buried 2,500 years ago on

Courtesy William S. Webb Museum of Anthropology, University of Kentucky, Lexington

Clockwise from top left: Courtesy Robert J. Losey, Reuters/Mariana Barzot; Courtesy Robert J. Losey, Arkady Zarubin/Wikimedia Commons

prime ocean-view real estate in ancient Ashkelon, today a thriving city located on the Mediterranean Sea, 30 minutes from Tel Aviv. The dog burials spanned a period of eight decades. Carefully positioned alone in shallow pits, the dogs' bodies were placed on their sides, legs flexed, tails gently tucked around their hind legs. Ranging in age from newborn through elderly, they appear to have died of natural causes.

Ashkelon is only one of thousands of ancient dog-burial sites scattered across the globe, and its large number of burials raises the question, "How many dogs were buried in antiquity?" The answer is, "We'll never know." Throughout prehistory, people mostly disposed of bodies, human and non-human, in untraceable ways; they sent them floating down rivers or buried them in shallow earthen graves—reverent practices that lost them to the ages.

In addition, dog burials were so common that they are field sites' most overlooked artifacts. In her 2009

manual, *A Practical Guide to In Situ Dog Remains for the Field Archaeologist*, Susan Crockford, adjunct professor at the University of Victoria in Canada who has worked with dog remains for more than 20 years, maintains that far more dog burials are encountered than are ever mentioned in archaeological site reports. Workers aren't properly trained to recognize dog remains, nor do most understand the history of dogs and their significant contribution to the human story. Consequently, much of what we could have learned about the human/dog connection has been lost forever.

Furthermore, scientists can't develop statistical estimations because it's unclear whether or not dog burials are representative of the total dog population. However, by calculating the timing of genetic bottlenecks, Thalmann and his colleagues suggested that ancient dog populations paralleled the trajectory of human population growth. Dog numbers increased steadily until

about 5,000 years ago, then abruptly declined, followed by a sharp increase 2,500 years later. Even if their calculations are proven accurate, whether (and why) certain dogs were selected for burial while others were not remains unclear.

The first comprehensive review of dog burial studies, "Burying key evidence: the social bond between dogs and people," by Darcy Morey, published in the *Journal of Archaeological Science* (2006), put the documented cases and site locations in perspective. Written for a scholarly audience but with enough humanity to appeal to lay readers, the paper brought new attention to a topic of inherently widespread interest. Given that so many burials are untraceable and others are uncertain, why even suggest a total?

Professor Morey said, "Depending on circumstances, for a given site, I think it's possible to suggest how many were buried, at least in that place." In a later book, *Dogs: Domestication and the*



Fossilized Paleolithic dog skull discovered at Predmosti in the Czech Republic, with a bone (thought to be from a mammoth) protruding from the jaw. Researchers believe it was inserted there by humans after the dog's death.

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Development of a Social Bond, Morey included an appendix that inventoried dog burials, including totals as known from specific places. "But," he added, "given frequent uncertainties, I think in general that suggesting combined totals is fraught with problems."

Together Forever

As companions and helpers, dogs hold a special place in our hearts, and increasingly, as our equals in relation to our place in the collective physical world. Mary Elizabeth Thurston, author of *The Lost History of the Canine Race*, anthropologist and historian for Hartsdale Pet Cemetery in Westchester, N.Y., said, "Fifteen years ago, about 55 percent of the public believed pets deserve mortuary rites in death. Today, the number is much higher."

Thurston also noted an uptick in the number of people who wanted to be laid to rest with their animal companion, either by arranging for their own cremated remains to be buried with

The grief felt at the death of that pet is profound, and people want to accord their animals a measure of respectful remembrance in death, just as [they] would any other family member.

the pet, or for the cremated remains of that animal to be interred with them. "When animals fill an innate need for companionship as either surrogate children or life partners, they become truly indispensable in the eyes of their human caretakers. The desire to be together is understandable. The grief felt at the death of that pet is profound, and people want to accord their animals a measure of respectful remembrance in death, just as [they] would

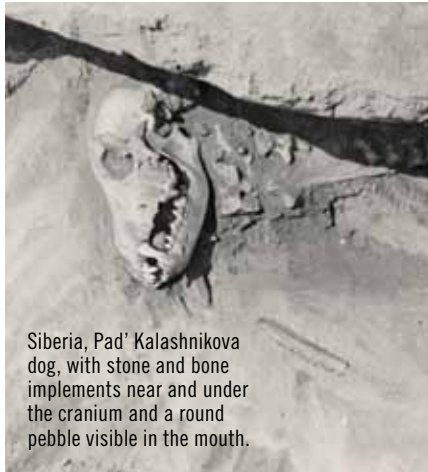
any other family member. However, we can't assume that ancient people, who left no written records, held our same modern sensibilities."

Canine remains in ancient human burial pits more often indicate that the dog was part of an offering, sacrifice or spiritual ritual rather than a companion. Thurston suggested that the ancient interment of single animals with grave goods, especially things that the dog used in life, along with evidence that shows the dog died of natural causes, might suggest an affectionate relationship and the belief that the animal had a soul—that, like people, it would need these things on the "other side" for a good life.

In "Peru's Mummy Dogs," writer Roger Atwood noted that in 2007, Sonia Guillén, archaeologist at the Maliqui Center in Ilo, Peru, reported that her team had discovered 40 dogs buried about 1,000 years ago in separate plots alongside the remains of what were probably their owners. The

discovery was unusual in that the dogs were interred with items that look like toys and food. As Guillén, who studies Peru's Chiribaya culture (which pre-dated the Incas), told the press, "We have found that in all the cemeteries, always, in between the human tombs, there are others dedicated to the dogs, full-grown and puppies. They have their own graves, and in some cases they are buried with blankets and food." Guillén, who suspects that the dogs may be direct ancestors of the companion and working dogs who populate the village today, is collecting DNA for future study.

Most human/dog burials occurred 5,000 to 8,000 years ago in hunter-gatherer societies and disappeared with the beginning of the agrarian era. But their absence doesn't equate to a lack of an affectionate human/dog connection. At the Lake Baikal site, when pastoralists inhabited the area beginning about 5,000 years ago, they did not bury dogs, at least not in areas where archaeologists might find them. According to Robert Losey, "The difference between



Siberia, Pad' Kalashnikova dog, with stone and bone implements near and under the cranium and a round pebble visible in the mouth.

the pastoralists and the hunter-gatherers living in this area of Siberia is that the hunter-gatherers buried some of their dogs in cemeteries used otherwise for the human dead. The pastoralists do not appear to have done this.

"Over the past few years, my colleagues and I have interviewed local Buryat people, who are descended from some of these early pastoralists, about their dogs, and they clearly have a deep respect for [them], and do bury some of them. However, they are not considered

non-human persons with individual souls, and in the local belief systems, are not spiritually equivalent with humans. So, they cannot be buried in local cemeteries. The best dogs, and the most loved ones, are given burial rites in some cases, but these tend to be elsewhere—on the tops of hills or mountains, for example. Some folks even recounted that they left pieces of meat in the graves with the dogs—food for them in the afterlife."

Dogs have been buried more often than any other animal: singly, with other dogs, near people and with people. This ancient practice was a global phenomenon, one that crossed nearly all cultural boundaries. Precisely why dogs were buried may never be clearly understood, but the universality of the practice suggests it may be embedded in the human psyche and accordingly, is a fundamental part of the human/dog connection. 🐾

For in-depth information on sources cited in this article, go to thebark.com/bones.

The photo of the canine skeleton on p. 84 has been previously published in the *Journal of Archaeological Science* (v. 33, D. Morey, "Burying Key Evidence") and in D. Morey's book, *Dogs: Domestication and the Development of a Social Bond* (2010, Cambridge University Press).

Courtesy Robert J. Losey



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