Is Forensic Science Going to the Dogs?
Douglas Page
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To some, canine forensics is still a bone of contention.

When it comes to cold cases, few are hotter than those associated with the notorious Barker Ranch, the last hideout of the Charles Manson Family before their arrest in October 1969, following a fierce Los Angeles murder spree.

Rumors have lingered for decades that buried bodies of other Manson victims – perhaps runaway teens who encountered the gang somewhere in the desert – may lie in clandestine graves on the rugged desert barrens near the ranch house on Death Valley National Park's southwestern fringe. Despite past digs, no bodies were ever found.

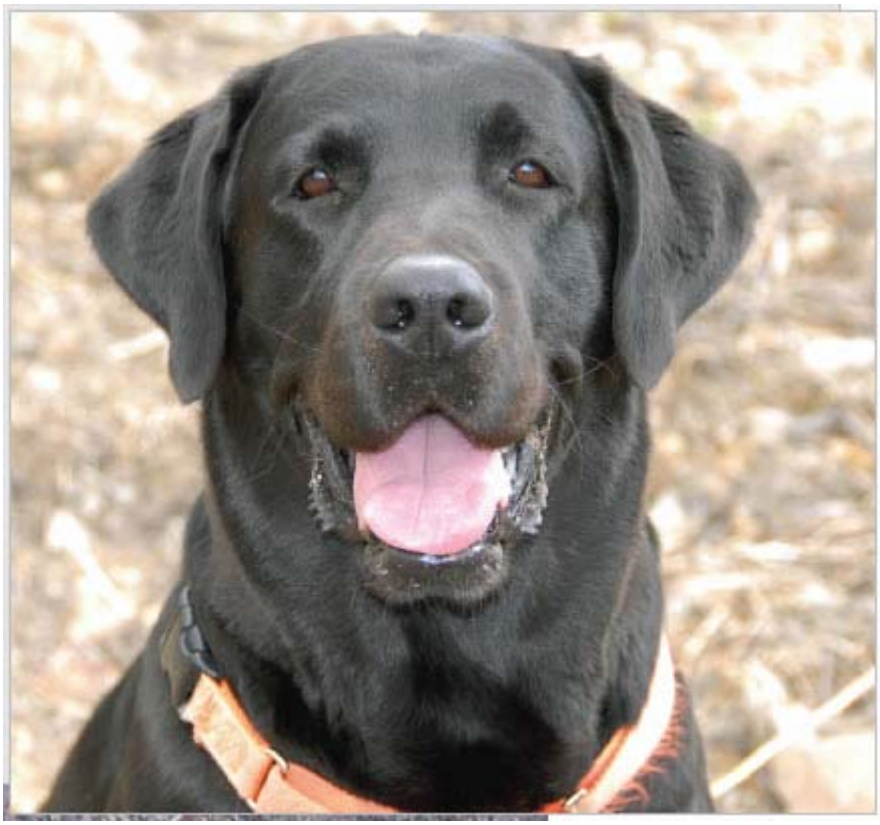
Manson follower Charles D. (Tex) Watson denies there are other victims buried at the Ranch. Watson, who is serving a life sentence for seven counts of murder, claims on his website (http://www.aboundinglove.org/) to know of no one buried there by the Manson Family:

"The only runaways I knew at Barker Ranch . . . were picked up by the California Highway Patrol. There are only two faithful members of the old Manson family left. It stands to reason that if there were bodies buried at Barker Ranch, at least one of the rest would have come forward with reliable information during the past forty years."

Results of a recent search by human remains detector dogs (HRD) and two scientists from Oak Ridge National Laboratory, seem to dispute Watson's claim.

When Buster, a 5-year old pure bred black Labrador Retriever who belongs to Mammoth Lakes, California police detective Paul Dostie, was turned loose behind the ranch house last year, he alerted on several potential grave sites. Locating old graves is a game to Buster. He darts through the brush, nose to the ground, searching for scents related to human decomposition. When he yelps once and lays down, it means he's found one. It also means he gets a reward – a favorite toy to play with.

Later, five other human remains detection dogs alerted on one of the spots Buster found, and four alerted on a second Buster site. For confirmation, Dostie called in human remains scent experts from Oak Ridge National Laboratory.



Human remains detector dog, Buster.
(Photo by Paul Dostie.)

The main house at the abandoned Barker Ranch in Death Valley, where the Manson Family was apprehended in 1969. It is suspected that other murder victims may lie buried in clandestine graves near the house.
(Photo by Paul Dostie.)

Human remains detector dogs have identified several potential clandestine graves on the arid grounds of Barker Ranch near Death Valley. (Photo by Paul Dostie.)

THE OAK RIDGE BOYS

In February 2008, Oak Ridge senior research scientists Arpad Vass and Marc Wise accompanied Dostie to the Ranch. Vass is also affiliated with the Body Farm, a University of Tennessee research facility devoted to studying the decay of human remains in various environments and conditions – information useful in murder investigations.

Using instruments capable of detecting chemical evidence of decomposing human bodies, including a gun-shaped air sniffer and an infrared spectroscope to read molecular profiles, the sites found by the dogs were confirmed. The instruments and the dogs agreed that the sites contained scents produced by decaying human remains.

“We detected human decomposition products in some, not all, of the locations where Buster alerted,” Vass said. Vass’ research indicates that over 450 chemical compounds are emitted during the decomposition cycle. Some of the more interesting and unique chemicals are fluorinated compounds. Vass believes these compounds form during a person’s life from the fluoride added to drinking water and are slowly released after death.

When four of the sites were excavated in May, however, no human remains were found. Does this mean the dogs and the instruments were wrong? Not necessarily. Both Dostie and Vass suspect there could still be bodies buried out there, that it’s not always as easy as smell-dig-find.

“Odor from a decomposing body does not always migrate straight upward, particularly in the desert environment like that at the Ranch,” Vass said. The hard, crusty layer below the surface tends to block odor raising from below, deflecting it laterally through the loose, fine gravel lens that exists a meter or so down. No one really knows how far odor can traverse this way, but Vass believes it could travel as much as 10 meters or more sideways before finding a way to the surface.

“Shrub root systems break through the crust, and that’s typically where the odor is coming up, around the shrubbery,” he said. “That’s where Buster tended to alert.”

That’s also where they excavated. If the researchers are right about the odor deflection, it’s possible the holes were dug some distance from where the bodies may actually lie, which would explain smell-dig-no find.

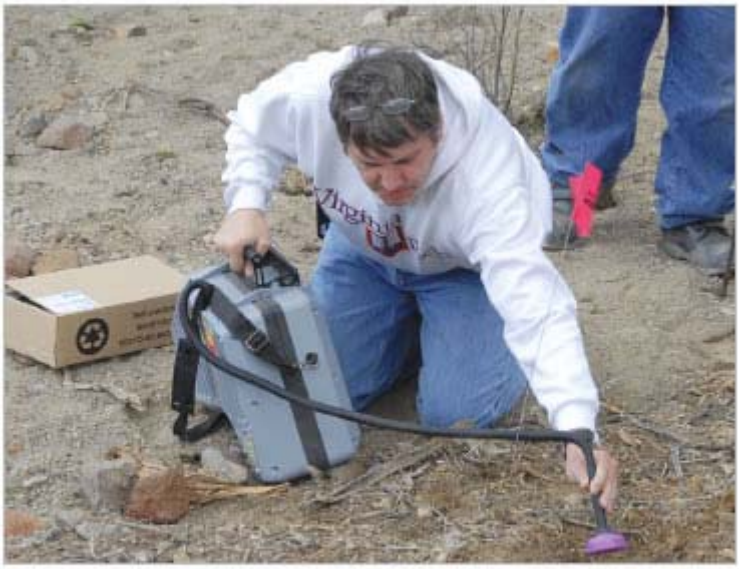
Plants also absorb some of the compounds emitted during human decay, which is another reason why HRD dogs sometimes alert either on or near vegetation. This is one of the liabilities of all HRD canines. The dogs may be well-trained and alerting where they should, but it's not always where the body is.

"The dog is trained to pinpoint where the largest scent source is, which may not be near the body," Dostie said. Bodies can also be wrapped or enclosed in some kind of material, blocking scent from reaching the surface directly, forcing odors to leech laterally.

Vass said because odors from decomposing human bodies don't always rise straight up, HRD canines have gotten a bad reputation over the past several years.

"They'll alert somewhere, you excavate the site, and you don't find anything – but you may have missed the body by two or three meters, or more," he said. "Their ability to detect these sites, while poorly understood, uncharacterized, and un-standardized, is nevertheless impressive."

Oak Ridge scientists Marc Wise (l.) and Arpad Vass inspect a potential grave site identified by a human remains detector dog. (Photo by Paul Dostie.)



Arpad Vass samples organic compounds from the desert soil. A human remains scent exert, Vass has identified some 400 fluorinated hydrocarbon compounds he believes are released by the decaying human body. (Photo by Paul Dostie.)

WAR OF THE NOSES

The current lack of strict standards and training protocols is one controversy swirling around canine forensics.

“Poor certification or no certification, sloppy training, and agency misuse of dog resources are some of the problems we see,” said Adela Morris, of the Institute for Canine Forensics (ICF), a California organization Morris formed to promote research and education of forensic evidence and human remains detection dog teams.

Because there are no strict training or certification standards, some agencies like the FBI have only a few dog teams that they use and trust, Morris said.

David Latimer, president of the World Detector Dog Organization and owner of an Alabama company called Forensic and Scientific Investigations, believes things are improving, that the trend is slowly moving toward double blind, third party certification testing of dogs.

“There’s a slow but irreversible erosion of the ‘good old boy’ syndrome,” he said.

This trend is driven by dog trainers and handlers who realize that a scientifically valid method of certification testing is the only way to prevent the loss or restriction of scent detection canines as an investigative tool.

There are other issues with canine forensics that makes the field controversial. The term, “canine forensics,” alone stirs the passions of some in law enforcement.

“Some members of the law enforcement community claim there is no such thing as ‘canine forensics’,” said Eva Cecil, an ICF board member.

This skepticism appears partly etymological in nature. “Forensic,” by definition, relates to or deals with the application of scientific knowledge to legal problems. In a recent K9forensic forum exchange online, one police officer said she would not like to have to articulate on the witness stand exactly how that applies to a scent detection dog.

Semantics is also involved. Technically, human remains detection dogs don't actually detect human remains, they detect the scents that emanate from human remains – just the sort of ambiguity defense attorneys love to exploit.

Another reason for police skepticism is that most human remains detection dogs are handled by civilians, not by police. Few police officers handle human remains detection dogs.

Most police agencies do not have the financial or personnel resources available to commit to human remains detection teams. Dostie is an exception.

Dostie handles and trains his own dog. The nonconformist Mammoth Lakes detective makes a habit of stretching the forensic science envelope. He has spent the past five years attempting to identify the female victim of a mountain murder, probing beyond conventional forensic science at every turn. (see Forensic Magazine®, June/July 2007).

"There is nothing wrong with trying to be the first in forensic experimentation," Dostie said.

Dostie and others are currently attempting to orchestrate a suitable protocol to govern investigation of clandestine graves using Buster and other human remains detection dogs.

NOSE FOR TROUBLE
Like relief pitchers, forensic canines are sub-specializing.

"Scent dogs are also being trained to detect everything from estrus cycles in cattle to contaminants in catfish ponds to cancer in humans," Latimer said. Dogs are commonly used by police to locate suspects, narcotics, and explosives, and by arson detectives to discover the presence of accelerants.

"We may ultimately see dogs use scent to discriminate between individuals, much as fingerprints do now," Latimer said. The use of scent identification dogs is becoming acceptable in Europe.

Dogs are also widely used by police, military, and civilian agencies in search and rescue, as well as to help locate victims of natural or mass disasters. In fact, the need for human remains detection dogs evolved from their search and rescue kin.

Search and rescue dogs were originally trained to locate lost, living people, but when a lost person expires, the scent changes rapidly to odors with which search dogs are unfamiliar.

"Search dogs not imprinted on human remains scent would not reliably alert if the person had died," Morris said. "Today, almost all search dogs are also cadaver trained."

Morris was instrumental in the shift from cadaver to human remains detection when the question arose, if cadaver dogs could be trained to find recently drowned or buried bodies, could they also be trained to find human graves and old human remains. In 1997, Morris formed ICF to specialize in dogs trained in human remains detection only. HRD dogs are never trained to locate live humans.

Both Morris and Cecil have subsequently done pioneering work in training dogs for historic grave detection. Morris and her dog Cholla did the first testing on the cemetery grounds of an old mental facility in Santa Clara, California, in the late 1990s.

"Not only can they find recent human remains, they can find ancient human remains, as well," Cecil said.

Morris said human remains detection dogs are different than wilderness search dogs.

“HRD dogs are trained to work slowly and methodically, to search for small scent sources, sometime no larger than a single tooth,” she said.

It seems improbable that a dog can find one old tooth on a 20-meter stretch of dirt road, but this is done in training on a daily basis, according to Cecil.

ICF members include about 20 handler-dog teams available for everything from police mutual aid to helping Native American tribes search for lost graves. Once, NASA needed help. When the space shuttle Columbia exploded in 2003 on reentry over east Texas, Cecil and Ness, her 8-year old Border Collie, were sent to help determine whether items found by ground search parties were human or not.

Hunting and herding dog breeds, such as Labrador Retrievers, Golden Retrievers, Australian Shepherds, and Border Collies, are usually best suited for this type of scent detection work. When properly raised, they are fond of cooperating with humans, are naturally good at observing their surroundings, and are willing to follow commands.

A good breeder knows the characteristics of his line and can help pick a puppy that is inquisitive, ready to follow, has high food, play, and hunt drives, and will also not be bothered by loud noises or sudden changes in the environment.

Cecil said it can take a year or two to bring a dog to a point when it can be tested and certified.

“It’s fascinating, challenging work,” she said. “The scale of scent a cadaver dog or a historical human remains detection dog has to learn is enormous.”

Latimer believes canine forensics will continue to build on its reputation within the scientific and legal communities.

“But that will only happen if we work on improving the profession and policing ourselves rather than waiting for legal decisions in big cases to dictate the way we do things,” he said. “If we are proactive enough, many of the legal challenges can be avoided.”

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