

FORENSIC EVIDENCE CANINES: STATUS, TRAINING, And UTILIZATION

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Introduction

A common problem in death investigation is the finding and identification of objects and places associated with either the commission of an incident or the actual location of a decedent's body. Weapons and instrumentalities of death are often disposed of in natural areas: objects, clothing, and vehicles may be cleaned in an attempt to remove evidence of blood and tissue; bodies are buried in remote areas or with associated efforts to conceal burial (e.g., a new concrete patio.) Once an object or place is located, standard criminalistic, archeological, and forensic investigative methods can be used to make the victim/perpetrator/place/object linking.

Various methods are utilized to locate an object of interest. Depending upon the issues to be resolved, investigators may use technical methods such as infrared aerial imaging or metal detectors; personnel-intensive methods such as grid searching or ground probing; or an area may be searched with trained dogs.

This monograph concerns the issues associated with the use of specially trained canines in the pre-scientific phase of death investigation.

The image of a working dog in both the popular and professional mind is primarily provided by the media. Canines are associated with law enforcement arrest activities, avalanche rescue, and wilderness lost-person searching. Animals trained to the scent of explosives, accelerants, or drugs are routinely utilized to protect the public and to build probable cause for a search. Few people are aware, however, of the use of specially trained canines for the location of human remains and objects of forensic interest.

The rapid proliferation of law enforcement and ancillary personnel making widely varied claims about the use of dogs trained to cadaver scent, and the lack of any significant literature on the subject, prompted the authors to research what training and performance requirements might be important for consideration in the use of dogs in the gathering of evidence having forensic importance. As will be seen, these considerations have significance, particularly in regard to training, investigative direction, and search and seizure issues. The material discussed herein should be of interest to the criminal defense bar, in addition to dog trainers, law enforcement personnel, coroner's investigators, and prosecutors.

Historical Information, Breeds, and Nomenclature

Dogs have a long history of use in law enforcement, military, and search and rescue operations. They are used for protection, attack, tracking, searching, and evidence locating. The public image of a canine used in any type of field situation is that of the typical large-bodied working dog, such as the German Shepherd or Doberman; a potentially fearsome animal is necessary when the possible outcome is that the dog

must be capable of inflicting harm on a human. In search and rescue, a robust animal may be necessary to move through particular types of terrain. Certain types of tracking require an animal with a breed-specific ability to highly discriminate among diverse human scent, such as a Bloodhound. In forensic work, however, the animal's size is not as important as is its ability to learn, interact with its handler, and to discriminate a particular scent (e.g., decomposed human tissue, explosives, or drugs.) Many small purebred and mixed breed dogs are now being used where selection of an appropriate animal can focus on specific scenting ability rather than physical size.

In preparing this paper, the authors found that there is no standard terminology for describing and differentiating among canines trained for particular tasks. Therefore, we propose and use the following terminology:

Search Dog

A non-specific term referring to a canine trained for any type of searching based upon visual, olfactory, or auditory clues.

Tracking Dog

A canine with the specific ability and training to track and locate a specific human on the basis of scent.

Air-Scent Dog

A canine with the ability and training to locate the presence of a human in a particular area. This is the standard for dogs used in wilderness search for lost persons

Cadaver Dog

A narrow term, used in a search-and-rescue context, to indicate a canine primarily trained as a tracking or air-scent dog that has also received cross training in the location of dead human bodies.

Decomp Dog

A term used to describe a canine that will indicate when a scent source is human tissue, blood, semen, urine, feces, and materials that have been handled and worn by humans; often cross trained for other purposes.

Forensic Search Dog (The primary focus of this paper)

A canine that has been specifically trained to indicate a scent source as being from decomposed human tissue. Such animals are also trained to exclude (deconditioned to) the scent of human urine, feces, and semen and will not alert on residual scent from a live human; and have never been trained to locate any scent other than that of decomposed human tissue.

Judicial Ramifications

It is commonly thought that dogs are only valuable in locating someone or something. Actually, properly trained canines can provide information that is useful in molding investigative direction in addition to aiding the formation of probable cause to search.

Most present case law on the use of dogs trained for a specific scent relate to drug and contraband seizure in a customs or law enforcement situation. There is seldom a search and seizure question when a trained dog locates a body or bloody knife in a public wilderness area.

A legal citations database, current through 1997, was searched with various keywords. Cases found related to contraband seizure; probable cause in drug, explosive and accelerant matters; and tracking of a suspect during hot-pursuit situations. No cases were found that involved the use of a dog trained to scent decomposed human tissue to build probable cause.

Recently, related legal issues have been raised by professional organizations regarding potentially improper and possible misleading testimony by dog handlers in accelerant detection cases. -1

Numerous citations recognize the scientific validity of dogs to discriminate scent and produce reliable identification in tracking and lineup situations. -2

Testimony in cases where a dog's behavior is indicative of a particular scent is normally allowed since other conditions and circumstances generally build probable cause. In some cases, the dog handler is essentially allowed to offer an expert opinion about what the dog's behavior indicates. In actuality, however, the dog's behavior is often circumstantial and demonstrative, rather than direct. The trier of fact may confuse the handler's testimony about the dog's behavior with the assumption that the dog's behavior is direct evidence, rather than an inference.

Our research indicates that there may be significant ramifications to the use of dogs with certain forms of training if they are used to form probable cause in what is termed a "residual scent" situation. These issues are discussed below.

Physiology of Scent Discrimination

The major characteristic of the dog is its ability to discriminate among similar scents. The exact neural mechanism is unclear, but may anatomically relate to the large surface area provided by the turbinates and the extreme number of olfactory receptors. Some mammals (e.g., cats) have more olfactory receptors than canines, but the dog's physical, emotional, and behavioral characteristics make extensive training and field use possible.

There is dispute within the scientific community about what it actually is that an animal scents that allows differentiation. Some researchers maintain that bacterial action on biological material results in an outgassing of volatile fatty acids, methane, urea, cadaverine, and various ionic compounds. -3 Others believe that individual recognition occurs by differentiation at the level of the major histocompatibility complex (MHC) which causes unique protein markers to form on the surface of cells. -4 In any case, some form of chemical marking occurs that probably has evolutionary and organism-survival significance.

Issue of Residual Scent

Residual scent is that persisting in an area after the original source is no longer present. Scent persists in an area to the degree that environmental influences do not degrade whatever it is that forms the scent to the point that it either cannot be sensed or cannot be differentiated. In a tracking situation, a dog follows residual scent left by someone who has traveled through an area. In an outdoor search for decomposed remains, scent may drift and pool in low areas or may bank up against physical barriers such as trees or bushes. An experienced dog will usually work out this problem and eventually find the scent source. In situations where remains are actually found there is not much dispute about the effectiveness of the animal. What becomes problematic, however, is the situation where a dog is used to determine if decomposed human tissue was at one time present at a location on the basis of residual scent.

If a dog and handler "screen" an area merely for the purposes of setting an investigative direction, and there is an error on the part of the team, than all that is really lost is time and momentum. An example would be where there were several possible outdoor sites where a perpetrator may have committed a homicide, but it is not reasonable to foot search all of them for evidence. A screening of the locations could be made with dogs, and an area where a dog alerted or showed great interest would then be more carefully searched with sufficient personnel. This use of the dog's reaction to possible residual scent can serve the function of maximizing utilization of resources.

A different and more important consideration is one in which a dog's *alert* on possible residual scent is used as circumstantial evidence against a defendant at trial, (the situation where a dog is used to screen an area for residual scent based on the assumption that a criminal defendant had a body or decomposing human tissue at a particular location.) A hypothetical example would be a situation where a man was accused of murdering his wife, storing her body for a brief period in an outbuilding, and then later disposing of the body. Further hypothetically assume that the only evidence that could be offered that the body had been on the premises was testimony of a dog handler that his dog performed its trained alert when it entered the outbuilding. If the sequence of proof required that the location of the body be, within a certain time frame, in the outbuilding rather than anywhere else, then the dog handler's testimony becomes crucial.

Unfortunately, in such a situation the trier of fact may easily be misled as to both the accuracy and precision of the dog's actions: Accuracy in the sense that the dog (depending upon its level of training) may be reacting to something other than residual scent from decomposed human tissue; precision in that the dog may be reacting correctly to the scent of decomposed human tissue, but imprecise in the sense that the dog is not differentiating between whose decomposed human tissue is giving the scent. Further, there may be legitimate reasons for the scent being there: someone may have been injured and left bloody clothing there, someone may have left a used sanitary napkin, etc. Our research demonstrates that residual scent from decomposed human tissue persists in a closed building for many months at levels sufficient to cause a trained dog to alert.

The issues here are similar to those faced in the use of accelerant detection dogs in arson investigations. What is it that the animal is reacting to? Is the training level of the animal appropriate for the task at hand? Does the testimony of the handler merely consist of a recitation of observations, or is the handler figuratively testifying

as the spokesperson for the dog? Will the trier of fact be misled by the testimony and give more than circumstantial weight to the testimony so that improper inferences are drawn?

We believed that there were such significant questions relating to residual scent detection that our work should focus on those and related issues.

Prior Research

Little was found in the literature about scientifically based research on the effectiveness of, or proper training methods for, dogs used to detect decomposed human tissue. Nothing was found in the literature about research designed to address specific issues relating to residual scent, or the mixed questions of fact and law that arise when one is striving to offer testimony as an expert rather than an advocate.

There is a large body of work on various types of training methods for search dogs. Here is where a major problem originates: Most dog trainers and handlers are not forensic scientists, and have no experience with the legal ramifications of their training efforts as related to search and seizure. The proper training of forensic search dogs is much more rigorous and specific than that involved in the training and use of animals trained to search for lost persons or as a police tracking and attack dog.

Research Projects

The problems we identified are more than just seemingly esoteric. There are potentially significant issues of training and utilization that could make certain forms of testimony either misleading or totally unreliable. Our goal was to qualitatively examine certain dog behavior and training methods in order to make effective comments that would lead to progress in this field. By conducting two specific experimental protocols and numerous field activities we identified the major issue of residual scent as discussed above, and gained sufficient experience to form recommendations. The full description of these projects and findings will be explored in future papers.

Residual Scent Project

The purpose of this activity was to determine the length of time detectable scent remained in an enclosed structure following removal of scent items. The facility used was an abandoned portion of a state mental hospital. Scent items consisted of post-mortem body fluids and blood absorbed onto cloth and hair. These items were placed at various locations within the facility for five hours and then removed. Dogs at various levels of training were used to screen the facility at times up to fourteen months after removal of the scent items. Results were obtained and protocols used that are not discussed within this paper, however general findings were that residual scent remained for up to and beyond fourteen months.

Gauze Sponge Lineup Project

The purpose of this activity was to determine if dogs can differentiate between the scent of a live human and cadaver scent in the same lineup. Sterile gauze sponges were placed for twenty minutes on the unbroken abdominal skin of cadavers that were from one hour to seventy-two hours post-mortem. The gauze was placed, retrieved, and stored in a manner that limited contamination with other scent. At a later time, dogs in various stages of training were tested by using the scent-item gauze sponge in a lineup with other similar gauze sponges not bearing cadaver scent. One of the lineup sponges had live human scent. The shortest post-mortem duration that resulted in a correct selection was for a sponge placed on a cadaver that was one hour twenty five minutes post-mortem. In general, the average overall accurate response was about 50%, although this is most likely reflective of the various training levels of the dogs and handlers and the short scent adsorption time of twenty minutes.

Other Activities

Numerous task-typical field trials were conducted over a period of months using a variety of decomposed human tissues ranging from charred bone to entire fresh cadavers. Qualitative observations were made relating to dog field performance, handler interactions, and factors influencing and interfering with accurate results.

Conclusions and Opinions

Based upon our experiences in examining the above issues, we arrived at the following opinions and conclusions:

- 1) There is a significant potential for a dog handler to offer unintentionally misleading or improper testimony about the presence or absence of residual scent from decomposed human tissue.
- 2) Dogs specifically trained to detect scent of decomposed human tissue can be invaluable in resolving issues related to evidence gathering and determination of investigative direction. It is crucial, however, that dogs be used in situations appropriate to their training level, and that dog handlers are able to support their testimony about dog behavior with accurate training logs. Any canine used for forensic purposes in the location of the scent of decomposed human tissue should never be cross-trained for any other type of scent work if the results of the animal's activities and handler's opinions are to be used for the development of probable cause.
- 3) Existing training and testing techniques in the general community of handlers now working do not address the specific and rigorous training needs for dogs that are expected to reliably detect and alert on residual scent.
- 4) Research should be conducted to further identify behavioral expectations of forensic evidence dogs. Appropriate training protocols must be developed to continually lessen the potential that observations of the behavior of a dog might be misleading to a trier of fact. This includes educating trainers and handlers to the legal issues involved with formulation of probable cause and the ethical considerations inherent in expert testimony.

5) A severely fatigued dog can inadvertently be pressured to give a false alert because it wants to terminate the search in order to rest. Therefore, it is important to maintain the dog at a high level of physical fitness so that it may work for multiple hours with only brief rest periods.

6) Dogs used to develop probable cause based upon residual scent must be negatively conditioned to human urine, feces, and semen in order to ensure that the animal will not alert when encountering these substances during a search. All dogs, no matter what level of training, used in the detection of decomposed human tissue should be negatively conditioned to the scent of decomposed non-human tissue. It must be kept in mind, however, that many dogs will react or show interest to any decomposed tissue at certain short times during the decomposition process.

7) Training for dogs used in search-and-rescue for lost persons (cadaver dogs) and for general field searching to find visible decomposed remains is generally appropriate and effective for that type of situation, but not for highly specialized situations or to build probable cause based solely upon residual scent.
