Extract from:
The Police Dog: History, Breeds and Service

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Chapter 5

Canine Scent Work

Malinois tracking in the Schutzhund style, notice the intensity and nose pushed deeply in the grass. Line attached so as to pull nose down. Strap at rear unusual but permitted. Photo Donna Haynes

When the distant ancestors of mankind began to walk upright they greatly enhanced daytime visual effectiveness because the point of view was moved high above the ground, allowing the man to scan large areas and spot potential adversaries or prey at a distance. The placement of the eyes close together enhanced distant sight and depth perception, unlike a grazing animal such as an antelope or horse, where the eyes are placed for a wider view to detect a predator in any direction at the earliest possible moment. Depth perception greatly facilitated the eventual effective use of the bow and arrow or the throwing spear.

As in all evolutionary turning points compromises were inevitable, capabilities lessened as well as enhanced, for the nose of the upright human is far from the ground and thus much less effectively placed for the use of the olfactory capability. Most of the odors useful in seeking food, tracking or locating game or detecting the presence of potential adversaries reside in the layer of air close to the ground, held by the dampness and shade of the vegetation, resulting in a significantly reduced level of human olfactory acuity. In order to see further and better, and gain the use of his hands, man gave up much of the effectiveness of the ancestral scenting capability.

In the daylight the vision of a man is superior to that of his dog, which lives in a world of scent that is as literally beyond our comprehension as sight is beyond the man blind from birth. Relative to human beings, canine vision is much more effective at night, primarily motion sensitive and with much less capability to distinguish color. Visual acuity, the ability to perceive detail, is much less in the dog than in man.

Binocular vision, the overlapping field of view of the two eyes, is the foundation of depth perception. Thus the canine eye set determines the field of view and the effectiveness of depth perception. Relative to man, the dog has better peripheral vision and less effective binocular vision. The nose of the dog, always close to the ground, incorporating enormous nasal cavities, is much larger in size compared to a human being, and the cells for scent detection in the nasal passages are orders of magnitude more sensitive and numerous. The size and placement of the nostrils and nasal sensory organs is a design problem in that the eyes literally have to be placed so as see around the nose. While dogs in general have wider set eyes compared to human beings, and thus less effective binocular vision, there is significant variation

in breeds and regional types. The sight hounds, for instance, are much more visually oriented than other breeds or varieties. As a consequence, the placement and size of the nose and the frontal vision is the reason for the characteristic head configuration, with more stop in the profile view, allowing better forward vision but lesser scenting capability. For these reasons using a sight hound for any sort of scent work is usually a poor choice.

In the night the dog regains the visual advantage, and when the man retreats to sleep the night away it is often his dog which provides the night watch, especially of the flock or herd. These vastly different yet complementary sensatory adaptions and capabilities are basic to the human–canine partnership. A man and dog together can have the best of both worlds, for the man is able to see at great distance and constantly scan the horizon or distant areas, alert for an adversary or potential game animal, while his dog is there to bring his acute sense of smell to the partnership, to seek out prey animals or follow a wounded animal so that it can become a meal for everyone. The sharp canine hearing, olfactory capability and night vision become aggregate sensatory assets of the team, are in many ways the foundation of the value of the dog to mankind.

In order to benefit from the dog's olfactory prowess, it is necessary to teach him the desired behaviors according to situation and command, that is, begin tracking when the line is attached to the harness or collar or commence searching in response to the handler's demeanor and direction. Motivation is the foundation of dog training, even at the most crude level as in do what I want or I will hurt you. But correction as primary motivation is ineffective in scent work foundation training, the emphasis must be on positive motivation, must rely on the inherent instincts of the dog. As in any aspect of training, once the foundation is there, the dog understands what is to be done, then appropriate and proportionate correction may become necessary, but this generally has little to do with the work itself but rather the obedience aspects. This is much more true in sport competition where the judge will deduct style points for arbitrary behavior, such as taking a step off the track to check the odor, having nothing at all to do with success in the task or the usefulness of the dog.

In reality, you cannot teach a dog how to track or search, you do not even really know how a dog tracks; all you can do is teach him the desired procedures, to respond in specific ways and adapt particular styles. Motivation for tracking or area searching draws on the natural prey or hunting instincts, essentially adapts and redirects natural propensities. Substance detection is more difficult and subtle in that cocaine, marijuana or gun powder are in and of themselves of no interest to a dog; other reward mechanisms must be introduced.

Generally speaking practical canine scent work tends to focus either on living creatures or the detection of objects and substances. The former category encompasses all of the variations of sport and subsistence hunting as well as applications focused on human beings, such as lost persons, criminals or enemy soldiers in a military engagement. Substances and objects of interest include crime scene evidence, truffles in the woods, illicit drugs and bombs or explosives among many other things, the list being virtually endless.

Human focused scent work naturally breaks down into searching where an unknown number of persons, often disaster victims or lost persons, may or may not be present in a specific, and often quite large, area and tracking or trailing where the object is to find a specific individual starting from a known or conjectured point of presence. Although there is significant overlap, large-scale search and rescue is generally conducted by well-trained volunteer civilian groups and tracking or trailing is more often the province of police, military or other governmental personnel.

Cadaver work, searching for the remains of deceased persons, is another specialty, often taken on by civilian volunteers, sometimes in conjunction with search

and rescue operations. The variations are almost endless, including things such as searching for buried avalanche victims in a ski area. In addition to the police applications and searching for truffles mentioned above, innumerable other object and substance applications have evolved, include detecting leaks in buried natural gas pipelines. *(Johnson, 1975)*

The Scenting Process

At first impression the most remarkable aspect of the canine olfactory capability is perhaps the sensitivity, that the dog can detect scents that are remarkably old or dilute. But even more remarkable and useful is the power of discrimination, the ability to identify one odor among others that are much more fresh, intense or pungent. Not only is this important in hunting or when seeking a human being in an area where many others have been more recently present, it is also critical in drug detection, where the dog must alert on a trace of an illicit substance among much more numerous and concentrated ambient odors or the odor of substances in which drugs are hidden in order to mask their presence.

For the dog the sense of smell is a primary communication mechanism, just as important as sound or vision is for us. Scientific research has revealed the existence of pheromones, chemical and biological bodily secretions that serve as biological signal agents. *(Syrotuck, 1972)* These biological signals are thought to be primarily effective for communication within a species, such as for sexual attraction when a female is ready to breed. The distance from which the female in heat can attract the male is remarkable, a concrete demonstration of the efficacy of these pheromones. It is also thought that such chemical messenger agents may enable the dog to sense and interpret these odors in another species, perhaps allowing a dog to sense human emotional states such as fear or aggression.

Naval drug detection dog Jake with handler Blake Soller U.S. Navy photo Vance Vasquez

The primary sense of smell resides in olfactory sensor cells in the nose, which bind with particles or water born substances drawn into the nose to create nerve signals to the brain, just as the receptor cells in the back of the eyeball convert packets of light energy, photons, to nerve impulses. Syrotuck indicates that while a man normally has about five million of these olfactory sensor cells, a larger dog will have perhaps 220 million. In a similar way, the region of the brain devoted to interpreting these sensations is much larger in the dog than in man.

Although it is a slightly arbitrary distinction, the odors that a dog is able to detect are thought of as being either air borne or ground scent. By its nature the air borne scent carries with the wind or breeze and over time dissipates, eventually to the point that even a dog can no longer detect it. Even when there is no or little breeze, as in the interior of

a closed building, the scent constantly dissipates, spreads out, until it is distributed in the available airspace. If the source, such as a concealed man or illicit substance, remains present in a confined air space it continually emanates scent particles and gasses, in which case there is usually a gradient, a lessening in intensity with distance from the source. The ability to sense these infinitesimal odor intensity gradients is what enables the dog to locate quickly the source, that is, the sought person or substance.

Airborne scent can sometimes be seen in action when a dog is searching in a field or open area, where the natural tendency is to move in increasingly wide circles with the nose relatively high; when the dog makes a sudden turn directly into the breeze and goes straight to the person or concealed food it is the air borne particulate matter and evaporated substances that he is detecting and following. While discouraged in most sport tracking, this behavior is the foundation of the area searches for lost persons and the effectiveness of the military scout or patrol dog in detecting a hidden enemy as the patrol advances.

When a dog is following a ground scent he will tend to push his nose close to the ground or in the vegetation and in general proceed slowly and deliberately. The dog is of course not sensing particles or scent tightly bound to the vegetation, dirt or pavement, for if it is contained at the surface he cannot by definition smell it, for the sense of smell is dependent on drawing the airborne particles and gases into the nose. Ground scenting or tracking works because the dissolved particles or gasses are gradually being released into the air close to the ground or because in sniffing the dog is actually drawing the scent off the surface of the grass or earth. By pushing his nose into the grass the dog is gaining access to the most moist and intense scent, because the air within the grass layer is sheltered from the sun, moister and more concentrated. In the sniffing process moisture is produced when he dog exhales, thus providing moisture to lift a scent off of a surface in a dry environment.

When a dog air scents a person, he is detecting among other things particles and dead cells constantly shed from the skin or released through the breath. Substances in the persons clothing or personal hygiene products such as deodorant or perfume may also contribute to the aggregate odor. The more active the person and the warmer the air the more intense the odor becomes; and the greater the distance and age at which the dog can detect it. The shedding of cells is a fundamental part of life, estimates are that fifty million cells in the human body die every second, and one way or another eventually shed into the environment. The skin in particular is continually replacing itself, which is why a cut heals so rapidly; the average life of an individual skin cell is only about 36 hours before it is shed. (Syrotuck, 1972)

Since as the skin grows the surface layer of cells which sheds particles will generally consist of cells which are no longer living. But bacteria which are always present will continue to live and multiply, creating by-products and thus generate odor as long as there is available organic material. Moisture is necessary for this process, so sunlight can reduce odor both by drying out the raft of dead cells and by killing the bacteria directly. Also, although the odor decreases over time, and eventually disappears, an increase in moisture can for a time increase the odor present and make the tracking easier for the dog. A light rain or mist on your track might not be an entirely bad thing.

Tracking and Trailing

There are two primary modes of operation when a dog follows the path taken by a person, such as a lost child or a crime suspect, according to the source of the odor being followed.

Tracking is the process of a dog following a person by sniffing the ground footstep by footstep, with his nose constantly close to the ground, pushing into the vegetation, sensing primarily crushed vegetation or other ground disturbances rather than the actual odor emanating from the body of the subject. In general tracking is not specific to a particular person, for the dog is primarily following the ground disturbance. Some residual body odor is always present, and the dog will most likely be aware of it; following only the vegetation or surface disturbance is a trained response. But training never entirely eliminates the dog's propensity to act on his own according to age old instincts in unusual circumstances.

Trailing is the process of searching with the nose carried a little higher much of the time and sniffing the air and ground scent to detect the actual odor of the person. The trailing dog is primarily following the intensity of the person's air and ground odor, that is, the particles and gasses constantly emanated and drifting in the air or clinging to the surface. Thus the dog is seeking a specific person, which is usually identified by allowing the dog to scent an article of clothing or other personal object at the beginning of the search. In following the trail the dog may deviate significant distances from the path actually taken by the subject person, following the air current dispersed scent. The Bloodhound generally works in this mode, and is regarded by many as the quintessential trailing dog. Trailing dogs tend to move faster than the typical tracking dog, partially because the tracking dog is carefully trained to be slow and methodical. Because the trailing dog departs from the actual path of the person he is more likely to miss an object inadvertently dropped by the subject, which might be important evidence in a police application or provide useful information in the case of a search for a lost person.

But these are in many ways artificial distinctions, end points in a continuum, for the dog is always taking in a complex set of impressions from all of his senses and processing them according to instinct, training and experience to guide his search. This is a process that we cannot hope to comprehend completely because it is so foreign to our almost exclusively visual worldview. Generally formal tracking, devoid of air scenting or visual checking, results when the style is trained and enforced, that is, when the dog is compelled to adapt tracking in a particular formalized style to obtain points from a trial judge. Left to their own instincts and inclinations most dogs proceed in an ad hoc manner, occasionally or predominantly sniffing the air higher above the ground or visually scanning the surroundings.

When the dog is in a primarily tracking mode, that is, pushing his nose into the vegetation or close to the ground, the question becomes precisely what is it that he is following? Secretions from the body, lungs and clothing will not be concentrated on the track or path, but will disperse according to air currents and temperature. Some material from the soles of the followed person's shoes or boots may abrade onto the ground and then give off an odor, which is a possible factor when a person is being tracked on concrete or other artificial surfaces. But in general it is believed that what the dog is predominantly sensing is disturbances to the vegetation and soil, the damage being done by the footsteps. Whether a dog is ever entirely in tracking mode, that is, absolutely ignoring residual personal odor, is something we cannot be certain of, but if he is in this mode then the search is truly independent of the particular person, that is, the dog would not be able to identify the person.

Although the sport dog may be trained to focus on the actual footsteps, often reinforced with bits of food in unpredictable foot impressions, he has been trained to ignore the usually present residual body scent on the ground in that the tiny flakes and body odor continually emanating from the person are always falling to the ground, with the heavier particles likely falling closest to the path. Although these tend to end up slightly down wind the motion of the air of the walking person can result in some body scent slightly up wind. As discussed in detail by Syrotuck, the variation in intensity of the body odor and the odor of the disturbed vegetation can

vary independently over time and according to ground conditions, with one or the other predominating over the course of the track. (Syrotuck, 1972) This is very important in training, in that those teaching formal tracking for a trial will want to avoid track ages corresponding to the likely predominance of body odor or air scent. (Johnson, 1975)

Because of this the dog can often discriminate, that is, often pick a particular track or trail out of several or many with remarkable effectiveness, and usually select the right direction when introduced to a track from the side. This is partially according to the age of the track but probably also reflects that the dog is usually able to detect and process the body odor to some extent.

Just as in other working attributes, dogs by their nature are not equally adept at tracking. This reflects physical variation, the actual sensitivity of the olfactory organs and the structure of the nasal passages, as well as the working willingness in this venue. For this reason trial systems test the olfactory effectiveness in various ways. The Schutzhund dog follows a track twenty minutes to several hours old, always made up of straight segments with two or more right angle turns. There will be two or more articles, such as a glove or block of wood, which the dog must detect and identify to the handler. At advanced levels there will be cross tracks which the dog must ignore.

The KNPV dog must do a search for a coin or brass bullet casing tossed in the grass, which must be picked up and presented to the handler. He must also search for an object or a man, with the protective suit, in a wooded area. Upon finding the man, he must bark intensely and guard to signal the handler and the judge. The Belgian and French Ring trials have no tests of the olfactory capability of the dog, a serious limitation on their effectiveness for police work breeding selection and training.

In the judging of the Schutzhund style of track the dog must proceed systematically footstep to footstep in order to receive full points. Since this is not the natural way a dog works it is in general taught or reinforced behavior, and also behavior selected for in breeding since the higher scoring dogs are preferred. This style of tracking is generally, but not universally, created by putting food in the footstep and withholding food prior to training to make it more desirable. Sometimes tracking is taught by extending the retrieve, that is, concealing a ball or other play object in the grass and encouraging the dog to sniff further and further to find the reward.

Sometimes trainers utilize fairly heavy compulsion, that is, correct the dog when he deviates from the footstep-to-footstep style of work, sometimes using a short tracking stick attached to the collar. The dog is trained with the lead attached to the collar and then passing between the front legs so as to pull the head down as the dog pulls into the track. A very short grip on the lead can be used to restrain the dog in the beginning of the training. Dogs are in some venues, such as AKC tracking trials, generally trained utilizing a tracking harness, where the lead is attached at a point on the dog's back that allows him to pull into the lead without obstructing breathing. Schutzhund style tracking puts great emphasis on methodical tracking with a deep nose and loose lead, so the attachment point is low on the neck and the lead passes between the front legs. In this configuration, pushing forward tends to pull the nose down and slows the dog. The collar is usually a chain link collar, but attached to a dead ring so that it cannot choke the dog or restrict airflow.

According to the rules, the Schutzhund dog can work off lead in the trial, but I have never seen this being actually done. I have observed a French dog trained for independent work, where the handler steps up to the beginning of the track and sends the dog with a swing of the arm; the dog works the entire track, including turns, while the handler remains as the starting point. When the dog finds an article

at the conclusion of the track, he picks it up and returns it to the handler, still at the beginning of the track. This is a most impressive demonstration of training and tracking skills.

The problem with all of this is that it does not necessarily translate directly to real life application. In police work, the building or area search is more common than a track, in urban police work dogs seldom if ever need to track in this manner. Furthermore, our criminals are not required to shuffle their feet, go in straight lines and make right angle turns, they are going to run, to change direction, to go over fences and obstacles. In many instances the dog that works according to his natural inclinations, sometimes moving with a head up, will move faster and expend less energy. And when something unusual happens to the track he needs to search and perhaps air scent, things he is corrected for in the formal Schutzhund training. Syrotuck reports instances of dogs ignoring a body or hidden person when passing within a few feet because of such training. (Syrotuck, 1972) Dogs useful in serious police or military work need to retain the initiative to break the rules and react according to circumstances, and as a consequence the highest scoring sport dog is not necessarily the best dog by any realistic criteria.

Over the years all of these sport systems have moved incessantly from the realistic toward the formalistic; have evolved toward rote pattern training, the performance of a sequence of exercises rather than preparation for useful police work. This is especially true in the search work, tracking and/or trailing, where only the KNPV has anything remotely realistic.

In America especially this has tended to perpetuate the gulf between police procurement, training and deployment on the one hand and the increasingly stylized sport programs on the other. In the end, the ultimate question is what is the point of putting so much effort into establishing Schutzhund or other programs in America if so few dogs are bred and trained within this system for actual police procurement and deployment, if there is to be so little real interaction or mutual support between these sport and police trainers? Increasingly sport trainers and judges alike are devoid of any real comprehension of practical applications, any interest in the practicality of what they are training and testing for. This gulf between sport and police work is a primary reason for the failure of both programs to approach their full potential in America.

My initial experience in dog training took place in the later 1970s, laying tracks for my wife's young German Shepherd. This was AKC style tracking, and the dog was naturally quite good, perhaps because we did not know enough to correct it out of him, and I became more and more creative in devising means of challenging him and keeping his interest up. Although we did not understand the significance of it at the time, while the dog had been acquired from a show oriented breeder the sire was a good working line German import and the other side of the pedigree was favorable.

In training I would normally hide at the end of the track and peak out to see how it was going, but this became a problem in that the dog would occasionally take a quick look and, if he saw me, run directly to me. I gradually became quite creative, sometimes jumping as far to the side as possible – I was much younger and more agile then – and then heading off at an acute angle. The more difficult you made the track, the greater the intensity of this dog became. It was a real learning experience; I think the dog taught us a lot more than we taught him.

Throwing a ball or Kong for a dog is a source of never ending fun, but also the opportunity to observe how the canine sensory capabilities – scent, vision and auditory – come into play. When I throw a ball or Kong for my dogs they will retrieve it by sight as long as it is in motion, but if it comes to rest before they locate it they will use their nose to search for it, even though it is in plain sight for me, at a much greater distance.

As an example, I am in the habit of playing a game with my dogs, primarily at this moment a male and his mother. We are fortunate enough to have several fenced acres, with a lot of shrubbery, garden areas and some patches of longer grass or weeds. The game is fairly simple, we have a number of Kongs with an 18-inch line and a knot on the end, which can be swung underhand to produce a high arc and a hang time that would be the envy of a football punter,[1] which can be placed with some accuracy. When the Kong is thrown so that the flight is in view the dogs can clearly follow the motion and are generally near when it finally comes down, after several seconds in the air, illustrating how keen their perception of moving objects is. (They are also very sensitive to the sound when the Kong strikes the ground, and often able to go directly to it on this basis alone.)

To begin the game, I will place the dogs down, or select a moment when they are distracted, so that I can throw the Kong outside of their field of view. Often the Kong winds up in the grass, clearly visible to me because of a bright orange ribbon, but at other times I purposely throw it into an area where it will be concealed, sometimes hanging up in a tree or bush. I often try to trick the dogs by putting the Kong in an out of the way or concealed spot. (Swinging your arm pretending to throw the object is considered very bad sportsmanship, and the bitch particularly will get in my face and bark intensely.) Often the Kong placement is perfectly obvious to me because of my upright stance. The dogs will dash out and begin circling, in a seemingly random pattern rather than a formal grid search as a human being might use. Often they pass very close to the object, close enough that you would expect it to be in plain view, but continue on. Typically this continues, with the nose down until one or the other stops abruptly a few feet away, and then raises their nose slightly and goes directly to the object.

This illustrates the natural search and scenting process, and gives real insight. I am not entirely certain, but my impression is that it takes time for the odor to disperse and drift, so that part of the delay is because the initial odor is very close to the object; as the dogs are circling the odor cone is spreading. Although the search pattern at first seems random, if you pay close attention there is a general center of attention where the dog expects to find the object. The overall pattern is one of repeatedly circling at an ever-expanding distance. Since we have areas separated by fences with open gates, the dogs will eventually go into the adjacent fenced off sections to search. Also, if the initial search does not turn up the Kong, they will eventually go to previous hiding places, or start to look up into the trees to see if it has hung up. This is a lot of fun, and provides a real opportunity to see how the dogs solve the problem in the most natural way without any influence of training or a human conception of the "correct" approach.

The general problem with sport training exercises can be that in tracking it is the track and the style in which it is worked that matter, but in practical service it is often what is at the end of the track that is important. It is common practice to place a bowl of food or an object such as a tug or Kong at the end of the track, but many dogs will, after a couple of tracks, want to dispense with the footstep by footstep approach and go into search mode, that is, make big circles until down wind and then go directly to the desired reward, which is the natural and often best thing to do. Thus much of the training is teaching the dog not to use his natural and most effective search tactics.

In the early years of the twentieth century, as the formal police dog was coming into use, there was a great deal of enthusiasm for the detector dog, the dog which could solve crimes by use of his olfactory prowess. Although the enormous potential

[1] American Football, where a punt is a hand held kicked ball.

for applying canine olfactory acuity to police work was there, as in many new ventures there was the tendency for the enthusiasm to create unrealistic claims and expectations, things that experience has proven to be outlandish today. It was for instance widely believed that the dog seeking a person was always following the odor of that person and thus always capable of distinguishing the track of an individual person from others that might be present.

Beginning in 1913 and continuing after the war Konrad Most in Germany produced overwhelming evidence that this is not in general true. (Kaldenbach, 1998) One of his demonstrations was to have two track laying persons start from a distance and walk directly toward each other. Upon meeting, each would make a right angle turn, so that they walked directly away from each other. The general belief in the era was that a tracking dog following one of the tracks would, at the meeting point, make a right angle turn to follow the track of the person he had been following. Most demonstrated that when trained tracking dogs were actually put on such tracks, they almost always proceeded straight on at the turn, shifting to follow the track of the other person, thus demonstrating that it was the track, the damage to the vegetation, rather than the person that they were following.

Colonel Most did extensive research with hundreds of repetitions. In order to further demonstrate the nature of the tracking process, he constructed tracking wheels with wood or porcelain protrusions, artificial shoes, to create tracks absolutely devoid of human presence, which the dogs tracked perfectly well. He did experiments where a track was laid by a person who was literally lifted away from the ground by a cable arrangement at a certain point, with the tracking wheel going on from there. The dogs reliably followed the track with no problems at the transition, conclusive evidence that it is fundamentally the ground disturbance that the dog is working, or at least that he has no difficulty continuing on when the body scent becomes absent. This is further verified by the fact that most trainers lay the vast majority of training tracks for themselves, for reasons of convenience and availability, and there is no particular problem when the dog goes to his trial and another person lays the track.

None of this should be construed to mean that dogs can not follow an individual person, even in the presence of tracks or trails of many other people, but rather should be understood to mean that a dog tracks or trails according to his training and his nature, and that when trained specifically to track it is the ground disturbance rather than the odor of the person that is being followed.

Dogs trained differently can and do follow specific persons, as in the trailing dogs which by propensity and training are allowed and encouraged to sniff higher off the ground and focus on the man scent. Furthermore scientific investigations demonstrate and quantify the fact that odor can pass through substances such as the leather soles of boots and even through rubber boots.[2] These investigations verified the plausible expectation that the longer the person wears the boots, that is the more vigorous exercise and the hotter the temperature, the more the feet sweat, the greater the odor. This indicates that the personal odor emanating from an old, well-worn pair of boots can be expected to be greater than new boots. To what extent this is detectable by a dog in specific situations is difficult to know, but the fact that dogs trained almost entirely on training tracks laid by the handler do well in a trial with a different track layer do just as well would indicate either that the odor coming from the boot is insignificant or that the dog has become trained to ignore it. This research also has important implications for the detection of illicit drugs which have been packaged in supposedly impermeable packing material.

[2] Research of Dr. W. Neuhaus as reported by Haak and Gerritsen. (Gerritsen & Haak, 2001)

The factors effecting odor sensing acuity under diverse and not always well understood circumstances, and the extreme sensitivity of the dog to handler cueing, inadvertent or malicious, demonstrates that in honest criminal prosecution canine olfactory evidence can only help find a suspect and provide supporting evidence; should not be enough to produce a conviction as sole incriminating evidence.

For training, the sensitivity of the dog's nose can be a problem in that it is difficult for the handler to tell if he has left the track to follow a rabbit or if the track actually does take a turn, and nothing can set back the training more than the handler correcting a dog because he cannot perceive what is perfectly obvious to the dog. As Tom Rose once commented, training a dog to track is sometimes a matter of following him around until he teaches himself to track.

Today most Schutzhund or IPO tracking is trained by use of food on the ground, sometimes starting with small pieces in an area and more often put in each foot impression in a short track. There is great emphasis on the deep nose, the dog going footprint to footprint.

Historically the older books often describe tracking training as an extension of the object retrieve, with the object being thrown and further out, and eventually being placed at the end of a track when the dog is out of sight. The older Belgian Bouvier trainers I have talked to have usually described this sort of approach; the extensive use of food seems to be a relatively recent innovation. In general the older training books, such as Konrad Most, mention food only in the context of teaching the food refusal.

Search and Patrol Work

In many applications such as broad area wilderness searches, disaster scene recovery and military patrol the objective is the detection of any person present rather than seeking a specific, known subject. In such applications the reliable negative result, that is knowing that an avalanche scene is clear or the area into which the canine led military patrol is advancing are free of human beings, is extremely important. In such situations a false negative, failing to detect a snow covered person or enemy sniper, is likely to have serious and perhaps tragic consequences.

In such situations there is no specific starting point as in tracking or trailing. Thus the handler must broadly direct the search or detection operation, as in a search for a lost person where some sort of search grid must be established or a military patrol where the focus of the dog is directed toward the direction of expected travel, with the dog on the alert for a potential concealed enemy. In these search and patrol applications it is the airborne scent that is the primary detection mechanism, although scent close to the ground can be important to the search process. In these situations the senses of sight and hearing also play a role in the detection process, especially in the dark.

In the case of the military patrol dog ground scenting is generally discouraged, because it takes the attention away from the air scent which is the primary mechanism of enemy detection and alert; a civilian search dog can ground scent because while time is important a few moments or even minutes with the nose down is not likely to be of great consequence. But for the military scout dog time is of the essence, even a few moments of delay in giving a warning can be fatal. Because of this, it is important that the military patrol dog handler be aware of wind and air currents, as air moving with the direction of travel will carry away the odor of a potential adversary, greatly increasing vulnerability. The hunter must also be continually aware of airflow and direction for similar reasons. In training the tracking dog, airflow from behind carries the human body odor away from the dog's nose,

thus making the ground scent in the actual footsteps more predominant. For this reason initial tracks for the novice dog are often laid with the wind or breeze at the track layer's back, because otherwise the odor of food in further out steps would tend to drift toward the dog's nose, tempting him to go directly to the food rather than pushing his nose into the intervening footsteps.

Wilderness or disaster search operations are often conducted by organized civilian volunteers. Search and rescue, as the service is generally known, typically involves numerous people and dogs systematically seeking out an unknown number of persons, perhaps injured or dead. Persons lost in a wilderness area or in the aftermath of a natural or man created disaster, such as an earthquake, are typical situations. Perhaps the most evocative instance for Americans is the rescue efforts in the aftermath of the September 11 attack in New York. Search and Rescue operations often involve trailing in addition to broad area searching, that is, starting from a known or conjectured point of presence and attempting to follow the path of a specific search subject.

Civilian search and rescue groups typically utilize diverse breeds and individual dogs, which are generally much less inherently aggressive than the normal police patrol or tracking dog. Search and rescue dogs for wilderness area work generally tend to the 50 to 90 pound range, as smaller dogs have difficulty pushing through the vegetation and covering the terrain, and larger dogs are more difficult to transport and unless extremely fit subject to fatigue. Disaster situations such as earthquakes and building searches in the aftermath of an explosion favor smaller, more agile dogs.

Homeland Security search dogs - 2011

Labrador Retriever	148
German Shepherd	26
Border Collie	22
Golden Retriever	21
Malinois	19
Mixed breed	9

To provide a general idea of the breeds in use, the 2011 U.S. Department of Homeland Security roster of Urban Search and Rescue Certified Disaster Canine Search Teams included 251 dogs as listed in the table. There were no other breeds with more than 2 representatives. These dogs would be for diverse applications such as earthquake recovery, building explosion, hurricane and other similar disasters where the rubble would put a premium on agility, caution and reliable response to handler direction. It would certainly be interesting to know the backgrounds in more detail, that is the percentages of the Retrievers from real hunting lines and the traditional police breeds from working lines.

In training and selection it must generally be assumed that the objects of the search are likely to be injured, sick or incapacitated by exposure to the elements, often children or similarly vulnerable persons. Since the search subjects are typically in a severely stressed emotional state it is very important that the dogs are not only under reliable control, but that their natural reaction when encountering a person is overtly friendly rather than threatening.

In wooded or natural areas, fear and panic are often the real problem; on one occasion many years ago I can recall walking in the woods, preoccupied with the vegetation and scenery and, upon looking up realizing that I had no idea where I had wondered to, every direction looked the same. By just standing still for a moment I was able to hear voices off in the distance and became reoriented, but even relatively experienced people can be subject to panic and fear. But in general those out and about in forest or wilderness terrain today often have cell phones and GPS location units, which if used with moderate care head off many lost person scenarios. Thus as a generality, the object of search and rescue operations is increasingly tending to be elderly persons, sometimes with dementia, and smaller children, sometimes with some form of autism or other mental affliction. Sometimes such

people are frightened or do not want to be found, which can be a serious problem because if they are passed over in a grid search another pass may be greatly delayed. If the search subject is mobile he may purposely move into an already searched area, which means that a completely covered grid may not actually encounter the person. In such situations the best hope of success is in a dog detecting and indicating a track, and the handler being alert enough to detect this and encourage the dog.

Searches over large rural or wilderness areas tend to incorporate other resources such as systematic horseback and all-terrain vehicle patrols. Canine searches are mapped out and scheduled to avoid overlap with other dogs and provide complete, systematic coverage. In general the dogs work off lead in order to quickly range over larger areas than a handler could possibly keep up with, and to avoid entangling any sort of lead. When the dog makes a find, he may be trained to bark continually to lead the handler to the scene. Alternatively the dog may be trained to return to the handler and indicate, perhaps by jumping up, then on command leads him back to the found person. Often the dog and handler are accompanied by other search team members to handle the radio and other logistical matters so that the handler can focus on directing and reading his dog, which requires that he be aware of terrain and wind currents so as to provide maximum coverage and not leave areas unchecked because the search never passes downwind of a lost person. Search style and range vary according to the training and propensities of the dog, with some being wide ranging and out of sight for minutes at a time and others remaining closer and under more handler direction. A dog will typically detect an airborne odor of the subject and make a turn to approach him directly, following the airborne odor to the source. If the dog is in sight, the experienced handler is likely to become aware of the imminent find by the demeanor and behavior of his dog.

Although mostly volunteer the work of the search and rescue canine handler is demanding, requiring maintenance of good physical fitness for the person as well as the dog. Wilderness or rough area skills such as working with a compass and a comprehensive knowledge of survival skills are essential; the search team must come prepared with terrain and weather appropriate clothing, water for the dog as needed and appropriate footwear. No search and rescue director needs a team member becoming lost or injured themselves and becoming a consumer of search resources rather than part of the solution.

These search and rescue volunteers sacrifice an enormous amount of time, effort and uncompensated personal expense. Training is time consuming and often must be done away from home in order to have access to appropriate terrain, and deployment can involve traveling great distances on very short notice, sometimes only to be held in reserve and ultimately be released to go home without actually being deployed. Days away from home – traveling, waiting and routine searching – are much more common experiences than the occasional dramatic find or a brief moment of attention in the national press.

Substance and Object Detection

Historically canine search functions, especially involving the military or police, focused on seeking out persons, such as those lost or suspected of criminal activity. This did not involve especially novel training methods, but was rather a natural transition of the genetic hunting or herding behaviors to seeking out persons rather than game or domestic animals. More recently dogs have become enormously useful for detecting the presence of substances such as illicit drugs, explosives or fire accelerants. This detection capability has proven effective at finding objects, such as evidence in a police investigation, in a wide variety of environments such as open fields, forests or virtually any sort of crime or incident scene. Dogs have come to be

commonly used at national entry points such as airports to detect the presence of illicit agricultural products, the introduction of which could carry disease and pests capable of devastating entire agricultural enterprises, thus doing serious economic and social damage. The canine substance and object detection potential is almost limitless, with novel applications such as disease detection or natural gas line leaks continually being explored.

Although the canine substance detection potential was well known in principle, the widespread utilization of drug and explosive detection dogs has taken on enormous importance in recent years, roughly since the Vietnam war era, in response to urgent law enforcement and military needs. Although there were WW II era attempts,[3] generally unsuccessful, to develop mine detection dogs more sophisticated approaches have gone on to make such applications practical in recent years. The essential problem was that substances such as drugs and explosives have no natural, inherent attraction for the dog, rendering compulsion as the fundamental training mechanism ineffective and counterproductive.

Young German Shepherd training the passive drug indication.

The traditional police and military aggression based applications, that is guard or patrol work, had inherent rewards in that the motivation, the fighting drive, came from within the dog; there is no need to reward a good dog for engaging the decoy with food or a thrown ball. Since drugs or explosives are of no interest, it is necessary to provide a reward, generally food or objects such as a balls or Kongs. As late as the Vietnam era food was the primary reward introduced in the U.S. military training documents, but in recent years the use of toys or objects has become widespread but not exclusive.

Today, as a generality, military programs involving the traditional Shepherds and Malinois, because of the intense prey drive, tend to focus on a tennis ball or Kong as a reward, while the more civilian oriented specialist dogs such as the Labrador Retriever tend to be trained using food as a primary reward. These are not hard and fast rules, for many Labrador Retrievers and similar breeds serve admirably in the military and non-military government agencies also have diverse programs and methods.

In recent years drug detection has become arguably the most important and cost justifying aspect of police canine service. While the basic training with a high potential dog is straightforward, legal requirements to minimize damage to citizen property and insure a legitimate indication, rather than a response to a subtle handler cue, renders training more complex and time consuming in that the drug dog needs to do minimal damage to a vehicle or premises, which may in fact be entirely free of drugs. The dog is usually motivated by the search for a tennis ball or other play object, and the very intense and driven dogs selected for this work will by nature be inclined to become excited in the presence of the ball, or the drugs which produce the expectation of the ball, as a reward. The dog will tend to scratch and dig when he senses the presence of the desired object or substance, which can do significant damage to a vehicle or building premises, or even a person in possession of the drugs. This scratching and digging at the drug or hiding place is referred to as

[3] Details in the war dog chapter.

an aggressive alert and is generally easier to train because it is the natural reaction of the dog.

An increasing number of trainers prefer the passive alert where the drug dog indicates by going into a sit position and staring intensely where the drugs are hidden, rather than digging at the site with his paws or becoming unruly. This is generally regarded as more demanding in training and discipline. The passive alert is helpful in avoiding inappropriate property damage and to provide the clear indication of a find legally helpful in successful prosecution. This demands a great deal of restraint on the part of the dog, that is requires a response directly contrary to his highly driven nature and intensity.

A good comparison is the pointing style of bird dog used in upland game hunting. The dog searches on ahead, using his nose to detect the presence of the pheasant or other game birds and then snapping into the classic, one foot in the air pointing posture. The dog is instantly aligned on the position of the bird and provides a positive, unmistakable indication, allowing the hunter to step up to a safe position with a clear shot before the bird is flushed. Similar stylized indications are very desirable in the drug dog and especially the explosives detecting dog.

Professional trainers and handlers debate the merits of these approaches, and like most things there are shades of grey; it is one thing to paw or nose the found object and another to aggressively dig and, unless the handler can restrain the dog in a timely manner, do significant damage to property or evidence. Every type of work and individual dog presents a new situation which must be evaluated on its own merits, and some individual trainers or institutions continue to prefer the active or aggressive indication. The one absolute principle is that bomb and explosive dogs must always make a passive indication, and the dog that cannot be reliably trained to do so should to be eliminated from the training program.

Although sniffing around a vehicle or a quick tour of a building may seem like a walk in the park, real life drug detection work is arduous and physically demanding. The ideal dog tends to be high in energy, play object driven, agile, wiry and medium to smaller in size.[4] Agility and medium size allow the dog to search more easily in restricted spaces such as a vehicle, the interior of a cargo plane or a warehouse with higher shelves. The coat needs to be adapted to the predominant search weather and climate, and while naturally rough or longer coats, which can be routinely maintainable, are fine the elaborately groomed profuse coat fashionable in the show lines of some breeds are counterproductive. High object or play drive is essential. Many young dogs are willing to play fetch, but the drug dog candidate must maintain intensely as he matures, gets older and when it is hot or at the end of a long hard day.

In police service, simply finding the drugs is not enough. The handler and prosecuting attorney must be able to convince the court that the dog did indeed find the contraband on his own, rather than in response to handler prompting, either maliciously or inadvertently. These legal niceties might perhaps be slightly flexible in the instance of lower level drug sellers, but higher level offenders have access to entire teams of attorneys and supposed canine experts, sometimes former police canine trainers or handlers, who make a living convincing judges and juries that the dog may have been subtly cued by the handler in order to provide probable cause for an otherwise illicit search, or routinely produced so many false indications that any indication by that particular dog and trainer are unworthy as evidence or cause for a legitimate, legal search. Detailed training records, indicating false positives as well as

[4] If this sounds a whole lot like a Malinois, the rapidly increasing popularity of this breed sort of snaps into focus.

failures, are the key legal requirements in order to sustain the validity of the search and thus obtain a conviction. Many people in the field believe that certification, where an outside agency tests the dog and handler to provide convincing evidence that the dog can indeed accurately detect and indicate the presence of contraband, should become a universal practice.

A complicating factor in drug traffic suppression is that there are a number of illicit substances to be detected, including marijuana, cocaine, opium, heroin and methamphetamines. Effective dual purpose patrol dogs or specialist drug dogs must be able to work with most of these substances, which is not a difficult problem in training in that once the dog grasps the concept of an expected reward for finding one drug, others can be introduced in combination so the dog quickly associates the new odor with the expectation of his reward.

Another very important aspect of this training is to make sure that the dog is responding only to the actual narcotic substance, rather than associated objects and substances such as plastic bags, filler material used to cut the drugs or the scent of the person placing the sample to be found.

As noted, training dogs capable of searching for multiple substances is relatively straightforward and routine, and adding a new substance is simply a matter of incorporating it among the samples used in search. But training a dog that a formerly forbidden substance is to be "taken off the list," that is, ignored, is much more problematic. Until recently this was not particularly an issue, but individual states are today taking much more lenient attitudes toward marijuana, some states completely legalizing it. In the United States marijuana use is still against federal law at this writing, and how all of this is going to play out is difficult to foresee. If tolerance becomes widespread then there will no doubt be a series of court decisions on the new legalities of search, with the possible conclusion being that an indication on a legal substance as a basis for further search violates civil rights. If this were to become a strict interpretation of the new legal environment, an enormous number of dogs would need to be retrained or retired, a huge expense and a major setback in the effort to suppress drugs such as methamphetamines which would still be illegal.

It is generally preferable for the dog to perceive the object coming from the found substance, a primary reward, rather than from the handler, referred to as a secondary reward. One way in which this is done is by constructing a wall with a series of openings in which drugs may be stashed. Above each opening is a passageway with a tennis ball or other reward object, which the handler can release at a distance by means of fine line, such as fishing line, so that the reward ball drops down into the opening for the dog, with the dog perceiving the reward as associated with the drugs rather than the handler. The training room may have forty or more lines going back to a central location, each with a numbered tag on the end to indicate which reward is to be released.

Although they tend to be much more expensive, there are also radio-controlled devices that can remotely release a ball at the site of the drug find. In the training I watch, there seems to be a balance between such primary rewards and secondary rewards where the handler throws or bounces the ball and gives verbal praise after a correct passive alert, that is, a few moments after the dog is sitting still and intensely focused on the hidden drugs.

Normally the alert posture, the taking of the passive sit or down position, is a formality. In the words of Richard Dickson, well known police trainer:

> "The true indication of the presence of drug or target odor is not the actual scratch or sit, since that is the trained behavior, but the body language that takes place prior to that action. I always say that the scratch or sit is just for the tourists.

> "A false indication is not the fault of the dog, it's the fault of the handler. A dog's body language will not lie but the dog can incorrectly illicit a reaction from the handler. If a dog gives the alert reaction (sit or scratch), without the proper body language prior to the alert it should not be rewarded or recognized as an indication. The indication must be made as obedience to the odor. A well trained handler should be able to recognize the specific odor that his dog indicates and whether it is actual or residual. Most handlers are never trained to this level however." [5]

Although there are so-called pseudo narcotics intended to approximate or emulate the odor of actual drugs for training, most trainers prefer the use of actual drugs. This requires a DEA[6] license and very close monitoring and surprise inspections to insure that the practice drugs are not being sampled for personal use or sold. Licensed trainers tend to be very scrupulous in maintaining control over their sample drugs, as their livelihood depends on maintaining their license to possess and use the drugs in their training.

Packaging and hiding marijuana or other substances is a constant game of cat and mouse between law enforcement and the drug distributors. The ace in the hole for the cops is the enormous canine capacity to detect extremely minute airborne quantities of the illicit substance in the presence of heavy concentrations of other substances, both normally present and introduced into the packaging to cover the drug odor. Drug traffickers are continually attempting to mask the odor of the marijuana or other illicit substances, but even when it is enclosed with outer layers of coffee, pepper, foodstuffs or other substances a good dog can usually make the find. The molecules of the illicit substance are continually evaporating or separating into the air from the illicit substance and once airborne continue to diffuse through the available air space. Almost all packing materials, and the vast majority available to the criminal, allow a continual, small quantity of airborne substances to escape from the packaging, either through cracks and seals or directly through permeable bags or containers. Police trainers and handlers are extremely reluctant to discuss details of effective drug concealment and packaging, for the obvious reasons.

When a drug package is removed from a vehicle, the interior of a building or the clothing of a person, residual odor lingers for a significant amount of time, because it has already evaporated or emanated from the substance and is thus present in the ambient air and on the surfaces. Also, small bits or flakes, not visibly apparent, may have broken off and still be present. If marijuana has been used in a residence or vehicle, the process of removing it from the bag, rolling it in paper or a pipe and disposing of the remains can be quite messy and leave a lot of material on the scene.

This is a serious practical, training and legal problem. If the drug dog makes an indication in the presence of residual odor, should it be considered faulty? If not, then there is no real requirement for good training and accuracy, for every false positive indication can be explained away as "residual odor." Not only are false indications a serious annoyance for the person whose vehicle or premises have been searched, it is a violation of his constitutional right to freedom from arbitrary search. This is a very difficult problem in terms of training, deployment tactics and legality, a history of false indications is a primary reason put forth by defense attorneys to obtain a dismissal.

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[5] Richard Dickson, by private communication.
[6] Drug Enforcement Administration

Drug or explosive detection training often takes place on the premises of a professional dog training establishment, usually involving patrol dogs as well as substance detection dogs. Typically such facilities cover several acres in order to provide both indoor and outdoor training, with fields for protection training, obstacle courses and related facilities. These usually include elaborate indoor areas with rooms containing furniture appropriate to a bedroom or kitchen and metal lockers along a wall to provide more realistic training. A training wall with approximately 30 or 40 openings, each capable of releasing a ball as a reward from a remote location, is usual. This is a description of the facility I am most familiar with in northern Illinois, judging from photographs in the various magazines and web sites, operations in more favorable climate tend to have more outside training.

A number of older cars and trucks are often provided for teaching a vehicle search, no one wanting to use their own vehicle with the possibility of having the interior torn up by an enthusiastic dog; the passive alert may be the end point of the training, but there are inevitable lapses in control and restraint in the training process. There are often kennel facilities, as these professional operations usually are in the business of importing, breeding, training and selling service dogs.

The Bloodhound

Bloodhound

The hound, the dog which evolved for the hunt, is an ancient type, extending back to the origins of the human and canine partnership. There are numerous breeds and varieties with diverse roles according to the style of the hunt and the nature of the quarry. Sometimes the hound participates in the kill, but at other times leaves it to other sorts of dog in the pack or the hunter himself. Hounds often pursue their quarry, such as a raccoon or mountain lion, until it goes to ground or takes to the trees. Foxhounds generally pursue until the fox seeks shelter in a den or other hiding place. Coonhounds were specifically bred in the American south to run in packs, actively baying so the hunters could follow their progress according to the tone and intensity of the baying and tell when the raccoon had been treed.

Hounds are broadly divided into the sight hounds such the Irish or Russian wolfhounds or the racing Greyhounds and the scent hounds such as the Coonhound, Foxhounds and Bloodhounds. Other than their common chase hunting function, which requires tenacity and endurance, these two classifications have little in common. Sight hounds tend to be larger for longer stride, more lightly built, with a decided stop to the scull shape to provide better binocular vision and relatively low levels of olfactory acuity. The scent hounds tend to be more massive with pendulant ears and a more plodding gait, and have been bred over centuries for the greatest possible olfactory acuity, their defining feature. A few breeds such as the Rhodesian Ridgeback are considered to be intermediate types.

Prior to the advent of firearms, the terms hound and hunting dog were more or less synonymous. In more recent times the hunter equipped with a shotgun or rifle, especially the bird hunter, generally makes the kill himself, relegating to the dog the task of locating and indicating the prey or retrieving downed birds. Thus pointers and retrievers emerged as new breeds, the gun dogs. Hunting dogs, both hounds and the gun dogs, have historically been the province of the rich and higher classes, which employed gamekeepers to persecute the working man or tenant farmer with the audacity to hunt for the purpose of putting food on the table. Historically hunting was sport for the noble or rich, and poaching for those of the working or peasant class.

Although the concept of the formal breed, with the rigidly closed gene pool, is a modern creation, over the centuries individual patrons or communities evolved uniform types for particular hunting traditions such as packs of foxhounds. In general there was a great deal of regional variation, and bringing in outside breeding stock was common in the pursuit of superior performance.

The Bloodhound evolved early in the Middle Ages from relatively large deer and boar hunting hounds as a specialist man-trailing dog. In this era the "Chien de Saint-Hubert" or "Dog of Saint Hubert" was first bred in Belgium by the monks of the Saint-Hubert Monastery, from ancient stock, and became emblematic of Belgian canine affairs. Since St. Hubert is the patron saint of the hunter the Belgian national canine organization became the *Societe Royale Saint-Hubert* and the St. Hubert hound is incorporated into its emblem. The modern Bloodhound is the direct decedent of these dogs, and when the original St. Hubert lines died out in the nineteenth century the breed was later reconstructed from Bloodhound breeding stock.

Although many tend to think of the Bloodhound in terms of a pack of savage dogs in full cry chasing down an escaped slave, prisoner or fleeing criminal, as portrayed in the movies, the reality is quite different. It is certainly true that such packs of dogs were once common, and a few remain, but they were generally different sorts of dogs, often Bloodhounds crossed with Mastiff style dogs or other much more aggressive hound varieties. Often packs were made up of different types, some primarily for the chase, others for the attack at the end of the trail.

The typical police or search Bloodhound today works as a single on lead dog, which is generally relatively docile and friendly, although there are exceptions. Even the most staunch Bloodhound enthusiasts describe the breed as gentle and inquisitive, but not especially intelligent. Lack of intelligence is in my mind something of a misnomer, the breed has been created to be single minded and obsessed with the trail to the exclusion of all other things. Attempts to train other behavior run against this grain and frustrates the misguided trainer, which is more the result of misapplication and misunderstanding of the nature of this particular beast; the dog simply wants to get on with his track. Generally the breed is subject to genetic defects and very short lived, often expiring at about eight years old.

The Bloodhound, like other working breeds, has degenerated into show and working lines. Show lines tend to be lethargic, emphasizing size and wrinkles, with 100 pounds being fairly typical and much larger dogs not unusual. Some working trainers tend to prefer more mobile and agile dogs in the seventy to eighty pound range, which are likely to hold up better over longer distances and be more mobile in rough country, where sometimes the dog needs to be helped up a rough section or over a fence. Other equally well regarded authorities indicate a preference for larger dogs. Show breeders tend to emphasize the gentle giant persona, with some substance, but reports of nasty Bloodhounds circulate, as with any breed. Formal obedience competition is not their forte, and many individual dogs take serious convincing that one must not follow the crossing deer or other animal track. Some individuals, as in any breed, seem to have a propensity for dog aggression, which many handlers seem to be able to deal with if the dog is good in his work. In the words of Jerry Nichols, noted breed authority and a retired police Bloodhound handler with many years of experience:

> "The Bloodhound today is primarily used by law enforcement and Search and Rescue. A Bloodhound can be a large and very powerful dog. Some can reach 150 pounds while the average is around 110-120 lbs. We have always trained handlers to work with these dogs on a long lead. The Bloodhound is a hunting breed and once it is given the scent to follow, it can be relentless running a man to ground even if it kills them. The lead keeps the dog from getting to far ahead and allows the handler to keep control of the dog. When they are on a trail these dogs can tune out what is going on around them to the point they could run right into traffic unaware of the dangers. I am aware of only a few prisons in the south that may still run their Bloodhounds off lead followed on horseback after escapees. For Law Enforcement and SAR, it is typically one dog and one handler."[7]

Bloodhounds, and to a lesser extent other breeds, are able to work in difficult or unusual circumstances, such after rainfall or snow, and can persist over asphalt and

[7] Jerry Nichols, personal communication.

other hard surface segments. Often this is in areas where there has been extensive human activity; the ability to sort out the one person's odor is perhaps the most remarkable aspect of these dogs. They can easily follow a child when picked up and carried by an adult, and persons using a bicycle. They are able to detect scent hovering over a body of water and search downstream to pick up the odor.

There is an enormous amount of Bloodhound lore out there, and a little bit of mythology, making it difficult to cite realistic operational expectations, what a good well trained Bloodhound in typical service can be expected to be able to do, that is how old a trail the dog can effectively follow over useful distances. Such things are like war and fishing stories, tend to get better as they are told, and as the storyteller feels compelled to match the exploits of other storytellers. Reviewing what has been written, my general perception is that about a week is an extreme outside limit under ideal circumstances and conditions. This means that a few exceptional, expertly trained and handled dogs can under favorable circumstances work favorable trails that are a week old or even somewhat older. (Schettler) These are experts with well trained dogs talking about once or twice in an active lifetime of experience, not routine expectations. More realistically 48 to 72 hours, under favorable circumstances, is beginning to push what a good dog can be expected work on a routine basis, anything beyond that being more or less a bonus.

Even when entirely enclosed, the forced air ventilation system in a modern car or truck continually expels passenger compartment air with the scent rafts and other components of odor, which means in principle that a dog can follow a vehicle with a party of interest. There are of course severe limitations, the person who is able to drive many miles at highway speeds is almost certainly beyond any dog's capability, but in instances of lower speed, shorter delay time and shorter distance it is sometimes possible; there are reliable reports of criminals under favorable circumstances being located and convicted after such a search.(Stockton, 2004) In rural areas one strategy is to traverse a highway by vehicle, stopping at each intersection to have the dog sniff and indicate direction.

How practical is all of this? Bloodhounds are indeed sometimes capable of following a person in a vehicle, but many authorities, including a well-known author, portray this as of marginal utility, say that is simply not practical in the real world. On the other hand there are well documented instances of police handlers that have been able to indicate the path of a vehicle with an abducted person, or the body, for a number of miles on a limited access highway, identifying the correct exit and leading to the find. Much of this was video recorded by television reporters.

Not every Bloodhound is an excellent working candidate; just as in any other line of work breeding must proceed according to selection for proven excellence on the track. For police work, or any other specialty, a good dog is a good dog, and a not good dog is just a waste of time. The Bloodhound is the ultimate specialist, created and maintained for man trailing, that is seeking out a specific person from a known point of presence, usually in modern police or search work as a single dog on a harness and line. The Bloodhound is not used for man aggression, building searches, or substance detection; these things are left to the patrol dogs such as the Malinois. While capable of wilderness area search and rescue the Bloodhound, because of size, bulk and working style, is not as well adapted to disaster scenes resulting from terrorist bombings, earthquakes and similar disasters.

Many police searches are handled by an available patrol dog, a Malinois or Shepherd, because he is there and because he will alert aggressively or engage when the suspect is found. When the trail is older or the available dogs are not suitable a good Bloodhound is often the dog of choice. Since the Bloodhound is not man aggressive sometimes an apprehension dog, such as a Malinois, serves as a

backup to deal with a potentially aggressive suspect. Lacking an apprehension dog, an "over watch team" can provide the cover and step in to make the apprehension.

When a person has departed from a known point a well-trained Bloodhound is often the dog of choice, but it is not automatic. Just as the bite and aggression must come from within a Malinois, but is only useful when the response is encouraged and controlled through discipline and training, a Bloodhound must not only have good working selection in the breeding, he must be schooled and trained to know that he cannot go back to the game following instincts of his ancestors and must followed the trail indicted by the handler through the personal scent item. One year of training prior to useful deployment is often cited as a reasonable expectation, just as in so many other areas of life, great Bloodhounds are born and then made through training.

In exploring the world of search and trailing one quickly comes to appreciate why the sport community generally sticks to tracking or area search exercises: for tracking you can do most of the training alone and special skills are not necessary in the decoy for the area search exercise, which involves little wait time. Trailing is different in that as the dog advances there are hours and even days of delay between laying the trail and sending the dog on his search. In this era of busy lives, finding people to send out to trail and waiting for the dog, even if they come back to the end of the trail later, is difficult.

American police agencies must work within budgets, and the primary limitation on Bloodhound deployment is creating situations where a specialized, single purpose dog can be provided enough work to justify the cost of maintenance, training and the dedicated handler; the specialist must compete for budget dollars with the multipurpose protection, search and drug detection capabilities of a Malinois or Shepherd.

Many Bloodhounds are owned and trained by individuals devoted to the breed and serve on a voluntary basis, both through civilian search and rescue groups and for police agencies. Individual police officers making available personally owned and trained Bloodhounds are not uncommon. To give a sense of how common police Bloodhounds are, it is reported that at the time of this writing there are three Bloodhounds in service in California handled by police officers and about another dozen in civilian hands regularly available for volunteer service. These are relatively small numbers when compared to the dual purpose patrol and drug dogs.

In contrast to European superiority in patrol dog breeding and training, America is on the whole the leading nation in practical Bloodhound breeding, training and deployment experience, with enterprising Americans touring Europe to run seminars, in reverse of the usual flow of working canine instruction.

Perspective

Over the years research to produce technology for artificial scent detection and discrimination has been ongoing, with periodic predictions that the technology to produce effective scent detection instrumentation would soon make drug sniffing dogs as obsolete as the horse and buggy in the age of the automobile. This may in time come to pass, but for the moment ongoing research and development only seems to push the demise of the sniffing dog further into the future; artificial scent discrimination devices with the sensitivity of the canine nose are proving very difficult to create.

In conclusion, the acute sense of smell, the marvelous olfactory capability, is among the most important factors – indeed perhaps in the modern world the most

important factor – in the usefulness of the dog to mankind. This is a general truth, applicable to the hunting and herding dogs as well as the police applications of interest

Angel's Lair All Breed **Angel's Lair Schutzhund** **Police Dog Book**