

Under ideal conditions, a track footprints) across a nice grassy field with a sufficient delay in time to allow bacteria reaction on the soil causing a good odor is probably the best type of track to have. The problem, however, is how to keep this track from being contaminated by another human beings track--particularly in the city with its large population. Don't misunderstand, it is important that your canine understand and be able to discern "vegetative scent" along with the more important human (raft) scent, but only as a back up or affirmation of the sometimes elusive raft scent you wish him to follow. As mentioned before, a true trailing canine will use both types of scent, depending upon the conditions in existence at the time. He may be following a raft scent until he comes to a roadway where he suddenly loses it. In searching for the rafts he may come upon a footstep in the grass (hopefully with a raft or two present) and thereby reaffirm the fact that he is moving in the right direction. If your canine is working very eagerly it could be very difficult to tell whether or not he is nailing down footsteps or following rafts laying on the ground. Previous test tracks may lead you to think on way or another but there will still be that certain amount of doubt. Therefore, you allow your canine to "do his thing", using both types of scent, with emphasis on the raft or human scent. A canine's natural scenting ability is more easily adapted to the vegetative scent even though the vegetative scent is somewhat stronger at a given point. He knows that there are many footprints in the grass whereas there is only one raft scent that belongs to the person (suspect) he is looking for. Given the proper training and a certain amount of time, a canine will virtually begin to discriminate on his own, thereby leading to more successful applications. A footprint in the grass with its corresponding vegetative scent is good to reassure your canine is on a track, but is not necessarily wise to encourage him to follow footprints exclusively. The reason being that you can never be sure that the person at the end of the footprint track is the same one that you started after several blocks back. City conditions would probably render most any vegetative scent (track) invalid unless you have the good fortune of tracking a culprit who has just stolen the flag on the 5th hole of a golf course at 3:00 in the morning and ran as far as the 8th hole before hiding (never leaving the grass).

Having explained vegetative scent, I feel obligated to explain a little further. Most people feel that a good deal of scent which a canine follows comes from the feet. This is not necessarily true. In the first place, the "body current" traveling up from the feet would automatically dictate that there would be more scent at the head than at the feet. Secondly, the feet are enclosed tightly in shoes thereby trapping the rafts that do escape along with perspiration. One of the reasons a person's feet smell is because of the accumulation of the trapped rafts inside the shoes. Thirdly, there are no particular glands or cells in a person's feet which are more odorous than any other part of the body. About the only thing a canine may be following that is directly relative to a person's feet is the smell of leather, shoe polish, oil or some other material generally common to more than one individual. You can see then that the best possible success in tracking would come from the canine's ability to discriminate between the person (suspect) you want and some innocent citizen who just happens to be in the area. Certainly, the use of a particular type of smell coming from a person's shoes along with his individual raft smell cannot hurt the canine, but it is not something you would want your canine to become too concerned about.

## **OLFACTORY ABILITY**

To explain how a canine is able to pick up on the rafts of an individual when there is little chance of any concentration at all, (due to winds, contamination, etc.), I will

attempt to explain a little more in detail regarding a canine olfactory system. The longer the nose the larger the room there is for all important receptor cells which all used to analyze scent. For example: (1) a Dachshund has 125 million receptor cells, (2) a Fox Terrier has 147 million receptor cells, and (3) a German Shepherd has 225 million. You can see the contrast between the smaller canine with the shorter nose and the larger German Shepherd with the long. nose. With this great number of receptor cells in a canine's nose, you can see why there is no need to have a large concentration of rafts every 30 to 50 feet and he can follow a track very successfully. Obviously the greater number of rafts, the easier the tracking will be and the less chance of confusion---particularly to a younger or "green" canine who does not have the benefit of a successful completion of a "real life" situation which would serve to confirm in his mind that what he is smelling is what he wants.

## **WIND AND ITS EFFECT ON SCENT**

In talking about the different types of scent, I have touched several times on the effect of certain items such as the wind on these scents. Obviously, you can understand that the wind would have an effect on scent much the same as it does on smoke, dust or some other lighter than air substance. In fact, one of the best ways of determining how wind will effect scent is by watching smoke as it is whisked around by the wind. Another good method (probably the best) is to close your eyes and imagine a large wall of water rushing in the same direction the wind would be blowing and picture in your mind how that water would react as it comes in contact with obstacles. What will the water do, for instance, if it were coming directly at the side of two rows of house with an alley separating the back yards? Obviously, an alleyway will serve as a sort of funnel for the water to rush down while the house will cause the water to separate and see, the path of least resistance. Perhaps the front yard is unfenced, while the back yard is not the water then will probably boil around the front much faster and easier than it can in the back until it reaches sufficient velocity to force itself over the top of the fence. Even after it flows over the top of the fence what will it do next? Chances are it will roll and eddy for a while until enough water is present to continue rolling across the yard and start all over again at the other side. While this depiction may not be exact (since water is obviously heavier than air) it is about as close as a person can come to understanding what effect wind will have on scent.

Wind will do some very strange things to the rafts your canine is attempting to follow. You may have notices in tracking (when you know exactly where the footprints are) that your canine will follow a consistent 10 to 30 feet (depending on the wind velocity) on one side of the track. What he is doing is following the rafts blown there from the person he is tracking, parallel to the original line of footprints. Another time your canine may divert a long distance up or down a road from the original line he was on. Chances are the unobstructed wind blowing up or down the road has carried the rafts a greater distance than if in between houses. Your canine is doing the right thing by following them. In order for a handler to become as smart as his canine, he must analyze the wind and at least understand what his canine is doing. Your canine may appear confused and wandering at times but before you scold him, stand back and check the wind. Close your eyes and visualize the wall of water and then if you still think your canine is working badly and not following scent go ahead and scold him.

## **CHEMICALS AND SUBSTANCES AFFECTING SCENT**

While I am sure there are some chemicals which could have a permanent effect on a canine's ability to smell, I cannot tell what they would be. Chemicals which you are most likely to come in contact with are the type which will not have a permanent effect on the canine's nose. Many chemicals and substances can deaden or "wash out" your canine's acute scenting ability temporarily, much the same as they do with a human. For example, if you will take a tube of acetone and a like tube of a like tube of xylene and try the following experiment you will see what I mean. Smell the acetone first and then the xylene, you should be able to discern or recognize each separate smell. Now, smell the acetone again. If you are normal, the acetone should now smell like xylene. The reason, of course, is that the xylene is the stronger of the two and once you have subjected your olfactory senses to it, they become temporarily washed out causing virtually everything to smell like xylene for a short while. Other substances such as gasoline, exhaust fumes, etc., can have basically the same effect. Having this in mind, you can see that your canine will be affected in much the same manner. While his scenting ability is much better than a human's, and his ability to discern scent greater, you must be aware that under certain circumstances he may not be operating at peak proficiency. This deadening of the senses is by no means permanent and will wear off as the canine is taken to a clean environment and allowed to purge himself.

An interesting study was conducted by the Germans as to the effect of pollution on a canines' ability to smell. They undertook to measure the amount of pollution from the ground up to five feet. Interestingly enough, the highest level in that zone was approximately the same height as a German Shepherd's nose. He walks around with his nose at the same level as 90% of all the exhaust pipes of vehicles on the road with a great number of pollutants. It is a wonder he is able to smell at all.

A good handler should be aware of substances inside of buildings and warehouse he may be called upon to search. It may be a good idea to list all of those buildings that have such pollutants and make a determination as to whether you wish to take the chance of even going inside with your canine. The idea of having a canine search a building because of his ability to indicate the whereabouts of a suspect, might in this instance be futile, and perhaps the job would be better done by officers.

The question has often been asked, "How much better can a canine smell than a human?" I don't think there are any black and white figures on this but scientists have placed it somewhere between 10% and 100% better. For instance, a canine could probably smell sulfuric acid 100% better than a human but a more subtle scent may bring the graph down closer to 10%. You can see then that it pretty well depends on what you are asking the canine to smell. You and I smell a suspect after we have caught him and placed him in the back of a patrol car, but there is very little chance that we would have smelled him hiding in that bush we just walked by. Make your own decision.

In any event, as a handler you should try to make yourself aware of buildings and warehouses which may have chemicals or substances in them which could affect your canine's ability to smell. Some of them you may wish to stay out of altogether, and in others you may just want to watch your canine very closely for any sign at all or indication which would normally be a strong indication if the substance, which is washing out his scent, were not present).

Likewise, you probably would like to make yourself aware of currents within a building or warehouse. Air conditioning systems, for instance, may be bringing scent down from the third floor of a department store while you are busily searching the first floor. Heating vents, cracks in the walls or ceilings and/or open windows will have much the same effect. When you enter a building, look it over carefully and try to determine which way the air currents are blowing so that you can better understand what your canine is doing when he begins to indicate. A good place to start, if you wish to make a study on how the air currents work inside a building, is to go to the Fire Department. They have made an in-depth study of air currents to help them combat fires and probably be more than happy to pass this information on to you .

There is a study done by a scientist which states that the color of a canine has a direct effect on the scenting ability. For instance, a white canine does not possess the same ability to scent as does a canine which is darker in color. That is one of the reasons you will never see a white canine in police service in foreign countries. The pigment of the canine's skin or hair has a direct effect on his ability to smell. Scent is water soluble. For the dog to be able to turn a scent raft into a solution for acceptance by his receptors, his nose must be moist. There is no reason why a canine cannot take a big drink instead. A human will very seldom replace exactly what moisture they have lost because of his ability to sweat. A canine cannot sweat and can replace exactly what moisture he has lost by drinking, so let him drink virtually all he wants.

### **Information from: Bill Syrotuk - Scent & the Scenting Dog**

Note: More advanced information on this subject during sessions instructed at the International Police K9 Conferences held annually in various locations throughout North America.