



# BEING Nosey

By Linda Tynan

Dogs have been man's companion for thousands of years, assisting with herding, hunting and providing protection for their human friends. Dogs were the first animals to take up residence with people and the only animals found in human societies all over the world. Throughout the years, they have crept their way into our homes ... and into our hearts.

Aside from the most valuable role they serve, as our companions, we are learning that our canine friends have a lot more to offer than we ever realized. The role of the dog has expanded greatly over the years from "wardogs" used by the Greeks and Romans to therapy dogs used to treat PTSD in soldiers returning from war today. Dogs now play many important roles in our society and their value to us becomes more apparent with each new talent we discover.

Cave drawings show dogs hunting with men during the stone ages. The Greeks and Romans probably were the first users of dogs in warfare, sending formations of attack dogs with spiked armor into enemy lines. The British used two types of dogs to assist in exterminating the native population of Jamestown in 1610: Bloodhounds to hunt them down and Mastiffs to grab them. In early American history, Bloodhounds continued to serve troops for tracking. In Europe during World War I, an estimated 50,000 dogs were trained as sentries, scouts, ammunition carriers, messengers and casualty dogs. By World War II, the Germans had trained nearly 200,000 war dogs. The attack on Pearl Harbor triggered the use of dogs in the United States Air Force as sentry dogs in both Europe and the Pacific, and their service in the military continues today. Dogs have not only proven to be valuable in military service, but their ability to assist us has proven to be priceless in a growing number of specialty areas.





Auburn University's VaporWake® dogs working the 2009 Presidential Inauguration. Photo courtesy of Auburn University CVM.

## Service Dogs

As the role of dogs evolved in our society, police forces recognized the value of the German Shepherd, which is now the most popular breed sworn in as K-9 officers with their own identification and police badges; many outfitted with bulletproof vests. K-9 officers sniff out drugs, search for missing children and search for missing persons during natural disasters. Specific breeds seem to be more popular for military and police work, including the German Shepherd, Dutch Shepherd and Belgian Malinois. Breeds such as the Golden Retriever, Labrador Retriever and other sporting breed dogs have been used in support of the Transportation Security Administration mission and one of the DoD's newer canine capabilities, the Specialized Search Dog, trained to detect firearms, ammunition and explosives.

What makes the dog such an incredible asset to us? Only his nose knows! It's that incredible sense of smell. The part of the dog's brain devoted to smell is 44 times larger than that of a human. An example of this would be a situation where one cc (less than a drop) of blood is diluted into 20 Olympic sized swimming pools. The dog can smell with ease that there's blood in the pool. It has been shown that dogs can not only smell 100,000 times greater than humans, but they can actually smell the vapor

trail of a scent left behind up to a distance stretching several football fields. Auburn University's own VaporWake® program has taken this one step further. The program focuses on breeding and training Labrador Retrievers to sniff out the vapor wake or trail of an explosive device as it is being carried through a crowd. This type of detection has been very successful in large pedestrian crowds. Dogs trained in this manner are used in public places like airports and the Amtrak rail system, and could potentially prevent situations like the Boston Marathon bombing.

## Medical Dogs

Another incredible use of our best friend's nose is the ability to detect disease. Medical Alert Assistance Dogs are trained to help people with life threatening health conditions. These dogs are able to detect odor changes in an individual that are associated with life-threatening conditions like acute diabetes. Some of the most common medical conditions that these dogs assist their handlers with are those that entail changes in blood sugar, changes in blood pressure, seizures, syncope (fainting), migraines and other debilitating conditions such as epilepsy.



Some skills that medical response dogs can be trained to perform include seeking out another individual when their handlers are experiencing a medical crisis, positioning their handlers in a manner that will keep them safe during a seizure, retrieving emergency medication, and even dialing 911 on phones equipped for use by service dogs.

Additionally, dogs have been trained to assist persons with psychiatric conditions such as bipolar disorder, post-traumatic stress disorder, autism, schizophrenia, and anxiety disorder. These dogs learn to recognize changes in their owner's behavior or environment that indicate paranoia, panic attacks, hallucinations, or potentially harmful repetitive actions, for example, and may remind them to take medication. The ability of these dogs to perform these tasks is based on their keen sense of smell and their innate ability to sense subtle changes in their owner's condition.

*continued on p. 20*

## What we would learn if dogs were our teachers:

1. Always run to greet loved ones when they come home.
2. Never pass the opportunity to go for a joy ride.
3. Recognize the ecstasy of fresh air and wind in your face.
4. Take naps.
5. Stretch before rising.
6. Run, romp and play daily.
7. Thrive on attention and let people touch you.
8. Avoid biting when a simple growl will do.
9. On warm days, lie on your back in the grass. On hot days, drink lots of water and find the shade.
10. When you're happy, dance around and wag your entire body.
11. Enjoy long walks.
12. Be loyal.
13. Never pretend to be something you're not.
14. If what you want is buried, dig deep until you find it.
15. And, when someone is having a bad day, be silent, sit close by and nuzzle them gently.

We'd be better off, better people . . . if we acted more like dogs.



But wait – there's more! Studies are now showing us that dogs have the ability to detect cancer. The interesting part about this is that cancer definitely has a distinct smell. Oncologists have stated that humans can actually smell cancer in latter stages through the patient's breath. The breath samples contain molecules from inside the human body. The dogs actually smell the cells, gasses, vapors, and many different volatile organic compounds that are found within the breath condensate. Cancer, or the gas that cancer may give off, is only one of the many things within the breath. These bio-detection dogs are trained on breath, blood, saliva and tissue samples from cancer patients.

At the University of Pennsylvania SVM dogs are being trained to detect ovarian cancer. Dogs appear to be able to smell a specific odor in ovarian cancer tissue samples that forms on the tissue wall. Cancer cells actually undergo processes that change the way they metabolize nutrients and this produces different byproducts. Those byproducts are then in the tissues. This is where our canine noses go to work, they can smell those cancer byproducts. Tumors exude tiny amounts of alkanes and benzene derivatives not found in healthy tissue. Special training using samples from healthy and unhealthy specimens is required to teach dogs to recognize these specific odors. The dogs are rewarded when they identify the scent. In various studies dogs have been able to detect ovarian, bladder, lung, skin and breast cancer. What's more remarkable, that once trained, studies indicate that dogs are more than 97 percent correct with their diagnoses.



### Therapy Dogs

Everyone knows that the presence of a dog lightens your mood and makes you smile. Their enthusiasm (and all the tail wagging that goes along) not only lifts your spirits, but may actually make you healthier.

While the use of pets in medical settings dates back over 150 years, it wasn't until the 1970's that researchers began to uncover the basic foundation for that bond. An early study in 1980 found that patients who had suffered heart attacks and owned pets lived longer than those who didn't. Recently, studies have been focusing on the fact that interaction with animals can increase a person's level of the hormone oxytocin, the hormone that makes us feel happy and trusting.

The hidden benefit of this is that the body is actually more able to heal and grow new cells when in this state.

There has been an increasing trend in using therapy dogs (cats, and other animals, too) to provide comfort and affection and improve the general well-being of people in hospitals, nursing homes, mental institutions, retirement homes, schools and even prisons. In addition to providing companionship, researchers are now finding that the dogs are legitimately therapeutic.

A 12-minute visit with a therapy dog has been shown to reduce blood pressure and levels of stress hormones, and ease anxiety. Therapy dogs also improve the focus and memory of patients with Alzheimer's and encourages speech and simple physical activities among stroke victims and individuals with impaired mobility. Reading programs have now been developed using dogs. Children who are uncomfortable reading in front of their peers are at ease reading to the dogs. This program helps kids gain confidence and overcome their anxieties. K9 Comfort Dog teams were sent in to comfort the children at the Sandy Hook Elementary School almost immediately after the horrific shootings. Children were able to tell the dogs more about what happened than they could tell their parents.

For many years, guide dogs have served blind or visually impaired people giving them their mobility. Many organizations now test and provide accreditation to service and therapy dogs. These dogs must meet rigorous standards of temperament and obedience; they have to be accepting toward friendly strangers, sit and stay on command, be able to walk through a crowd with wheelchairs, and not startle easily. It takes several months to teach our canine friends their cues and responses to each of these specific situations, but once this is accomplished there is no measure to the value they can bring to us personally and as a society. They offer comfort, protection and companionship – but beyond that – there is no limit to what the future of science may bring, because the dog's nose knows more than we ever imagined!



A dog being trained to detect ovarian cancer at the Penn Working Dog Center. Photo courtesy of the University of Pennsylvania SVM.