A Tail of a Dog: There are different views on what a dog on point should look like.

What role did nature play to begin with?

By Joe Schmutz

Millions of upland-bird hunters have had their spirit lifted by a dog on point. The frozen body posture is unmistakable. Even non-hunters recognize it and are wowed in admiration. There is something about it – it's infectious, maybe it awakens our primal stalking instinct.

A dog on point may freeze stiff-legged with head and tail high – the so-called 'high-on-both-ends' stance. Or, the body is crouched, frozen in a stealthy approach often with front paw raised in a paused stalk.

A pointing dog's tail reveals state of mind, as can its body. What is the meaning of tail positions among pointing dogs? How did pointing dogs come to be in the first place? How do we know? – Let's explore it.

Different pointing styles with the same function - how so? Photo J. Schmutz

In their study of how major traits in dogs arose throughout dog ancestry, Kathleen Morrill and her colleagues (Science Issue #6592) concluded that only what they call esthetic traits, characteristics that define breeds, are recent. Basic behavioural traits that have functions such as hunting, guarding or herding, are ancient in their basic form with only subtler distinctions that are more recent.

There is widespread agreement that pointing by dogs is rooted in the pause-before-the-pounce of hunting, wild canids. It came to us via this 'standing, even trembling in excitement' as the Greek historian Xenophon (430-355 BCE) described it. What confirmation of this supposed agreement can a quick survey of canine natural history provide?

The fox in the photo sure looks like a dog on point. The pause apparently gives canids time to localize the scent or sound. Once located, the fox pounces.

J. David Henry observed Red Foxes in Prince Albert National Park in Saskatchewan (1993, "How to spot a fox," Chapters Publishing Ltd., Shelburne, Vermont). His tally of 434 hunts, showed that when encountering small rodents, birds or insects, the foxes pause. They fix their eyes on where the movement, sound or scent came from, freeze for several seconds and then pounce. Using this pause-before-the-pounce method, the foxes were successful 32% of the time with small rodents, 2% with small birds and 82% with insects.

A red fox pausing. Head is up looking over tall grass. Instead of front paw up, the rear legs are angled for maximum propulsion, with tail at 8 'o clock ready for steering in mid-air. Photo J. David Henry

Incidentally, at least two accomplished upland bird hunters have suggested that we pause near promising cover while hunting grouse or pheasants. This stopping, they say, more often than not will prompt birds to flush from dense cover. Perhaps wild birds have caught on to the foxes' methods. The birds may recognize the pause by its silence and try to fly before the fox has fully pinpointed them.

When detecting rabbits, J. David Henry writes, foxes chase immediately. The most successful way for a fox to catch rabbits may be to chase it down rather than to surprise it in a pounce. Wolves apparently hunt big game more like foxes hunts rabbits. Wolves first follow tracks, then chase and finally cause big game to stand in defense. This sequence must have been very useful for ancient human hunters. For a successful kill with bow and arrow, atlatl or lance, the hunter needed to be close. The dog's role was to force the animal to stand in defense until the hunter arrives. This chase-stand-kill scenario is not about pointing, it's instructive about tail positions, but let's leave that for later.

When pointing became useful after scatterguns became light enough to swing, hunters must have reawakened the wild canines' pause in their dogs. Through training and selective breeding, they shaped, even exaggerated, the pause into what we now call pointing. While the gene-to-behaviour complex that underlies the pause before the pounce might have been disrupted from none-use between domestication and today, parts of the complex remained.

Pointing behaviour is heritable as this 12-week-old puppy helps to illustrate, by sight-pointing a grouse wing on the ground. Photo J. Schmutz

Molecular-genetic studies by Jörg T. Epplen and colleagues at Ruhr University in Germany, showed promising DNA variants on chromosome 22 in six of seven pointing breeds (Canine Genetics and Epidemiology, 2015, 5:2). These presumed pointing genes were absent in herding breeds. The results are consistent with the interpretation that even within versatile breeds, there were two routes through which the pointing behaviour developed. In one route, exemplified by the German Short-haired Pointer, the dogs trace back to a hound origin, whereas the other route, Large Munsterlanders and Weimaraners, trace back to a bird dog origin.

Today's pointing Labrador aficionados also showed that the pointing behaviour could be re-awakened in the dogs' genomes, even in a retrieving breed. They apparently chose individual labs that were prone to hesitate or pause, and selectively breed them. They may have crossed in some pointing dogs to speed up the process.

Why might we care about tail position of dogs on point?

When hunters mingle and describe the behaviour of the dogs on the hunt, the descriptions sooner or later include body posture and tail position. Why do tail and body position matter?

The 9 o'clock tail is equally evident on dock-tailed versatile dogs, as this Pudelpointer shows. Photo Craig Wilson

The versatile dog- and pointing-specialist aficionados differ on the topic. The three main versatile-dog testing organizations, the Jagdgebrauchshundverband (JGHV-North America), the North American Versatile Hunting Dog Association (NAVHDA) and the Versatile Hunting Dog Federation (VHDF-Canada and -US) expect a dog to stop on scenting game. The dog can and should alternately track and point a moving bird, commonly pheasants. The dog should show intensity in its demeanor indicating that game is nearby, stand and nearly tremble as Xenophon put it. All three organizations agree that the dog's style on point, such as head or tail position, is immaterial. Most importantly, a dog on point across a deep and shrub-filled draw, should give the hunter good indication through body language that a bird is present and that the hike across will be worth it.

The field-trial aficionados, in contrast, place great value on style. Robert G. Wehle (1964, "Wing and shot gun dog training." Country Press, Scottsville, New York) describes "good pointing style" as "The dog's head should be held high in the air, his tail straight and high, well above the back level. His whole body should be rigid and motionless and remain that way until the game is flushed." The English Pointers in the photos illustrate this style well.

A 12 and 10 o'clock English Pointer share a scent cone high-on-both-ends. In some classic hunting settings, the job for these two dogs would be done. A retriever would be brought up for the retrieve while these two pointers run on to find the next bird. Photo Howard Coneybeare

Craig Doherty, in his article in Pointing Dog Journal (Vol. 22(4):32-35), points out that the 12 o'clock tail of English Pointers and Setters is a North American field trialers' creation. It is not typical in British pointers nor show-bred English pointers in North America. It is a fundamental style-expectation that Doherty predicts is here to stay.

If the commonly held deduction is right, that pointing in our dogs is rooted in the ancestral canid's pause-before-the-pounce, then the phrase the "whole body should be rigid and motionless" is right on. After all, that's what the fox in the picture is doing as did others described by J. David Henry.

If the 12 o'clock tail is a North American field trialers' preoccupation, when and how did it come about? Let's try when?

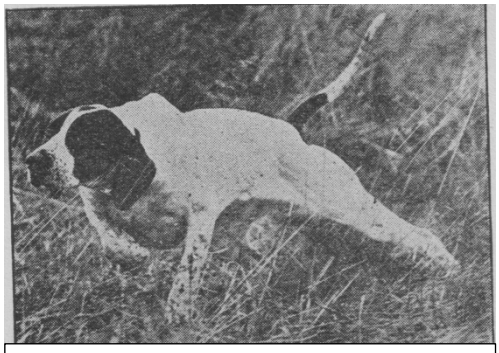
A.F. Hochwalt, shows 13 English Pointers and 14 English Setters in his 1922 book "Bird dogs: their history and achievements" (Sportsman's Digest, Cincinnati, Ohio). The distribution of tail positions was very similar between the two breeds: 8 o'clock = 7%, 9 o'clock = 26%, 10 o'clock = 48%. 11 o'clock = 19% There was no 12 o'clock tail among the 27 dogs.

Robert G. Wehle's book published in 1964 shows photographs of 34 English Pointers. Their tail positions are: 10 o'clock = 12%, 11 o'clock = 35% and 12 o'clock = 53%.

This suggests that the pointing dog's tails moved from a 9:45 position pre 1922 to 11:30 by 1964. One field trialer confirmed this trend in a personal communication and suggested that the tail-up trend began in the 1940s.

Many English Pointers in Hochwalt's book show a dog frozen in a stalking position. The top line over tail, body and head is nearly straight. It appears that the high head may be a more recent trait also. Maybe the high head and tail happened together and are somehow connected?

A photo in Robert G. Wehle's book of a skeleton of a dog with a 12 o'clock tail shows that the sharp upturn occurs within the first three tail vertebrae. The rest of the tail is nearly straight. The 12 o'clock tail seems to provide no clear benefit for hunting *per se* – or does it?



A pre-1922 English Pointer in an intense pointing stance, from A.F. Hochwalt

What's a dog's tail good for?

If we could understand the functions of a canine's tail, we might better understand the whys and wherefores of different pointing dogs' positions.

Virtually all vertebrate animals have tails. Frogs are an exception. Tree squirrels have long bushy tails used for steering as they leap from branch to branch. The tails of ground squirrels and prairie dogs, are shorter and with shorter hair that is less prone to get in the way in a burrow. Steering is not quite as critical when squirrels move only on the ground.

The tails of foxes are long and bushy like tree squirrels. It's an excellent steering tool in a pounce, or on a fast run after rabbits. J. David Henry shows four hunting poses by foxes in his book. In three pictures, the tails were at 6:30, 7 and 8 o'clock while the fox stood – about 7:15 on average; and in one picture at 10 o'clock while the fox was pouncing.

Photos by John Vucetich and Rolf Peterson from their studies at Isle Royale National Park in Lake Superior, Michigan showed the tails of Gray Wolves in mid-position and moving when about to attack a moose. These wolves are past the pause-before-the-pounce stage but their tail positions are instructive. The tails of eight wolves in two pictures (one photo shown) were at 9 o'clock at the base and then gently curve upward to 10 and 11 o'clock. One wolf, had a straight tail at 11

Which wolf will risk to be first? Tails are in mid positions, bodies tense and apparently moving. Photos J. Vucetich & R. Peterson https://isleroyalewolf.org

o'clock, say 10:15 on average. These wolves are beyond pointing, if they ever did so in this hunt. Now, they mean business.

While the tails of the foxes were motionless, as suggested by the tail being as sharp photographically as the foxes' bodies, several of the wolves' tails were apparently moving. Logically, a fox creeping up on prey would do better being as immobile as possible. The wolves' tails were likely at rest too but only while creeping up on this initially unsuspecting moose.

Overall, the photographs and observations suggest several possibilities regarding the function of tails in foxes and wolves:

- Fox and wolf tails are the bushiest parts of their bodies, more so than one would expect from the need to keep tails warm. It is plausible, that, as with tree squirrels, the bushy tails provide more resistance in air and thus more steering potential. The faster a bushy tail is flicked, the more resistance it offers - more steering power.
- Neither wolves nor foxes held their tails at 12 or 6 o'clock. If the tail is indeed helpful in changing running or pouncing direction, then a tail flick to the left would help push the body to the right, and vice versa. Similarly, a tail flick upward can place more traction on the rear paws. A wolf dangerously close to the hooves of a moose will not know in which direction it may have to move in a split second. By keeping a tail somewhere in the middle, close to 8 – 10 o'clock, the wolf is able to flick its tail to advantage in any direction. The wolf is hedging its bet – as, I suggest, is the frozen-stalk-point of mid-tail or versatile hunting dogs.
- The tails of wolves in attack mode appeared to be moving. For pointing dogs, we call that 'flagging.' It is conceivable that a tail with muscles already responding to signals from the nervous system can be moved more quickly in a new direction than a tail at rest.

From my personal experience in judging hundreds of mostly versatile breeds in the NAVHDA and VHDF field-testing systems, I sensed that hunters are willing to credit a dog on point "when rigid and motionless." While few seem to care about the tail's elevation, they do look askance at a tail flagging.

This dog frozen in a stalk does not consider it's job done. It holds its point cooperatively through flush, maybe even shot and fall. Its tail and body posture maximize the soon needed steering and propulsion, for the run to the fall and retrieve to hand. Photos J. Schmutz

Maybe North American field trialers have preferred the 12 o'clock tail for the message the dog sends, as in "OK, boss, I'm frozen on point and to prove that, I will stay – well broke. My 12 o'clock tail is giving up some would-be steering-on-pounce advantage. I've done my job, stage two is now yours!" This is consistent with high-tail pointing specialists not

Mendel's Punnett squares will likely remain a foundation in genetics. However, geneticists have learned much new about DNA and gene-environment interactions, This gives us so many new ways to look at inheritance and evolution of our best friend. Photo J. Schmutz

always being keen to retrieve. Most versatile dogs, with their tails at 7–10 o'clock, are keen to run and retrieve right after the shot unless well trained to be steady through shot and fall. The high-on-both-ends pointing dogs have in a sense accepted a handicapped position to prove their willingness to remain on the spot.

The field trialers may not have reasoned their preference via this handicap notion as I just did. They may simply have acted on what their sense told them, from training and observing pointing dogs time and again. The dog with a 12 o'clock tail may be more willing to stay put than the one hedging its bet by keeping its tail in mid-position ready to pounce. Or, at least, the dog with a 12 o'clock tail may require less training to become 'well-broke.'

Changing a dog's tail position, but how exactly?

Neither Hochwalt, Wehle nor Doherty have explained as cited above why North American field trialers favored the unusual 'high-on-both-ends' pointing. Could it be that the stance came about by chance first and then was applauded and retained through selective breeding?

The usual and clearly successful method to alter the form or behaviour of any animal is to use goal-oriented selective breeding, performance-based in other words. Dogs exhibiting the desired form, or the form nearest to it for starters, are bred generation after generation. Is this 'directional selection' what actually happened with tails?

For the selective breeding toward a 12 o'clock tail to work, the 10-11 o'clock positions had to be heritable too. But how did the 12 o'clock tail become 12 o'clock when neither foxes, wolves nor English Pointers in Hochwalt's time seemed to have had the 12 o'clock phenotype?

Dogs provide the best example of how different traits can arise in time: giving rise to extremes from Dachshund to Irish Wolfhound and from bloodhound to Nova Scotia Duck-tolling Retriever. Different traits were either present but hidden in ancestral wolves, or arose via mutations throughout domestication, or both.

When we once thought that the genetic make-up of an organism was largely fixed, the science of biology and genetics has turned this simplified notion up-side down. Some of the variation-causing mechanisms are alluded to in phrases: co-adapted gene complexes, deletion-, duplication- and re-arrangement of DNA segments, horizontal gene transfer, epigenetics and the like. The many ways in which genomes can change is both marvelous and mind-boggling.

Maybe field trialers had help from nature, i.e. directional selection made possible only after some spontaneous change in the English Pointer's or Setter's genomes.

The stiff-posture high-on-both-ends pointing stance is remarkably similar to the postures of male dogs, trying to size each other up before engaging in a fight, or not fight. John W. S. Bradshaw and Helen M. R. Nott describe a dog's "dominance posture" as "stiff, tall stance; ears up or forward; tail out or up" (p. 123 in 1995, The domestic dog, its evolution, behaviour and interaction with people. James Serpell, Editor, Cambridge University Press, U.K.).

It is conceivable that a subset of the genes that influence dominance signalling were duplicated or otherwise linked purely by chance to the pause-before-the-pounce set of genes. Then, very quickly, the high-on-both-ends pointing could

have been created by a kind of borrowing/copying of genes. Field trialers, understandably, could have favored such a unique and perhaps compelling posture once they saw it.

There is an approach to breeding common in field trial circles that could have facilitated the spread of this newly duplicated gene complex. Field trialers value champions and preferentially breed these, time and again. Coupled with line- or inbreeding (e.g. Robert G. Wehle, p. 138). In this way, a rare gene complex has a good chance of being retained and spread in a population. This is how the dominance-gene packet, when linked to the pause-before-the-pounce gene packet, could have spread in the English Pointers and Setters.

Mine is a provocative notion: i) duplication of dominance signalling genes, ii) their cross linking with pausing pursuit genes in the genome, and iii) strengthening the classic high-on-both-ends pointing via subsequent selective breeding. The rapid emergence of complex traits by chance is not without precedence, nor is re-arranging traits into new and useful packages.

Recent studies of the molecular genetics and ecology in many different animals provide examples of surprisingly rapid shifts in anatomy and behaviour. These can be rapid step-wise shifts compared to slow linear changes. One such example is provided Emily R. Hager and colleagues (Science Issue #6604) studying the differences in hair color and body size among Deer Mice which are widespread throughout North America. Their research, comparing forest and grassland mouse ecotypes in Oregon, indicates that a chromsome inversion, flipping a section upside down, has rearranged some genes in one group. This allowed natural selection to favor grassland and woodland populations separately leading to the two mouse subspecies we recognize today.

The similarity to pointing might be, that similar genome changes in pointers linked the stop in a dog's pursuit of game to the proud high-stance position, away from stalking-body position. Field trialers, like mother nature in woodland Deer Mice, then favored the high-on-both-ends stance and fine-tuned this behaviour. In this way, when we have wood- and grassland Deer Mouse ecotypes, we have British- and possibly show pointers different from North American field trial pointers.

Perhaps science will one day verify my notion of dominance-signalling becoming 'high-on-both-ends' pointing. Or, science will soundly reject it. For now, the notion lies in the realm of imagination. It can spur a hunter's pondering while walking gun-in-hand behind the dog at work. The notion can provide insight and thus more meaning around the dog-human collaboration we regularly experience afield.

Extended stalking behaviour - A 6-mos.-old Wire-haired Pointing Griffon, alternately tracking and pointing a running pheasant. Photo Patricia Oderkirk

A pinnacle of domestication

Whatever the precise timeline or route by which hunters have created a behaviour that now defines pointing dogs, the achievement is nothing short of spectacular. The precise nature of the behaviour has been changed from a predator-prey pause to exquisite dog-human cooperation. While the pause-before-the-pounce can be logically called the precursor of pointing, the two are not the same.

The fox decides to pause for its own purpose and also ends the pause on its own. In contrast, pointing dogs hold their pause for the hunter to end it via the flush. Pointing dogs often pause at first notice of scent, farther away from the game than a fox would. Pointing dogs can display exquisite cooperation and even decision-making, including alternately pointing and tracking a running pheasant.

The next time when our spirits are lifted by a dog on point, let's applaud the foresight and diligence of the many hunters who allowed us the opportunity. Pointing dogs, especially when coupled with tracking, use of nose and retrieving, may represent the pinnacle of animal-human collaboration. This is true considering the many divergent and often conflicting

motivations a dog must be in control of: an energetic search suddenly shifts into cautious pointing; a high nose sifting the wind to a nose buried in vegetation on a track; from frozen on point to marking a fall and delivering birds to hand.

There is no other domesticated animal of which we make such high demands, than our pointing dogs. This is a tale that deserves to be told and remembered.