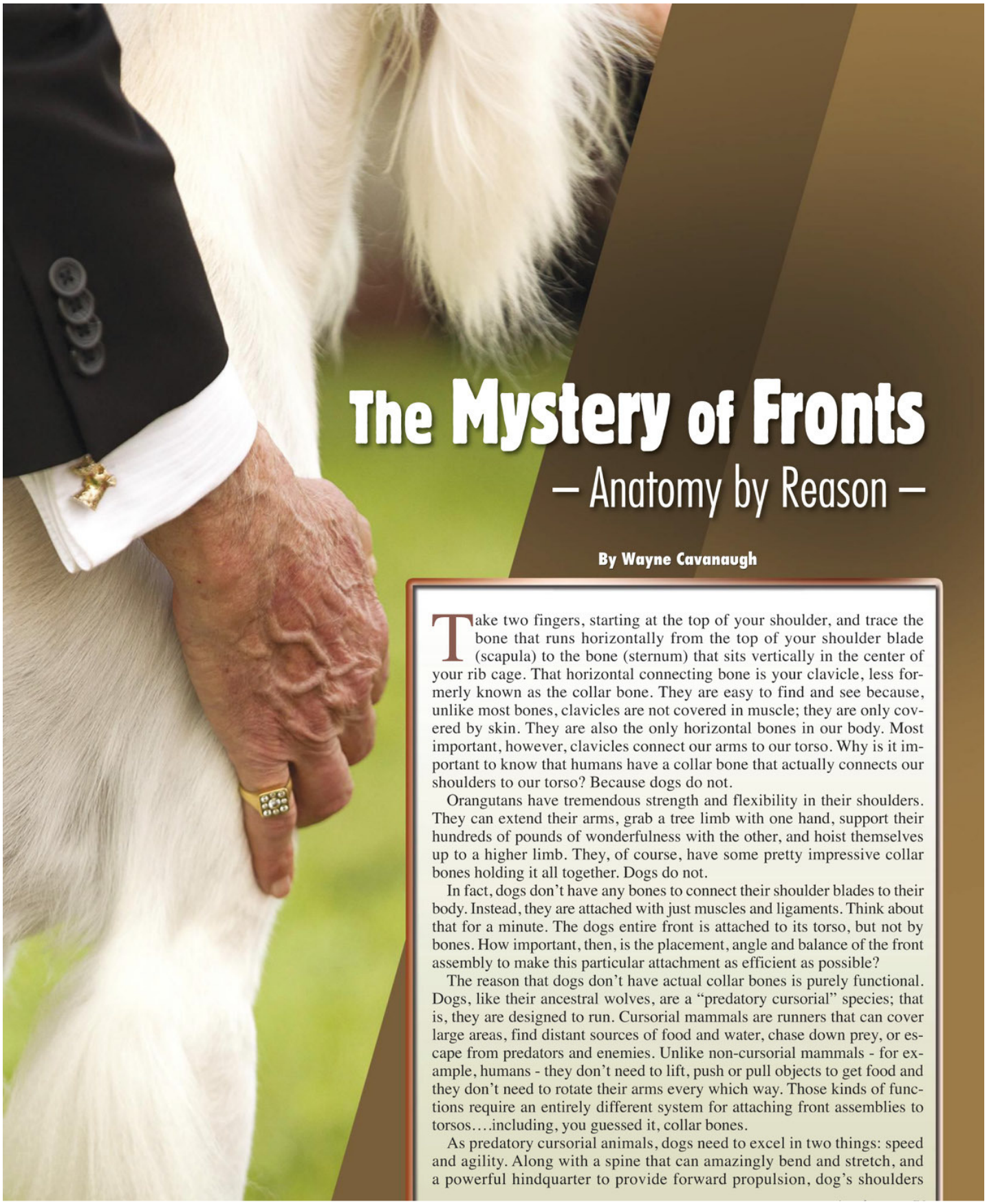


The Mystery of Fronts

– Anatomy by Reason –

By Wayne Cavanaugh

Take two fingers, starting at the top of your shoulder, and trace the bone that runs horizontally from the top of your shoulder blade (scapula) to the bone (sternum) that sits vertically in the center of your rib cage. That horizontal connecting bone is your clavicle, less formerly known as the collar bone. They are easy to find and see because, unlike most bones, clavicles are not covered in muscle; they are only covered by skin. They are also the only horizontal bones in our body. Most important, however, clavicles connect our arms to our torso. Why is it important to know that humans have a collar bone that actually connects our shoulders to our torso? Because dogs do not.

Orangutans have tremendous strength and flexibility in their shoulders. They can extend their arms, grab a tree limb with one hand, support their hundreds of pounds of wonderfulness with the other, and hoist themselves up to a higher limb. They, of course, have some pretty impressive collar bones holding it all together. Dogs do not.

In fact, dogs don't have any bones to connect their shoulder blades to their body. Instead, they are attached with just muscles and ligaments. Think about that for a minute. The dogs entire front is attached to its torso, but not by bones. How important, then, is the placement, angle and balance of the front assembly to make this particular attachment as efficient as possible?

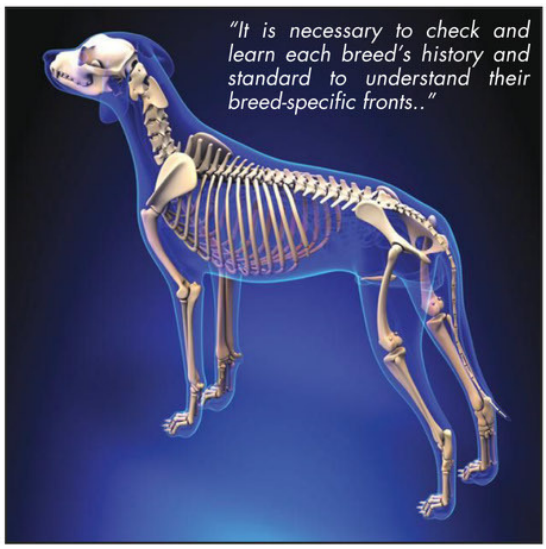
The reason that dogs don't have actual collar bones is purely functional. Dogs, like their ancestral wolves, are a "predatory cursorial" species; that is, they are designed to run. Cursorial mammals are runners that can cover large areas, find distant sources of food and water, chase down prey, or escape from predators and enemies. Unlike non-cursorial mammals - for example, humans - they don't need to lift, push or pull objects to get food and they don't need to rotate their arms every which way. Those kinds of functions require an entirely different system for attaching front assemblies to torsos….including, you guessed it, collar bones.

As predatory cursorial animals, dogs need to excel in two things: speed and agility. Along with a spine that can amazingly bend and stretch, and a powerful hindquarter to provide forward propulsion, dog's shoulders

are designed for balance and to increase the length of their stride. To make this all happen, extreme flexibility is vital and fundamental.

Imagine watching an aerial view of the shoulders of a gundog slicing through a field. Quick bursts of speed, stopping, starting, twisting and turning on a dime, then stealthily indicating its prey. You can see all the beauty and magic of anatomy at work. Notice how the entire front assembly is attached to the body at the shoulder, tenaciously clinging by a wrap of muscles.

Like the ease of seeing the human collar bone under the skin, learning to see correct front angulation and shoulder layback shouldn't be all that difficult. Here's a tried and true shortcut. Picture yourself holding a string with a rock tied to the end. For the vast majority of breeds, if you were to place the string right on top of the withers, the rock should fall right to the foot if the front is correctly made. Pretty simple to observe.



Not only is this a key indicator of what's underneath, it shows where 60% of the dog's weight is supported. Still, we continue to see dogs winning with feet set under the ear, placing all the weight in a precarious position at best. Where that's the case, there is something terribly wrong with the placement, angle, and length of the shoulder blade and upper arm. For a dog to efficiently pivot, turn, push off its front and run, the weight of the dog should be centered under the withers. It's a matter of learning to see balance.

There are two major bones involved in forming front angulation: the shoulder blade, with its nifty spiny ridge hopefully pointing in the right direction, and the upper arm. They are of equal length and form a 90 degree angle. If the 90 degree angle concept of angulation is difficult to understand, picture a capital L spun one quarter of a turn and there you have it.

One of the most common front problems occurs from disproportionally short upper arms. A dog with a proper length shoulder blade but a short upper arm cannot extend its front efficiently. Equal length of these bones is required in the vast majority of, but not all, breeds. There are several beautiful exceptions to length and angle of the upper arm in several breeds. Ibizan Hounds come to mind; their overall construction and athleticism creates a unique and gorgeous movement appropriate for the breed. It is necessary to check and learn each breed's history and standard to understand their breed-specific fronts, especially regarding the length and placement of shoulder, upper arm, and leg.

Of course, correct canine fronts aren't as simple as angulation alone. The skeletal part of a front includes: the shoulder blade (scapula), upper arm (humerus), elbow, forearm (radius and ulna), wrist (carpus), pastern (metacarpus), and digits (foot). No one needs to know all the Latin words to be a good judge, just knowing the part and premise will do. The importance is in knowing the size, shape, and placement of each bone and how they "articulate" or join together.

Breed-specific width and depth of forechest also contribute to a good front. The forechest depends greatly on the shape, required capacity, and length of ribcage for each breed. (While primarily discussing fronts here, the incredible ribcage deserves a separate discussion of its own). As in humans, dogs have a sternum that joins both halves of the rib cage together. The point of the dog's sternum, called the poststernum, is the most forward part of the body and can be easily found with the touch of a hand. It's placement and degree of prominence is another indicator of where the front assembly is placed in relation to the overall dog.

The amount and shape of bone is also important for the front's breed-specific function. Should it be oval, blade, or round in the breed and why? Same for feet. Should they be cat, hare, round shaped or other? How big and why? And pasterns, how much slope? Speaking of pasterns, does it seem they've nearly gone missing in a breed or two?

Another key feature of front assemblies is the length of the front legs. For example, in many breeds, the height from the foot to the elbow should be equal to the height of the elbow to the top of the withers. That is not an arbitrary requirement. It is specifically intended for movement appropriate for the breed. It seems to me that this requirement is being ignored in a few popular breeds that require this particular proportion. Tape measures aren't required to see it. The naked eye surely should be able to see elbow to ground and elbow to withers proportion. Obviously, short-legged breeds bred to burrow, dig, hunt between rocks, and weave between hocks of livestock have their own unique leg length proportions. Again, read each breed standard to see how different kinds of fronts should be constructed and find out the reason and function as it applies to the breed.

A discussion of fronts wouldn't be complete without a tip of the hat to necks. A dog has seven cervical vertebrae. Do you know how many a giraffe has? Seven, same as a Shih Tzu, elephant, human, and mouse. All mammals and dog breeds have seven neck vertebrae. The exceptions are manatees and sloths.

So what is the proper collective length of those seven cervical vertebrae for each breed and why? How long or short does a neck need to be to perform its function, to reveal its history? How thick

My late friend, Dr. Jim Edwards, used to say that, because of his academic history in zoology and genetics, his initial approach to judging was from the inside out. Many will start from the outside instead. I don't believe it matters either way as long as there is a serious understanding of the fascinating anatomy, the symphony of bones that reside inside.

Unlike Jim, I don't have a PhD in any science that is based on anatomy. I'm just an unabashed perpetual student trying to learn more every day. This discussion on fronts is just a collection of my biases and concerns regarding the anatomy of front assemblies in dogs. They are not intended to be the answers. Instead, the goal is to offer some starting points from which we can all ask questions to ourselves and each other. All this, while continually learning how to best see a dog.

***Note:** At the risk of confusing the issue, and before an anatomist calls, dogs technically do have a teeny anatomical bit named the "clavicle." It's not, however, anything close to what you'd think of as a "collar bone." It is about 1/10th of an inch-wide, made of cartilage, and it doesn't articulate with any bones. It is so small that it usually isn't visible on radiographs.*

and what shape are the muscles that support those vertebrae? How do those muscles and ligaments blend and wrap around the shoulder? Do short necks flow into the shoulders the same way longer necks do? How are the shape of the neck and front related? How much strength is required to support the weight of the breed's function? For that matter, the neck also has to support the weight of the head. I do not know what an Irish wolfhound's head weighs but when mine inadvertently smacks his head into me, it feels like getting hit by a train.

One thing is for certain, though. If you run your hands down from the top of the neck to behind the shoulders and you feel the connection isn't smooth and strong, you should find out why. A smooth blend of neck into shoulders isn't only nice to look at, it also defines the way the neck and spine fit together to provide the most flexibility and strength.

The first element we think of in determining a smooth transition from neck into shoulders is the length and layback of the shoulder blade. Accordingly, the shoulder blade must be oblique; that is, it must slant back into the body with proper layback and be almost slightly curved inward at the top for a smooth transition. While it may require feeling through muscle and fat, the top of each shoulder blade is easy enough to find. If they're not where you'd expect, try searching in the neck where steep, straight shoulders love to hide.

Most breeders would agree that correct, breed-specific fronts are the holy grail - one of the most difficult things to attain and consistently produce. One reason is the precarious way in which it attaches to the torso. Another is that it's a collection of so many individual pieces that each need to be correct on their own. And, they must also connect and contribute harmoniously.