It's a Matter of Physics

An Introduction to the Functional Aspects of Conformation

Down on the Farm

by JW EQUINE

Over the years I have noticed that people generally judge horses based on their musculature, and when a person includes skeletal observations, those are limited to the legs. To me muscles can be changed through training, but the skeleton remains the same—at least in regards to the angles, the relationships and the function.

It seems logical to me that no matter how physically fit or muscular a horse becomes, he cannot overcome a skeletal structure that severely limits ability. If the levers and gears aren't efficient, he will be slower.

The Unbalanced Horse

We all know that there is no perfect horse, and from that we can extrapolate that every horse has to compensate for something. Some are built to run a particular distance better than others, but all horses are either limited by their construction or able to compensate for it and, as the racetrack often proves, some are better at compensating than others.

It's probably safe to assume that the best horses are built to compensate, or at least have fewer, or less drastic, imbalances to overcome. Small imbalances can be compensated for easily, but big ones cannot. It's a matter of degrees. If a horse has great rear angles for a specific distance, but does not have equivalent angles up front, then he has to compensate. Likewise, if the front angles are good and the rear ones are not, the horse has to compensate. Perhaps he has to 'climb' with his front end, 'hop' behind or just slow down.

On top of that, in order for him to succeed, he will have to be strong in the area used to compensate, but if the degree of discrepancy is too great, the horse will be limited no matter how strong he is or how he tries to compensate. And, if he is weak in the area of compensation, he will be limited. It's a matter of physics.

The Purpose

To explain this further, we should establish what the racehorse has to do mechanically and what functional aspects contribute to or inhibit top-class ability.

For simplicity, let's say the horse has to generate power from his hindquarters, transfer that power forward and then reach forward with his front end at the same stride rate created by the hindquarters, for efficient speed. If he has to slow the stride rate fore or aft, he is likely not going to win races in top company.

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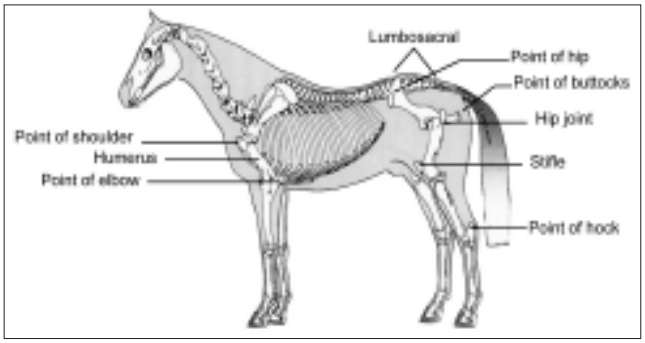
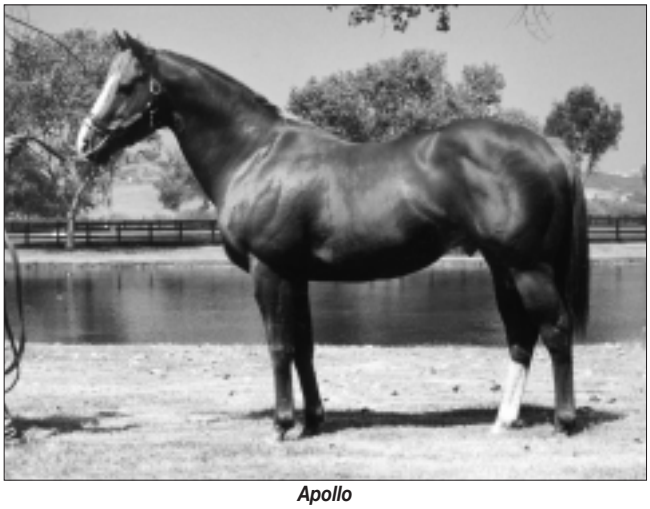


Skeletal Diagram Customized from *A Photographic Guide to Conformation by Robert Oliver Photography* by Bob Langrish

Indian Charlie



Apollo

Surachai

Down on the Farm Contd.

Functional Points

For the purposes of this introduction, we'll use only a few of the points noted on the accompanying skeleton illustration: the point of hip, lumbosacral joint, stifle, point of shoulder, humerus and elbow. You may notice that the humerus doesn't actually reach all the way to the elbow, but we can still use the point of shoulder and elbow as reference points to assess the length and angle of the humerus.

In clinics, seminars and workshops, the point of buttocks, hock angles, lengths of back and neck-sets are also considered, but they are beyond the scope of this article.

The Balanced Horse

A horse whose angles match—sprinter quarters and sprinter front-end or distance quarters and distance front-end—is what I call balanced. However, if his lumbosacral joint (that slightly raised portion of the croup) is not directly above the point of hip (or very nearly so), he is going to have difficulty transferring his power forward and be prone to soreness in that area. Our sample horses all display a lumbosacral in close proximity to or directly over the point of hip, as do all the horses I've seen that had very long careers. It is particularly evident in the photo of Indian Charlie.

The lumbosacral is one of the main areas of compensation, so it needs to be strong. The farther it is from the point of hip, the weaker it is.

Even if the angles match and the lumbosacral is correctly placed, an elbow that is too close to the ribcage, can limit a horse. A nicely-bred prospect who was a mystery to her owners, trainers and vets, serves as a good example. She wasn't really lame, but she was definitely off when pushed. She stood slightly pigeon-toed, but walked perfectly straight, and she was choppy in her gaits. I found that her elbows actually hit her ribcage. You literally could not hold your finger between them when she took a step. Imagine what happened when she tried to extend her stride or move with speed.

She had learned to shorten her stride up front in order to save herself from pain. She did not want to rotate her body weight over that point of contact, so she quickened the stance phase of her stride. In order to quicken that portion, she had to shorten the swing phase, which explains why she was choppy. It also explains why she stood toed-in but walked straight. She was avoiding that contact. She would not be a racehorse, and I suggested that if she were to be used as a broodmare, that the stallion of choice should be checked for ample room behind the elbows. Just one more thing to consider.

Richter Scale

Snow Chief

©Mari Carlos

©Lisa Groothedde

Tiznow

Flying Continental

Sprinters

From a functional perspective, sprinters have stifles quite a bit higher (near or at the level of the sheath of a male horse when viewed from the side) than in the stayer. The photos of Apollo and Surachai illustrate the stifle placement of a sprinter.

Like the Quarter Horse racehorse, the sprinter will usually have a shorter humerus (elbow to point of shoulder) that is considerably angled upward. This allows the front end to get off the ground quickly so that impulsion from behind does not need to be impeded. The photos of Apollo and Richter Scale illustrate the humerus angle well.

Many people can see different body types in successful sprinters; I see different musculature but similar points of function. All have stifles close to their bodies for that power stroke behind, and all have a lumbosacral directly over the point of hip in order to transfer that power forward. However, differences in appearance—but not in function—can appear in the shoulder and humerus relationship.

Compare the shoulder angles of Apollo, Richter Scale and Surachai and you will see differences, yet all are built to get their front feet off the ground quickly, despite the differences in humerus and shoulder. That is why I don't think you can judge the shoulder without considering the humerus.

Stayers

All stayers have stifles well away from their bodies (well below the level of the sheath in a male horse when viewed from the side), as demonstrated by Snow Chief and Tiznow. The stayer has stifles further from the body to maximize stride length and therefore does not need to lift the front-end as quickly.

Compared to the sprinters, the stayers have a longer humerus (as seen in the photos of Flying Continental, Free House and Tiznow) and/or a longer shoulder (as seen in the photos of Bertrando and Snow Chief). Both of these things contribute to a longer stride. A longer humerus adds reach and if the humerus/shoulder angle is good, does not restrict stride rate.

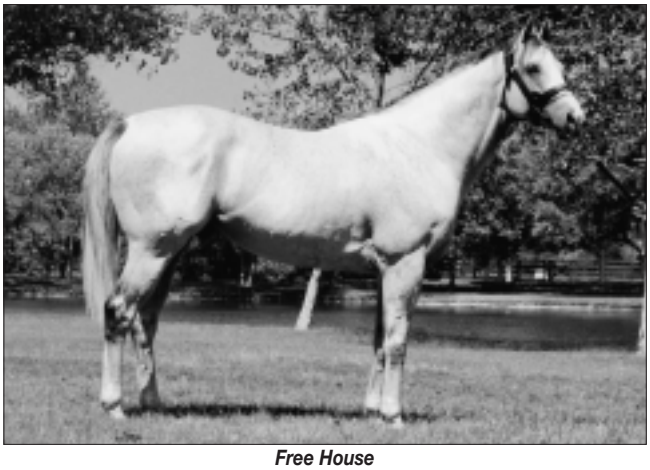
Middle-Distance Horses and Milers

Horses falling between the extremes of sprinters and stayers when it comes to distance preferences also fall between the extremes when it comes to the functional aspects of conformation. See if you can spot them in the photos of Beau's Eagle, Indian Charlie and Officer.

Improving Your Eye

One of the easiest ways to change your perspective and eliminate optical illusions is to look at a side-view photograph upside down. Unfortunately this does not work well when viewing a horse in the flesh, but with practice, your eye for the functional aspects of a live horse's conformation can improve.

For information and scheduling of JW's "Improving Your Eye for Functional Conformation" seminars and clinics, go to http://www.jwequine.com.



Free House

©Ron Masaros

Bertrando

Beau's Eagle

©Tony Leonard

Officer