

WALKING HORSES, BIOMECHANICS, THE STEPPING PACE

AND THE SPIRIT OF DRESSAGE

by Lee Ziegler, copyright Jan. 1997

It certainly would be easier if we just let our Walking Horses go along in a stepping pace. Many of them prefer to use that gait and it isn't too uncomfortable for us to ride; certainly it is easier on us than a trot. At one time there was some debate about calling the breed the Tennessee Pacer, but wiser heads prevailed and the approved gait of the breed became the running walk, not the stepping pace. Setting aside the novel idea that a horse in a particular gait breed should at least try to perform the gait his breed is noted for, there are some very sound biomechanical reasons for a Walking Horse not to work in a stepping pace.

WHAT ARE BIOMECHANICS?

First of all, for those who are not really into the subject, biomechanics is the study of the way living physical bodies move, applying basic anatomy and physics. Although this area of science has expanded dramatically with the development of the computer, video and the melding of the two, it has been around for a long time in the horse world. Early scientific studies of the action of the horse's vertebral column in motion were done as early as 1882, with knowledge expanding as techniques for photo-analysis and measurement of muscle action were developed. (Perhaps the most useful of these studies of the equine vertebral column is L.B.Jeffcott's "Natural Rigidity of the Horse's Backbone," *Equine Veterinary Journal*, 12 (3) Equine Research Station of Animal Health Trust, UK, 1980.) In short, biomechanics tells us how a horse moves and what happens to his body as he does.

WHAT IS "WRONG" ABOUT THE STEPPING PACE?

There are two things that are biomechanically undesirable about the stepping pace. The first is that to do the gait, a horse allows his vertebral column to sag downwards, causing the forward facing spines of the lumbar and of the thoracic vertebrae to impinge on one another. This can and does cause damage to the discs between the vertebrae and eventually to the spinal cord itself, especially when the weight of a rider increases the downward sag. The damage may show up as fleeting hitches in the hind legs, trouble going down hill, or occasional stumbling. You may not notice these things as a rider, but given time and enough distance carrying weight, there will be damage to the back of the horse from this aspect of the stepping pace. A horse carries weight best when his vertebral column is relatively straight, allowing space between the vertebrae and should be ridden and trained to move in this way so that he will remain sound.

The second biomechanical problem with the stepping pace is the way it causes the horse's center of gravity to shift from side to side. This puts rotary forces on the vertebral column, twisting it sideways as it sags. Imagine the effect of that on the vertebrae and the spinal cord.

Neither of these undesirable biomechanical effects occur in the walk, flat walk or true running walk (although they do happen in the racky version of the running walk too often seen in the show ring.) The vertebral column is held straight in a good walk, and the center of gravity stays centered, keeping the back stable, reducing undesirable forces on the spine. The horse carries weight better in this position than he does in the sagging stepping pace position. Yes, the stepping pace is natural, and a part of the

heritage of these horses (although there is some doubt as to whether the Narragansetts and Canadians really paced, they might have been doing any of a variety of easy gaits — we have no photographic record or clear gait diagrams of their movements) but we now know enough about the horse's spine in motion to realize that the stepping pace is not a desirable gait for carrying weight. If we are going to pursue the unnatural (from the horse's point of view) activity of horseback riding, we owe it to our horses to ride them, if at all possible, in a gait that is not harmful. Here is where dressage comes in.

WHAT IS THE TRUE SPIRIT OF DRESSAGE?

Contrary to popular belief, dressage is not about riding tests and doing abstruse movements on huge horses in fancy clothes. Dressage started as a very practical, scientific, methodical training regimen to produce sound, supple, responsive horses for use in war, then later in spectacles called carrousels. Eventually, it evolved into an art, which our modern society was unable to grasp and replaced with sport, so we now pursue test-oriented training and have largely forgotten the origins of the discipline, or the art that it can be. (The art still survives in small enclaves in Portugal, France and Vienna, but the artists are not out riding tests.) Fortunately, we aren't training horses for war anymore, but the same methods that produced practical, useful horses for the battlefield can produce useful horses for everyday trail and show riding, whether the horses involved trot like the sport horses or not.

So, while we are not going to be riding dressage tests designed for trotters on our gaited horses, that does not mean that we don't want supple, sound, responsive horses. Most of the exercises developed for basic dressage work nicely for us, as long as we do them only in the ordinary and flat walk, not the running walk. (The running walk presents balance and flexibility problems in tight circles and lateral movements.) Circles work for us because they develop balance and strength in the back. Serpentine work for us because they develop flexibility. Spirals work for us, because of the balance and strength they develop. Shoulders-in work for us, again developing balance, strength in the hind quarters, and looseness in the shoulders, a very desirable trait in a Walker. Haunches-in work for us, developing flexibility through the body. Only after we have built up our horses through these basics, working on strengthening the back, haunches and shoulders do we really get the kind of stride lengthening we want, flowing out of a strong back. Dressage really works for Walkers, but apply the spirit, not the letter of modern "sport" Dressage. Use the exercises it includes to help your horse carry his body and your weight better, without sagging his back or making his vertebrae impinge, and he will stay sound. Use school figures and progressive training to condition your horse and he will be more supple, able to negotiate rough ground on a trail, or make the corners in an arena at speed without "hopping". Apply the aids and do the progressively more difficult figures of basic dressage and your horse will be more responsive, listening to you and doing what you ask. Dressage isn't about tests, it's about intelligent, biomechanically sound training for use. And it definitely is for Walking Horses.

Some Sources on Equine Biomechanics:

James R. Rooney (1969), *Biomechanics of Lameness in Horses*, The William and Wilkins Company, Baltimore.

L.J. Slijper (1946), *Comparative Biologic-Anatomical Investigations on the Vertebral Column and Spinal Musculature of Mammals*.

J. Gray, "Studies in the Mechanics of the Tetrapode Skeleton," *Journal of Experimental Biology*, 20, p.88, 1944.

And a great combination of them all:

Jean Luc Corneille, "A Review of Research on the Equine Vertebral Column," *Dressage and CT*, 122, 123, 124, 1996-1997.