

HORSE BRAIN, HUMAN BRAIN

by Alys Culhane

Horse Brain, Human Brain: The Neuroscience of Horsemanship by Janet L. Jones, Ph.D. (published by Trafalgar Square Books, 2020) is a must-read for Icelandic horse owners. Icelandic horses tend to be more stoic and averse to training methods that involve endless repetition, and Janet Jones's science-based understanding of the horse's vs. the human's brain complements their non-reactive and people-friendly natures.

As we all know, we're in the midst of an information explosion in relation to all things equine. On the heels of natural horsemanship, with its emphasis on dominance and use of pressure/release, we're now seeing a more cognitive emphasis when it comes to horse training. The doors seem to have been flung wide open, and those people (like me) who've been attempting to make a horse-to-human cognitive connection are finding themselves in exciting territory. The new term, coined by Stephen Peters (a neuroscientist and horse brain researcher), is "evidence-based horsemanship."

The list of equine practitioners who are expanding their horizons this way includes Warwick Shiller, a noted natural horsemanship clinician who as of late has taken a more cognitively-based stance. In his podcasts, you'll hear him talk about the polyvagal nervous system and the dual roles of the sympathetic and parasympathetic nervous systems.

Numerous books on horse cognition have also come out. I've read *Horse Head: Brain Science & Other Insights* by Maddy Butcher (with Stephen Peters), *Evidence Based Horsemanship* by Stephen Peters and Martin Black, *The Mind of the Horse: An Introduction to Equine Cognition* by M.A. LeBlanc, and now *Horse Brain, Human Brain* by Janet L. Jones.

PARTNERSHIP

If you want to develop your working partnership with your horse, I suggest you first read Janet's book. Janet Jones is a cognitive scientist who writes in an accessible fashion about two equally complex areas of study, horse brain science and human brain science. Her anatomical and physiological information complements specific how-to



Book in hand, Alys attempts to figure out trailer loading prior to learning indirect training methods. Photo by Pete Praetorius.

practices. Additionally, she uses anecdotal accounts to support her assertions.

Janet believes that becoming more familiar with how horse or human noggins function will enable us to forge stronger, longer-lasting communicative bonds.

A case in point: Humans have a highly developed prefrontal cortex, conversely, equines have no prefrontal cortex. In humans, this mass of brain cells rests just above our eyes. This area, she says, "is responsible for executive function, which allows us to plan, organize, and evaluate."

Executive function provides us with the capacity for forethought, time management, decision making, and risk determination. Consequently, we have a longer attention span than do our equine partners, one that enables us to change our behavior to meet new demands. Our brains are wired for goal achievement, which is why we tend to insist and demand, rather than allow and ask. Horses lack a prefrontal cortex and therefore lack executive function. Horses, who can't conceive of goals, either comply or resist when a task is beyond their comprehension.

WORST CASE

This difference between the horse brain and the human brain explains one of the many dangers of relying on what Janet Jones calls direct commands—commands in which the horse is presented with only a single option.

Experienced trainers generally have more success with direct commands, because they give the horse clear cues, have sharp balance, and have trained and strengthened their bodies in a way that enables them to ride well. In the hands of inexperienced trainers, direct commands have their drawbacks, in that fearful horses become averse to human insistence.

How might an over-reliance on direct commands affect our day-to-day relations with our horses?

Here's a hypothetical worse-case scenario: My prefrontal cortex indicates to me that time is of the essence. I live in Alaska, where in the winter it gets dark early. My riding buddies are planning on going for a short late-afternoon ride. If I'm not there on time, they'll leave without me. I insist that Rauðhetta gets on the trailer. I'm in

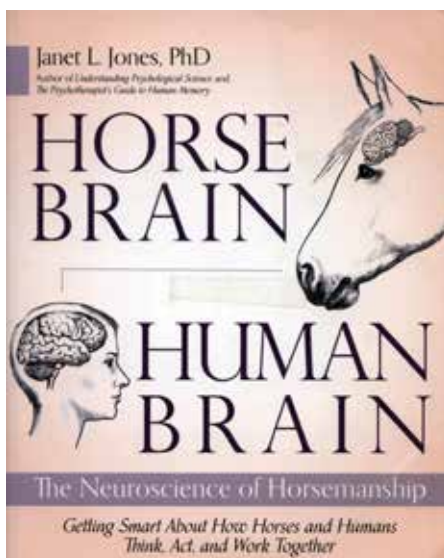
a hurry, which is why I refuse to take no for an answer. I repeatedly whack her on the hindquarters with my handi-stick, then breathe a sigh of relief as—nostrils flared, eyes wide, and ears flattened—she leaps into the trailer. I'm on time for the ride, although a bit harried. Afterward, five strong guys appear and shove the hapless mare back into the trailer. I win, Rauðhetta loses. Or did I win? I now have an even more trailer-phobic horse.

INDIRECT TRAINING

In *Horse Brain, Human Brain*, Janet Jones presents an alternative to this kind of reliance on direct commands: indirect training. This is a step-by-step process that allows the trainer and horse to follow the path of least resistance. She says, "This is partly a process of teaching your mount to depend on you for pre-frontal decisions."

After reading Janet's book, I focused on the distinction between the role of my existent prefrontal cortex and my horse's non-existent one. I internalized key terms: for example, "direct" and "indirect." I was then able to act upon multiple, related options. That is: (1) I made learning fun, (2) I relied upon the use of trailer-loading-like tasks, (3) I created an associative learning environment, and (4) I acted on a long-term, well-thought-out plan.

Reading further, I found my new understanding of indirect training solidified



Target training worked well for Rauði and her not-so-hapless owner. Rauði is happy to walk into a confined space, knowing she'll be rewarded for touching her nose to the target. Janet Jones's *Horse Brain, Human Brain* explains why such methods work. Photo by Pete Praetorius.



by Janet's description of two additional brain regions: the thalamus and the basal ganglia.

She explains that, in humans, both brain regions work with the prefrontal cortex to allow us to decide how to respond to a stimulus. The thalamus collects incoming information that is sense-related: sights, sounds, smells, tastes, touches, and non-verbal cues. The basal ganglia then prepares the body for movement in response to this information. At this point, the prefrontal cortex intervenes to consider the new data and how to react.

In horses, the thalamus collects information, and the basal ganglia prepares the body for instant movement. There is no prefrontal cortex to hold those reactions back. The horse perceives something—and reacts without a second thought.

BEST CASE

Here's a best-case scenario: I work with my trailer-phobic horse well in advance of my next riding date. I have her walk over tarps in our Playground of Higher Learning (my backyard arena), through poles laid sideways on a barrel, and under an awning.

I experiment, by first working with Rauðhetta off-lead and then on-lead. The former provides her with the time she needs to explore her options, and the latter provides her with more guidance.

What is that flapping flag attached to the cross poles on the makeshift "trailer" in our Playground of Higher Learning? What is Rauðhetta to make of this—and what am I to make of her response? I

freeze; Rauðhetta prepares to flee. I take a few deep breaths, focusing on the exhale. Rauðhetta gradually slows the rate of her breathing. We stroll around the yard, return, and again approach the dreaded flag-monster. This time, on my request, Rauðhetta walks right into the makeshift enclosure, despite the flag. When she touches the target (a foam cylinder), I click my clicker, give her a reinforcer, and praise her repeatedly. We then go for a short ride.

A few weeks later I lead my now more-confident horse up to the (real) trailer and ask her to get in. Rauðhetta makes a beeline for the target (I'd put an orange cone inside the trailer) and is rewarded and praised. Ours is a win/win situation.

A caveat: This story is an exaggeration with some basis in reality. Yes, early on Rauðhetta was slightly trailer-phobic. I tapped her on the rump with a crop, and she complied and hopped in to our straight-load trailer. A few years later we purchased a slant-load trailer and led her buddy Tinni in first. But I did build a Playground of Higher Learning in my yard and began using positive-reinforcement training techniques, including clicker-training.

But it was only after reading Janet Jones's book that I made the connection between my earlier, unsuccessful, and later, more successful efforts. *Horse Brain, Human Brain* enabled me to offer a solid rationale to people who had voiced skepticism about my use of indirect training methods with my Icelandic horses.