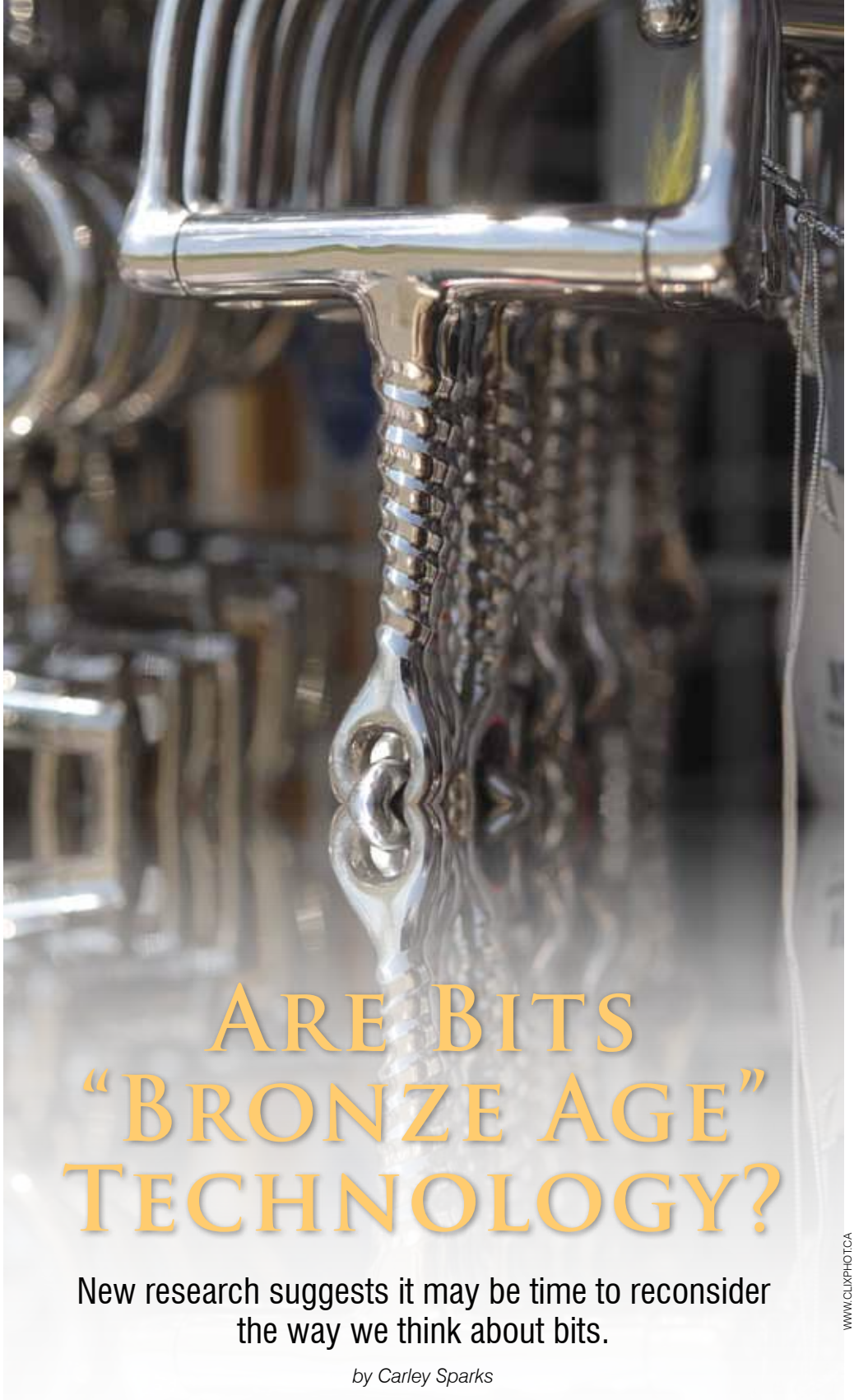

Are Bits "Bronze Age" Technology?

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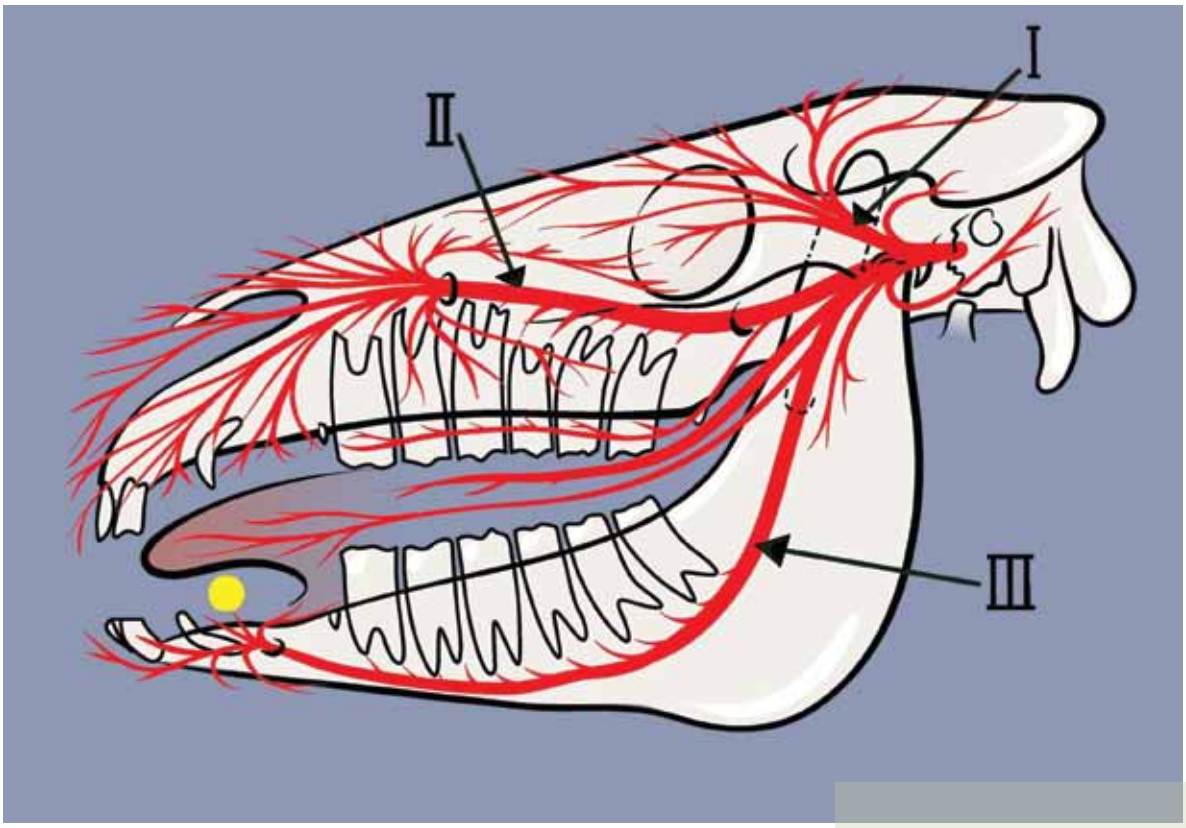
New research suggests it may be time to reconsider the way we think about bits.

by Carley Sparks

For nearly 60 years, Dr. Robert Cook has studied the horse's mouth, ear, nose and throat. The Tufts University professor emeritus has devoted countless hours, two books — *Specifications for Speed in the Racehorse: The Airflow Factors* and *Metal in the Mouth: The Abusive Effects of Bitted Bridles* — and over a hundred research articles in scientific and horsemen's journals to the horse's head. Suffice it to say that he knows a fair bit more about the subject than most.

That's important, because what Dr. Cook says about bits is shocking. If it weren't for his extensive academic background, his views might seem altogether unbelievable.



Distribution of the three-part Trigeminal nerve. Neuralgia develops when pain signals caused by the bit (yellow circle) are referred, not just to the brain (bad enough) but also along III to II (causing facial pain) or along III to I (causing eye or ear pain).

"We've grown up with the presence of a bit in a horse's mouth and accepted it without question, which is something in retrospect I can say quite vigorously was a big mistake. I accepted it, too, in spite of the fact that I supposedly had scientific training. I didn't really consider seriously what the bit is doing to the horse. And it wasn't until it was possible to communicate and control a horse without a bit and switch a horse overnight from bitted to bitless that all the information came tumbling in," he says.

Specifically, that information connects bits to a wide variety of diseases, health conditions and behavioural issues that until now were not associated with the hardware of a bridle. And it's not just physical damage to the mouth. Obstructed breathing, impaired gait and evasive behaviours are among his growing list of bit-induced conditions.

"Prior to 1997," Dr. Cook says, "I might have listed twelve problems as 'aversions to the bit.' From research completed since then, I now list over two hundred negative behaviours and forty diseases…I kick myself for not having recognized sooner that the bit causes so much mayhem. Bronze age man made a mistake putting a piece of metal in a horse's mouth."

Bits May Inflict Pain

Most riders agree that bits can cause pain to horses. A too-severe bit in the wrong hands, or even a soft one in rough or inexperienced hands, is a well-known cause of rubs, cuts and soreness in a horse's mouth. Dr. Cook's research suggests the damage may go even deeper — to the bone and beyond.

In a study published in Equine Veterinary Education, Dr. Cook examined 66 jawbone specimens from domestic horses in three Natural History museums. He found bone spurs on the bars of the mouth in 62% of the jawbones and evidence of either bone spurs or dental damage in 88%. It's probable, he says, that horses today exhibit a similar frequency of damage.

"The repeated pressure of bit on bone causes the sensory nerve to the face to become super-sensitive, i.e., to develop trigeminal neuralgia. This is the most common cause of head shaking (tossing). Horses experience pain in the mouth, but also in their face, eyes, and ears. A head-tosser may also be difficult to bridle, a persistent head-rubber, unable to stand bright light, wind or rain, and impossible to handle around the ears. Trigeminal neuralgia occurs most commonly in horses required to work with their heads in flexion."

Horses Run From Pain

Bit-induced pain isn't just uncomfortable for the horse, it creates dangerous situations for riders, says Dr. Cook. "One of the most deeply-rooted myths in horsemanship is that a bit controls the horse. It doesn't. A bit doesn't act like the brakes on a car. On the contrary, it often acts like an accelerator. Horses run from pain. If you hurt your horse, it speeds up," he explains. "Horses are prey animals. They have evolved to be frightened. Their survival as a species depended on their shyness. If they didn't flee, they got eaten."

A bit puts their evolutionary flight response on high alert. "Imagine you're riding in a bitted bridle and a piece of

THE FIELD TEST WITH AMY MILLAR

We asked Canadian Equestrian Team member Amy Millar of Millar Brooke Farm in Perth, ON, to take the crossunder bitless bridle for a test ride. Over a period of several months, she experimented with the bridle on several different performance horses of varying age, ability, and level of accomplishment. Here are her observations:

"The horses love the bitless bridle. They are much happier than they are in any kind of bit. They whoa when you want them to whoa. They don't want to run away at all. It is effectively strong without being harsh. They just listen. So for a horse with a bad mouth that has been taught to argue against the bit, it's a completely different way to get what you're trying to accomplish without an argument," says Millar.

"The other side of the coin is that for grand prix show jumping you need your horse to yield to pressure and the bitless bridle does not work the same way that the bitted bridle does. With a bit, you can have a connection between your hand and the horse's mouth. You lose a bit of that connection with the bitless bridle. You can't put your leg on and push them up into your hand," she continues.

She found the bridle best suited to horses that are naturally well-balanced and those that have a light front end. "It's a similar concept to a hackamore. The type of horse that goes well in a hackamore will likely go better in the bitless bridle. It gives better steering and a better sense of connection," says Millar.

"It also works well for horses that are 'blocked' — ones that won't go forward into a light contact and always want to stay behind the bit, so their stride is bit short and choppy. Horses like that you'll notice a difference immediately. Horses you may not even know are blocked will have a longer stride and work more through their body and shoulder just from not having the bit in the mouth."

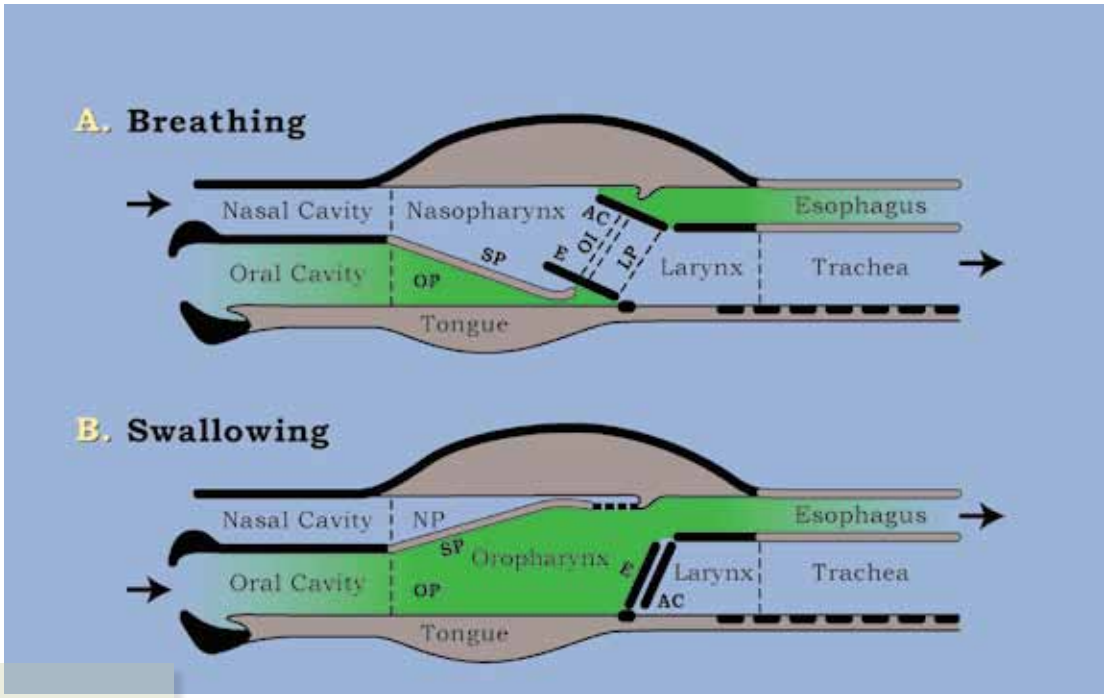
She did not find it as effective with horses that are not naturally well-balanced. "If the horse requires the rider to help them with their balance, especially at the jumps, those types struggle a bit jumping with the bitless bridle. But maybe — and I haven't had enough time to experiment with young horses — if you teach the horse for a longer period than I have with [it] you might improve their balance, because they are going to have to figure it out on their own," she says.

For jump schooling, Millar liked the bridle best as a hack-a-bit. "I rigged it with a snaffle in the horse's mouth and the bitless bridle headstall, using two reins. That was very effective. You can use the bitless bridle when the horse wants to argue and get them to simmer down without an argument. Then, if you need to support their balance at the base of the jump, you can use the bit part of the hack-a-bit," she says.

CARLEY SPARKS PHOTO

While horses adapt easily to the bridle, she says it may take riders a little longer. "You ride differently in it than you do with a bit. A less experienced rider probably has to try it a couple of times and get used to how it is different."

Her assessment: "I think mostly it is a fantastic training tool. Horses are really generous, kind animals. If you can show them a way that they are happy to do what you want, they will always do it. When they are being naughty, they usually have a reason. If you show them how easy and fun and comfortable riding is, then they are going to enjoy being ridden more and they are going to be better to ride and try harder for you."



Showing the switch-plate changes that occur in the throat (nasopharynx and oropharynx) to configure it for either breathing or swallowing.

paper blows across your path. The horse spooks and you lose your balance. Instinctively, you clutch at the reins and give your horse a painful bang in the mouth. This convinces him that the paper monster is dangerous and he takes off," he says.

"You apply 'the brakes' with an increasingly frantic pull on the reins. The escalating pain now causes your horse to panic. He runs faster and with increasing desperation. Maddened with fear, he's literally 'running blind.' In this state, he may run straight into barbed wire, a ditch, or oncoming traffic. You and your horse may die."

If the bit is removed from the equation — Dr. Cook invented the crossunder bitless bridle precisely for that purpose — the horse will still spook when a piece of paper blows across his path and you will still be unseated and clutch at the reins. But now the horse feels nothing worse than a painless hug of its head.

"He may run a few yards, but then realize that the piece of paper didn't hurt. As he is not in pain from the rein aid, he will listen to your polite request to slow down. The next time he sees wind-blown paper, he will be less anxious," he says.

Bits May Impair Breathing

"A bit is a foreign body in the horse's mouth and stimulates salivation, chewing, movement of the jaw, and swallowing. These are not the responses needed for exercising; they are 'eating' responses. Eating and exercising have mutually opposed priorities. No horse should be asked to do both at the same time," says the professor.

"At liberty, a running horse has a closed mouth, sealed lips, an immobile tongue and jaw, and an empty, relatively dry oral cavity. This 'programs' the throat for rapid breathing. The soft palate switch-plate falls and enlarges the air channel at the expense of the food channel."

A bit, he says, programs the throat for swallowing. "It breaks the lip seal, opens the mouth, admits air, moves tongue and jaw, and triggers salivation. At the level of the throat, all these raise the soft palate and enlarge the food channel at the expense of the air channel, interfering with breathing," explains Dr. Cook.

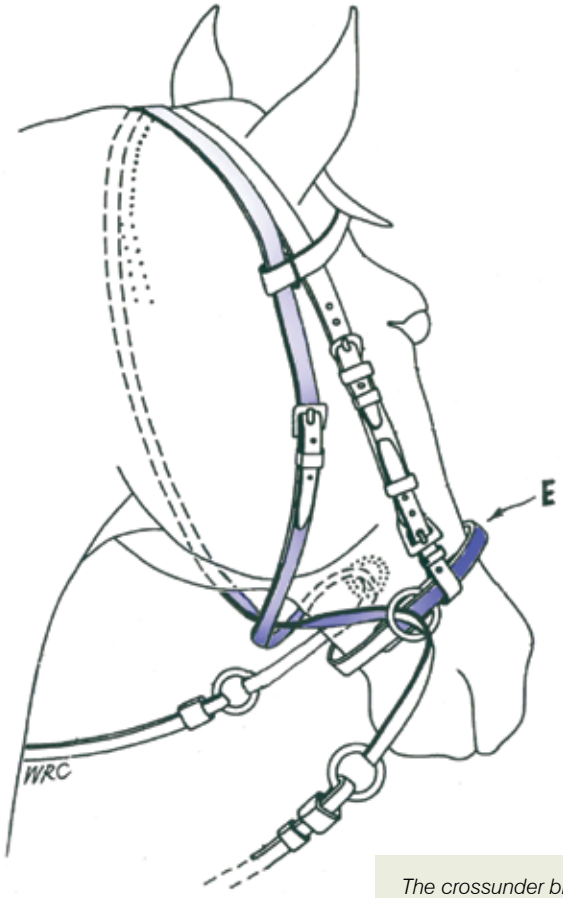
"Use of a bit sends conflicting messages to the horse's brain — to eat or exercise? The confusion is particularly evident in its effect on the soft palate and the horse's wind. A bit disturbs not only the mouth, but also the brain, lungs, legs, heart and circulation — the proper functioning of which are critical to peak performance. In fact, the bit harms just about every bodily system except the reproductive."

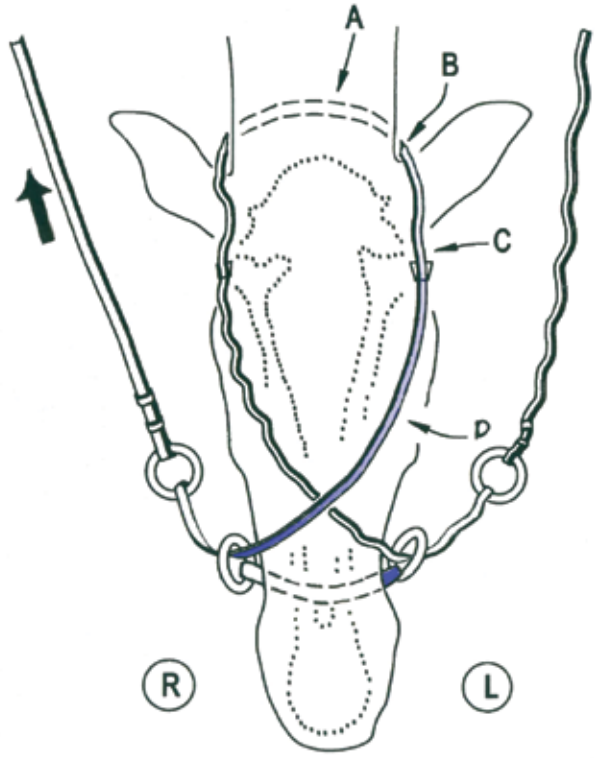
Bits May Interfere With Striding

One consequence of impaired breathing is restricted movement. "The running horse takes one breath for every stride. If the horse can't breathe freely, it can't stride freely. Amazingly, that small piece of mouth metal interferes with the gait and the poetry of motion. You get a choppy gait and stiff movement," says Dr. Cook.

According to Dr. Joyce Harman, DVM, the bit's effect on the tongue may contribute to this stride-shortening effect. Certain muscles in the horse's tongue connect to a small set of bones in the throat called the huoid bones. Originating from these bones are two major neck muscles — one of which attaches to the sternum and the other, to the inside of the shoulder.

"Thus, you have a direct connection from the tongue to the sternum and shoulder. Consequently, if you have tension in the tongue, you have tension all the way down to the sternum and shoulder along the bottom of the neck, where you actually want relaxation," writes Dr. Harman. "Once you have tension to the sternum, the horse cannot raise its back and use the circle of muscles that connect the poll to the tail and travel along the underside of the horse back up to the poll."





The crossunder bitless bridle. The diagram on the right is a view from ground level. To cue for steering, a squeeze of the right rein nudges the left side of the head. The well-distributed and painless pressure of strap on skin is nothing like the focused and painful pressure of steel on bone. Most of the pressure, such as it is, is applied over the bridge of the nose (E), with less pressure under the chin on the left side (D), even less along the left cheek (C) and least of all at the poll (A & B). To cue for slowing or stopping, a squeeze on both reins hugs the entire head.

If the tongue is "free and soft," she says the horse will move more freely and with better coordination. "Horses' strides can lengthen significantly, their balance becomes better and above all they are softer to ride. The only downside is that the rider may have to learn a new way of handling the reins to respond to the new degree of softness," says Dr. Harman.

Bits May Impede Performance

Dr. Cook's work suggests that bits may interfere with the precise purpose they were designed for — performance. "For example, when a show jumper tries to balance her horse a few strides ahead of a jump, bit pain often causes the horse to throw up its head. She distracts her horse at the very moment it needs to focus on the obstacle ahead," says Dr. Cook.

The bit may also be to blame for a horse that rushes its jumps or bolts on landing. "This behavior," he says, "is the horse's way of getting the ordeal over as quickly as possible."

His research indicates an improvement in performance when the bit was removed. In a filmed experiment that Dr. Cook ran at the 2008 Annual Conference of the Certified Horsemanship Association (CHA), four school horses that had never been ridden in a bitless bridle completed two four-minute dressage tests — first in a snaffle bridle, then with the same rider in the crossunder bitless bridle. The horses were ridden by CHA-certified instructors and scored by an independent judge with 25 years' experience.

"The improvement was remarkable. The average score in the bitted bridle was 37%. In the bitless bridle, the average score was 64%," says Dr. Cook. The study was published in the *Equine Veterinary Journal*.

The Final Word

Dr. Cook says all bits are an impediment to performance, welfare, and safety. Others counter that bits don't hurt horses; people's hands hurt horses. Whichever side you lean to, one thing is certain: Dr. Cook's research will make you reconsider the way you think about bits.

(Ed. note: While permissible in show jumping and the cross-country and stadium phases of eventing, FEI rules do not permit the use of bitless bridles in dressage, or the dressage phase of eventing)