PREVENTION OF ACCIDENTS TO RIDERS CAUSED BY TACK: Feel it, log it, fix it.[1]

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The graveyard yawns for the horseman (Arabic Proverb)

ABSTRACT

In the summer of 1995, Christopher Reeve's horse refused at the third jump in a cross-country event. Reeve, wearing both helmet and vest, was pitched forward, landed on his head and broke his neck. Much was written about the accident and Reeve's accomplishments after the accident. Before he died, ten years later, Reeve had done a great deal for quadriplegics in general and for stem cell research in particular. His accident was awful, his paralysis tragic and his work for the disabled heroic. But, as far as I am aware, little or nothing was learnt about the cause of the accident.

Why did Reeve's horse freeze? This was not the first time a horse had refused a jump. What causes this behavior? When this happens, some riders manage to stay in the saddle and some get tossed. Some of the tossed ones get lucky and others die. A recent issue of the UK journal, "Horse and Hound," carries a news item about a 73 year-old foxhunter killed outright in a similar accident.

A number of studies have been published on the cause of riding accidents (Pinchbeck et al, 2004a, 2004b, Murray et al, 2006). These have mostly focused on factors other than the horse, for example, the nature of the track surface in racing and the design of jumps in eventing … what might be called the extrinsic equipment of horse sport.[3] The present article focuses on the intrinsic equipment or, to put it more simply … tack. This is an aspect of horse-related accidents that has not been sufficiently studied. In my experience, the bit, saddle and shoe are major causes of accidents (Table 1). [4]

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[1] Based on a radio program interview for "Animal Talk Naturally," 18th March 2009

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[3] Dr.Linda Lam, a cardiologist in Hong Kong, has contributed a useful medical perspective at http://www.hkcem.com/html/sms/files/Equestrian%20injury_7.3-Linda%20Lam.pdf

[4] There are, of course, many more items of riding tack than these three, for example martingales, tongue straps and special nosebands (flash, grackle and crank). But these are accessories used in an attempt to mask warning signs of trouble caused in the first instance by the bit.

SIGN	BIT	SADDLE	SHOE
fear			
flight			
fight			
freeze			
asphyxia			
'footy'			

Table 1: The six 'F's ... a classification of the main groups of behavioral signs that give warning of tack-induced accidents.
Key: deep blue = common; pale blue = less common but still relevant

With hindsight, it seems that man has done much to make life a misery for the horse (Cook 2008). In the early days, around 3000 BCE, Bronze Age man strapped metal rods in the horse's mouth and sat on his chest. Sometime later (c.200 BCE), he put a cinch around his chest and secured a rigid seat in place. More recently, (c.900 CE), he began to nail iron clamps on the 'toenails' of all four feet. At the same time, stallions were stalled and the practice of confinement began.

The focus in this article is on the welfare of the rider, but in considering this we see that the welfare of the horse is also at risk. A concern for the horse's welfare is not entirely altruistic. A horse in pain is a rider at risk. A frightened horse is an accident waiting to happen. Conversely, a horse that is free of pain and fear is calm and more likely to be compliant, confident and cooperative.

The observations that follow relate to the study of behavior in the ridden and driven horse, as opposed to behavior at liberty. This is an aspect of behavior that has received little attention to date. If the pun can be forgiven, behavior 'under saddle' and 'in harness' has not really been tackled.

In June 2009, the American Horse Council held a national issues forum in Washington DC that focused on the welfare and safety of the horse. Representatives from many segments of the horse industry explained what their associations were doing to respond to the heightened concern about accidents in equine sport. To cite the slogan of the American Association of Equine Practitioners, the forum's aim was to "Put the Horse First." Two of the association's representatives made a passing mention of shoes (the toe grab issue for racehorses) but otherwise, none of the steps being instituted had anything to do with tack. Yet there was no one at the forum that did not agree that equine welfare is a "good idea." So how do we take this overlooked idea about tack and

turn it into action? How do we avoid the danger perceived by T.S Eliot in his truism, "Between the idea and the action falls the shadow"?

One way is to focus on the benefit of the benefits. We all agree that things should be done to benefit the horse but human nature is such that these things are more likely to be done if they also benefit us. A sure way of benefiting the horse and banishing Eliot's shadow is to ask the question, "What's in it for us"? My suggestion is that we should start by putting the rider first.

What can we do to increase the happiness of horsemen and decrease the likelihood of them being injured? My Machiavellian reason for suggesting this approach is based on a principle that has emerged from my work in the last ten years. Any steps we can take to look after our own lives will also significantly improve the quality of life of our horses. Or to put it more bluntly, look after number one and do good by stealth.

This article is literally a chapter of accidents. Both trivial and catastrophic accidents are triggered by tack … by saddles, shoes and bits. Saddles are a necessary evil and if we are to continue riding horses, some sort of saddle is required. Whatever saddle is used must do the least amount of harm. But shoes and bits are unnecessary, contraindicated and counterproductive (Cook1999, Strasser and Kells 2001, Jackson 2002). In the last decade, our understanding of horse management and horsemanship has undergone a paradigm change for the better.

The validity of the advance has been thoroughly tested by horsemen in many disciplines, worldwide. But the majority has not yet become aware of the historic watershed this represents. A first step towards awareness is the armchair approach to education (recommended). For their own safety and for the safety of the horse, riders should also be readers. The present article and its ten-page checklist (Table 3) outlines the evidence but there are many related articles, books, journals and websites that are also relevant. Until riders become aware of the negative behavioral and physical signs caused by tack they will never identify these as warning signs of impending accidents. Without this further education too many problems are either undiscovered or, if they are noted, are falsely attributed to an inherent character flaw on the part of the horse.

Table 2 provides some perspective on the size of the tack problem. At first glance, the shoe appears to be responsible for the least number of negative behavioral signs (c.30). But, as one of those signs is lameness, a simple numerical count underestimates its impact. The same applies to the physical signs caused by shoeing, as two common diseases commonly caused by shoeing are the bane of the horse, navicular syndrome and laminitis. In addition, the many different deformities of the hoof are not individually numbered, so this too underestimates the physical problems caused by shoeing.

Item of TACK	BEHAVIORAL SIGNS	PHYSICAL SIGNS (Defects & diseases)	TOTAL SIGNS
bit	200	40	240
saddle	95	[5]	[100]
shoe	[30]	[6]	[36]

Table 2: An approximate count of the behavioral and physical signs attributed to each item of tack in the checklist, Table 3. *The figures make allowance for some duplication of the same sign under different descriptive terms*
Key: A figure in square brackets indicates that the number is underestimated because a large number of different signs are grouped under an umbrella heading, for example, 'lameness.'

The saddle causes nearly a hundred negative behavioral signs, a handful of diseases and defects, and probably another handful still to be recognized.

The bit causes over 200 behavioral signs, some of which are extremely dangerous (e.g., bolting, bucking and rearing). About half of them are not caused by any other item of tack or any other factor. The bit also causes 40 different diseases and defects.

Physical signs are specific to the item of tack. For example, galls on the withers are not caused by shoes and bone spurs on the bars of the mouth are not caused by saddles.

Common things commonly occur. If I were asked which of the three items of tack most frequently cause problems, I would have to the say the bit. This is not only because the bit causes the greatest number of problems. It also has to do with pain in the mouth, as opposed to back and foot pain, being least well tolerated by the horse. The bit has the most instant effect (acute pain and fear) and the shoe has the most delayed effect (chronic pain and crippling). By avoiding both ends of the spectrum, riding can be made safer and the welfare of the horse improved.

Armchair education may be enough to convince, in which case readers can 'fast forward,' take the 'keep-out-of-hospital' card and make the necessary changes to their tack. In so doing, the risk of learning on the job can be avoided.

Learning 'in the saddle' involves three stages. Stage 1 requires keeping a riding journal. After each ride, you record any negative behavior on the part of your horse that caused you concern or any abnormal physical signs that you observed. After a number of rides, a pattern of behavior will become apparent &/or the physical signs will alert you to the risks that you are running. Stage 2 involves checking this profile against a list of the behavioral and physical signs caused by the three items of tack (Table 3). In this way, you can arrive at a tentative diagnosis about which item of tack is most likely to be

raising the risk of riding. Stage 3 tests this diagnosis by removing or changing the suspected item of tack.

Learning on the job can be described under the three 'P's … predict, prevent and propose. First, you predict accidents by learning to interpret the warning signs. Secondly, you prevent accidents by dispensing with or changing the offending item of tack. Thirdly, if current competition rules do not permit bitless or barefoot participation, you propose a rule change. The three stage approach employs the essence of the scientific method, classification, hypothesis formation and 0 hypothesis testing (Dunbar 1995).

Welfare reform is not necessarily dependent on the need for further research and nor is it always expensive. Many of riding's risks are caused by rules. All that is required to achieve a major advance in the history of horsemanship are some simple rule changes concerning tack. The shoe and the bit are, respectively, medieval and Bronze Age inventions. The only barriers to dispensing with them are current competition rules that mandate their use. These barriers should be removed. Riders in the 21st century should not be obliged to use obsolete technology that heightens the risk of riding and hurts the horse.

Diagnosis of the cause of accidents is the key to their prevention. Treatment of the problem should be based on the only principle that makes any treatment effective - removal of the cause.

COMPARATIVE RISK

These days, the horse is not considered as a means of transport, yet essentially this is what it still provides. How does riding compare with other forms of travel accidents? In order of increasing risk, the least risky is air travel. Lewis Wolpert (2006) writes, *"The actual number of deaths per million kilometers traveled is less than one for airlines and trains, around five for car drivers and passengers, fifty for cyclists, seventy for pedestrians and 100 for motorcyclists. These figures could be misleading as, for example, we walk far fewer kilometers than we fly, so what might be perceived as a greater danger in walking is in fact not."* Wolpert does not comment on equestrian accidents. The total 'mileage' of most horsemen will be relatively small yet accidents are common. The accident-rate per mile is probably quite high.[5]

The risk entailed in riding a horse may be greater than riding a motorbike (Ball et al 2007). Most state laws in the USA require acceptance of the principle that horseback riding is an inherently risky sport. The majority of injuries to horsemen are caused by falls; by being thrown, bucked off, or tipped out. At the time of injury, most horsemen are not actually riding. A jockey is a 37mph projectile, balancing somewhat precariously

[5] Fifteen endurance riders have clocked-up 10,000 miles and one rider 20,000 miles but such achievements are rare.

on a horse that has been urged into a semi-controlled bolt. Outside racing, amateur riders are 20 times more likely to fall than professionals. One in every hundred falls is fatal to the horse. Risk factors mentioned in the literature include rider inexperience, equipment problems and unpredictable horse behavior. Helmets have reduced brain injuries from falls but what can be done to reduce falls in the first instance?

RISK REDUCTION IN OTHER ACTIVITIES

Pilot error used to be a significant cause of plane accidents. In the 1980s this was dramatically reduced by the introduction of two programs, Cockpit Resource Management (CRM) and flight simulators. CRM made better use of the whole team in the cockpit and overcame the diffidence that some members previously showed in disagreeing with the pilot. Problems were spotted more rapidly, acknowledged and resolved, **before** they spiraled out of control. The mantra of CRM is "See It, Say It, Fix It." The subtitle of this article and the thrust of my suggestion for risk reduction in riding and driving is an equine version of this CRM mantra.

The training of pilots was enormously enhanced when flight simulators allowed instructors to generate realistic flight hazards in an artificial cockpit that never left the ground. Pilots could now learn from their mistakes and train their brains to make appropriate high-speed responses when warning lights winked on their dashboards. Each flight, when over, could now be reviewed in an exhaustive debriefing.

Horses don't come with dashboard warnings but they do give warnings. Riders need to recognize these signs, take note and act upon them.[6]

ADVANCES IN NEUROSCIENCE

Apparently, we make decisions in two ways not one (Lehrer, 2009). Since the time of Plato and until very recently, we have prided ourselves on the assumption that we are rational animals and make decisions using the uniquely human part of our brain, the prefrontal cortex. This is a myth. The rational brain is a recent development (a mere 200,000 years old) and it is both deliberate and slow. As has been said, it is like a software program that has been rushed to market. Our rational brain is good for making decisions about relatively simple problems, where there are only two or three factors to consider. For anything more complicated (like buying a house, choosing a wife, riding a bicycle or a horse), we use our emotional brain. This is several hundred million years old. It is fast, effortless and more accurate. It does its thinking based on feelings that have been logged into the brain on the basis of past experience. It makes decisions for us, based on knowledge we have accumulated unaware. Emotions guide us instinctively.

Our emotional (unconscious) brain knows more than we realize, learns from our mistakes and trains our thinking processes. It provides us with feedback (i.e. 'feelings') to help prevent us from repeating these mistakes. For example, let's say that you have

[6] It can be assumed that whatever is written about riding applies also to driving.

been riding the same horse for several years but (so your emotional brain tells you) you are becoming increasingly disenchanted with the pleasure you derive … the pleasure centers of your brain are not being triggered. Your brain notes that you seem to be developing more and more problems as a rider and that riding is becoming increasingly more stressful. A message is sent from your unconscious brain to alert you to this problem. The message is 'apprehension' … riding is less fun than it used to be (so your brain says). Your brain begins to make excuses for not riding. You wonder (you cerebrate) whether to sell the horse and buy another, or you might make up your mind to give up riding altogether. In a nutshell, you are scared. You don't want to admit it to others and you don't even want to admit it to yourself but, every time you think of riding, you feel frightened. Your emotional brain has generated a warning signal … 'butterflies,' sweaty palms and an overactive bladder. At this point, if not before, your horse will also have sensed your fear and will have become even more nervous than before. The vicious circle is made doubly dangerous if you take a death-grip on the bitted reins, hold your breath and clamp your legs around your horse's chest.

By this time, it is already rather late to ask yourself WHY you feel like this, though all is not lost and the question should be asked. The problem was noted by your brain (the WHAT) but you didn't ask WHY and, therefore, didn't resolve the question, "HOW do I deal with this problem?" A better strategy is to start asking yourself such questions much earlier on – at the time when each problem first occurred.

It's rather similar to the situation when a bell and a flashing light on the dashboard of your car alerts you that a seat belt is unfastened. If you ignore the warning, you or your passenger are more at risk than necessary. Most car drivers, of course, take notice of the dashboard warning and correct the problem when it first occurs. As riders, we too should pay attention to our 'in-house' warning system. When our brain documents a problem, we should do something about it. Otherwise, the problem escalates from trivial, to serious, and even fatal. Fortunately, in most cases, the first sign that your horse has a problem does not often result in your sudden death.

RELEVANCE OF A CASE HISTORY

When researchers collect evidence about the cause of riding accidents, they focus, understandably, on the particular circumstances on the day of the accident. This is generally the only evidence they can gather in retrospective studies. More prospective studies are needed of the sort carried out by Pinchbeck et al (2004a), in which evidence was collected **before** the accident. For example, these authors reported that: "Horses that were walking calmly [in the parade ring prior to a race] were less likely to fall than those that were trotting or cantering." They also cite Hutson and Haskell's (1997) study of pre-race behavior and their finding that "winners tended to be more relaxed and losers more aroused."

The use of a case log will help us to predict and, therefore, prevent accidents. For example, during the last ride, did your horse:

- Show any reluctance to work or leave the barn?
- Throw his head in the air?[7]
- Exhibit nervousness?
- Bolt
- Rush his fences
- Refuse a fence[8]

LEARNING FROM EXPERIENCE

When we travel by public transport, we assume that all the necessary precautions have been taken and that the transport company has learned from its mistakes in the past.

But as riders can we be confident that we have learnt from our own experience? How many of us are really conscientious about preflight checks of equipment? Has anyone ever instituted the habit of debriefing? Our emotional brain has been taking note, the evidence is available and we should be making use of it. Horse riding doesn't lend itself to learning with a simulator but, unconsciously, a rider's brain is still being trained on the job. A rider should, I suggest, make a conscious effort to note those 'unconscious' moments of uncertainty, doubt, irritation, frustration, anger or downright fear that occur during a ride. Then, after the ride, research their possible cause against the checklist in Table 3.[9] In this way, a rider can discover how to correct the problem before it gets worse.

Table 3: A diagnostic checklist of behavioral and physical signs caused by tack.

All of the signs cause problems for the rider and many cause accidents. Behavioral signs of pain caused by the bit and saddle are comprehensively listed at the present state of knowledge (additional items will undoubtedly be confirmed with further research). Behavioral signs for the shoe are numerically underestimated, as many have been grouped under the umbrella heading of 'lameness,' as have physical signs under 'hoof defects and deformities.' Physical signs (defects and diseases) caused by the bit are thought to be fairly complete on the basis of current evidence. Physical signs caused by the saddle have probably been underestimated due to lack of evidence.

BEHAVIORAL PROFILING

[7] As it happens, all of the listed incidents – and many more – can be caused by the bit

[8] In his book, "Still Me," Reeve comments that his horse had never previously refused on a cross-country course. He does imply, however, that his horse had been showing some other warning signs prior to the fateful day. The actual signs are not described but apparently they were attributed, rightly or wrongly, to the horse being tender in its back. As a result, Reeve was doing his best to stay off his horse's back, a position he recognized as being more precarious.

[9] The caption only is provided here. Table 3 is a 10-page reference document too large to embed in the text. To access the checklist, click on www.bitlessbridle.com/Accident%20Prevention%20checklist.pdf.

Taking the bit as an example of tack-induced problems, evidence for its negative influence has, in the last ten years, been documented many times by means of behavioral profiling. Using a questionnaire[10] based on behavior before and after switching from a bitted bridle to a crossunder bitless bridle[11] it has been possible to identify many items of bit-induced negative behavior that have never previously been documented. It is common for a bitted horse to exhibit 25 or 30 items of negative behavior and for all of these to be resolved a month later after switching to a crossunder bitless bridle. A few horses exhibit 50 or more problems. Hundreds of riders have completed these behavioral profile questionnaires and thousands more have written about the improvements they have observed in the behavior of their horse as a result of removing the bit.[12]

All the above profiling evidence can, of course, be dismissed as anecdotal but, happily, in 2008, it was possible to conduct an experiment that met the more rigorous requirements for scientific evidence. This is the first time in 5000 years that the efficacy of the bit has been scientifically compared with an alternative rein-aid. A brief description of the experiment follows.

JOINTED SNAFFLE BRIDLE versus CROSSUNDER BITLESS BRIDLE

At the annual conference of the Certified Horsemanship Association (CHA) held at the Kentucky Horse Park in October 2008, I gave a demonstration that took the form of a scientific experiment in front of witnesses (Cook and Mills, 2009). Four volunteers, all of whom were CHA riding instructors, rode four riding-school horses in two standardized exercise tests. The four-minute, exercise test was first completed using a bitted bridle (a jointed snaffle). Immediately afterwards, the same rider/horse partnership repeated the test using a crossunder bitless bridle. Prior to the demonstration, none of the horses had ever been ridden in a crossunder bitless bridle. The horses' behavior and performance were evaluated and recorded on a 64-minute videotape.[13] An independent judge with 25 year's experience scored the tests on a scale from zero to ten, for each of the 27 phases of the test.

The average score when bitted was 37 and, when bitless, 64 … a change in grade from "fairly bad" to "satisfactory." Individual scores improved, from bitted to bitless, in a range from 46% to 109%, with an average improvement of 75%. One of the riders more than doubled her score when bitless and another achieved a 97% improvement. Statistical analysis strongly supported the conclusion that the improvements in performance were not the result of chance. For those that witnessed the experiment it was a revelation that such a significant improvement in performance could be achieved, **in the very first four minutes**, by removing the bit and replacing it with a painless method of communication. The experiment also demonstrated that the transition from bitted to bitless bridle was trouble-free.

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[10] Available online at www.bitlessbridle.com/FOTB-Q.pdf
[11] The BitlessBridle. BitlessBridle Inc. 2000 Nursery Road, Wrightsville, PA 17368 USA
[12] See User Feedback at www.bitlessbridle.com/cat/User+Comments.html
[13] "Bit or Bitless," available at www.bitlessbridle.com.

'FEEL IT, LOG IT, FIX IT' ... HOW DOES IT WORK?

FEEL IT

Here are a few examples of the feelings that your emotional brain might store away.

- You go into the paddock with a halter in your hand and you feel **sad** and a little **irritated** when your horse trots away from you
- In the stable, you feel **frustrated** when you try to bridle your horse and he puts his head in the air
- **Experience** tells you that your horse evades the bit and gapes its mouth, so you **think** you need a dropped noseband
- When mounting, your horse fidgets and **moves away prematurely**
- You **notice** that your horse, so calm when in-hand, becomes nervous and tense when you are in the saddle.
- You **wish** your horse stepped out more freely at the walk and didn't need so much urging
- At transitions from trot to canter, you **learn to expect** your horse will put in a little buck
- After he is warmed up for dressage, your horse begins to toss his head. You **realize** that you have lost contact and **fear** that he might hit you in the face
- You can't **understand** why, during endurance rides, your horse refuses to drink when given the opportunity
- You are a pleasure rider and you **decide** to ride your horse in a covered school because you **don't feel safe** on the trail
- You **recognize** that your horse hates the bit
- You become **nervous** because your horse has started to stumble

The dozen incidents listed above all install negative feelings in your emotional brain. But the list could go on and on, for there are hundreds more (Table 3). As it happens, the presence of a bit is a common explanation for all of the above and the only explanation for at least three. Apart from lip sores and sarcoids around the mouth, the physical signs of bit damage are, like the bit itself, mostly out of sight. Unless a rider is able to examine a horse's mouth, a sign such as a bone spur on the bars of the mouth, erosion of the first cheek tooth in the lower jaw or a scarred tongue will not be detected. But bit damage is not limited to the mouth. The lungs can be damaged because of bit-induced airway obstruction at the level of the throat. Constant pain in the mouth can alter a horse's whole character.

Permanent pain in the horse's foot is its own advocate and cannot be overlooked, as the horse will be lame and cannot be ridden.[14] . But the situation may be different with the early stages of shoe-related problems. Many a horse might develop a poor quality, choppy gait because of discomfort in the feet. We know that shoes cause stumbling in horses that are not overtly lame. When a racehorse "puts a foot wrong" and strains a

[14] As in human medicine, if you want sympathy develop a limp. A disease such as deafness will not do.

tendon or falls, this could be the result of an isolated spasm of pain from a sore shin or unbalanced hoof. Many a shod hoof is deformed, for example, with a long toe, flat sole or high heel. An unbalanced hoof makes a horse clumsy. We know that shoes are the cause of a horse falling on slippery surfaces.

When a horse is lame, a rider correctly suspects pain in the foot. But with many signs caused by the bit a similar and immediate connection to a pain in the mouth is not currently being made. The signs are familiar enough but, paradoxically, their very familiarity explains the lack of proper attribution. The bit is so much a part of every day experience that a host of negative signs that it causes are accepted as 'normal.' *"Oh, yes. My horse always does that – it's a habit of his."* The ability to switch a horse quickly and easily from bit to bitless has exposed these signs as both abnormal and avoidable. So a major step forward in the prevention of accidents is education. Riders have a responsibility to learn how to interpret the signs they are already seeing and feeling. Table 3, dare I say it, is required reading.

For their own safety, riders should be readers about riding. Unfortunately, this is not always the case and, anyway, some of the reading is misleading. Most of us first learn to ride when we are children, long before we have developed the habit of studying books for information. Even if we are lucky enough to learn with the help of a mentor, he or she may or may not be certified to teach. Most riding instructors will focus more on how to use the (traditional) items of tack rather than on whether or not it is even wise to use them in the first place. In my introduction, I mentioned education in the theory of riding as the ideal preliminary to the practice of riding. This might work for someone who does not embark on riding until they are an adult but it doesn't work for the great majority of riders who first 'learn to ride' as children. As with riding a bicycle, we learn how to ride a horse by riding rather than by reading. So learning on the job is the norm for most of us.

LOG IT

Instead of blaming their horse, riders should blame themselves. The most likely explanation for all problems is 'pilot error' … the rider has made a mistake. Remember the horseman's advice, "Riders do not have problem horses, horses have problem riders." We should avoid the temptation to explain any incident by blaming the horse. We humans are the masters of *ad hoc* explanations … our rational brains are quick to generate dismissive and incorrect explanations. For example, "Oh, he's just being an Arab" or, "These off-the-track Thoroughbreds are so highly strung" or, "My poor horse is allergic to pollen" and "He was born with an argumentative character." Diagnosis requires a three-stage procedure.

Stage 1. Paper Trail:

My suggestion is that riders keep a log. Each page of the log could have three columns … 'date,' 'problem' and 'notes.' I encourage riders to develop the habit after each ride of documenting any event that triggered some negative emotion or feeling.

Stage 2. Compare log with checklist Table 3:

Research the possible causes of these problems by crosschecking them against Table 3. A considerable encouragement in finding a solution to a problem is the awareness that a solution exists. Many riders, including myself until I carried out this research, are not aware that the bit can be the cause of so many problems. We have thought of 'aversion to the bit' as being a syndrome with about six or, at the most, 12 symptoms. The knowledge that there are 200 symptoms or more comes as a shock.

There is a difference between cause and correlation. A fall in the barometer correlates with bad weather but it does not cause bad weather. A skeptical reader might be inclined to argue that as a bit is present in most horses how can one be sure that the bit is the real cause of all these problems and not simply an accessory circumstance that just happens to correlate with the negative behavior? A wit might point out that, as all the horses showing these signs also have a tail, one might with equal justification claim that the signs are caused by the tail. Such an argument is refuted in the 'Fix it' stage, when solutions are tested by a process of elimination - by removing the bit, changing the saddle, or instituting barefoot management.

Stage 3. Differential diagnosis:

Some signs are specific (unique) to one item of tack (see Table 3) but many signs are common to two and some are common to all three. Some horses will be exhibiting signs attributable to more than one item of tack. Fortunately, as each horse's log will demonstrate, diagnosis does not rest on one sign only but a collection of signs … typically an extensive collection. A pattern will emerge from the multiple problems you have logged and a tentative diagnosis will be possible.

Because the bit is an extremely common cause of negative behavior there is a high probability that many of the items on a riders log will tally with the column in the checklist marked 'bit' rather than 'saddle' or 'shoe.'

FIX IT

If the problem points to a tentative diagnosis of 'bit' the diagnosis can be tested overnight by switching from bit to bitless and seeing whether there is an immediate improvement in behavior.

Something similar though less dramatic can be demonstrated with a change of saddle or a switch from a treed saddle to a treeless saddle. However, because of the more chronic nature of backache, the improvement in behavior might not be so immediate or as convincing as it is with bit to bitless.

The negative influence of the shoe, real though it is, cannot be demonstrated by immediate behavioral improvement because of the time it takes for the hoof to recover from being shod. In this case, the evidence comes from a gradual return of normal anatomy and physiology, i.e., from the absence of lameness, recovery from disease, and the gradual correction (over many months) of hoof deformities. But the warning signs come from one or more departures from the normal anatomy of the horse's hoof, i.e., the physical signs. So to detect and document the warning, riders need to become more familiar with what a healthy hoof looks like (Strasser and Kells, 2001, Jackson 2002). The shape is not that described in many textbooks. Imagine yourself as a ballerina about to embark on a rather gymnastic pas de deux during which your male partner has to lift you many feet above the ground. Would you feel nervous that you might be dropped if you knew that your partner had two clubbed feet?

As a 'bit' diagnosis will be so common and as it happens to be the easiest and least costly to test, a switch from bit to bitless will often be the first thing to do. A tentative diagnosis of 'bit' can be tested by the response to its removal. Eliminate the bit and see what effect this has on behavior.

If the log list points to 'saddle,' perhaps you can borrow a treeless saddle to test your diagnosis before getting your old saddle re-padded or buying another saddle.

If the log list points to 'shoe,' I recommend that you research the barefoot management programs and take advice from your nearest certified hoof trimmer.

NOT ALL PROBLEMS ARE CAUSED BY TACK

Behavioral problems under saddle can of course be caused by physical defects and diseases unassociated with any item of tack. For example, headshaking may be caused by a cyst in the sinuses or an enlarged corpora nigra in the eye but such causes are rare and bit-induced trigeminal neuralgia is, in my experience, a hugely more likely explanation for this common problem and the first one to be eliminated. As we were told as students, "When you hear the sound of hoofbeats, think horses not zebras."

Similarly, equine protozoal myeloencephalitis (EPM) in the horse can present with signs of stiffness and incoordination but these signs are also consistent with a bit-related problem. As there is no test for EPM that conclusively proves that the signs are caused by EPM and as confirmation of diagnosis by response to therapy for EPM is lengthy and expensive, it makes sense to first eliminate the bit as the cause.

Genetic factors also cause disease. For example, partial or complete paralysis of the voice-box (larynx) can be responsible for an abnormal respiratory noise at exercise in the horse. But this noise can be similar to elevation of the soft palate, which, in my experience, is most commonly caused by the bit, so differentiation becomes necessary. Some of the additional signs on the log may enable you to recognize that the bit is responsible before you submit your horse for soft palate or laryngeal surgery.

Genetic factors undoubtedly influence a horse's character but these are not the only influences. Many riders have been convinced that certain undesirable character traits in their horse were inborn and therefore unchangeable, only to be pleasantly surprised that elimination of the pain of the bit brought about a complete reversal and elimination of these traits and the resurfacing of a thoroughly delightful animal. Similar reformations of cranky horses have been reported when the pain of a saddle was eliminated.

COMPETITION RULES MANDATING BITS AND SHOES

The great majority of riders and drivers ride for pleasure and do not wish to compete, so there is nothing to stop them from using a more humane, effective and painless rein-aid or from instituting a barefoot management program.

But most, national federations and pony clubs adopt FEI guidelines that currently require competitors to use bits and shoes (Fig.1). Racing administrations make the same stipulations. With regard to the bit, the result of the bitless experiment, together with my field experience over the last ten years, provides ample evidence of the need for rule change proposals to be submitted in order that the crossunder bitless bridle, a safer and more humane method of communication than the bit, is made available as an option for competition (Fig.2). The crossunder bitless bridle has been thoroughly tested on horses of all types, temperaments and stages of schooling; by riders of all ages and ability; in nearly every discipline; and under diverse conditions, worldwide. The scientific, humanitarian and practical equestrian reasons for providing such an option are compelling. The option should not be denied on the grounds of tradition. Horsemen now have a better way to communicate with their horse's head (Cook and Strasser, 2003).

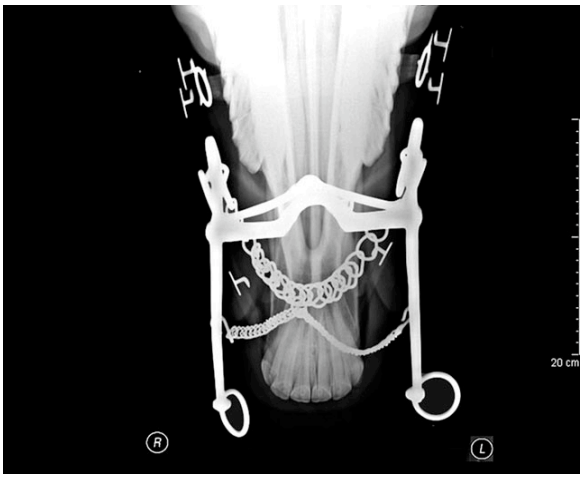

Fig.1a X-ray of a double bridle.

A snaffle bit, a leverage bit and a curb chain are mandated by the FEI for the more advanced levels of dressage, an example that is currently followed by all national federations.(X-ray courtesy of Cummings School of Veterinary Medicine, Tufts University)

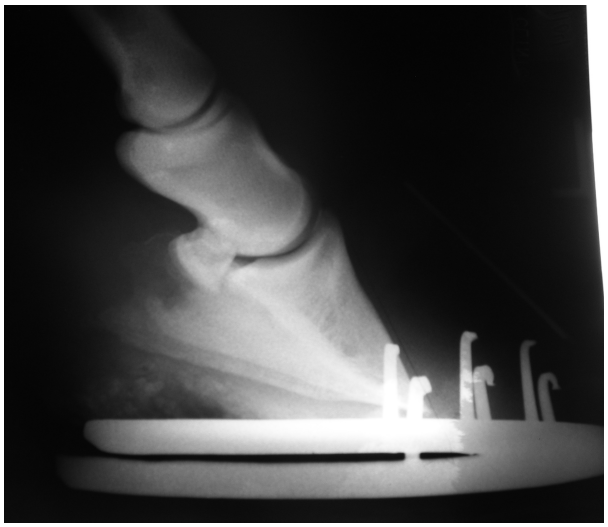

Fig. 1b. X-ray of a shod hoof

This particular foot is deformed as the result of shoeing (the pedal bone is rotated as a sequel to laminitis) but, even if it was a structurally normal hoof it would be incapable of functioning normally because of the presence of a shoe (X-ray courtesy of Claudia Garner).

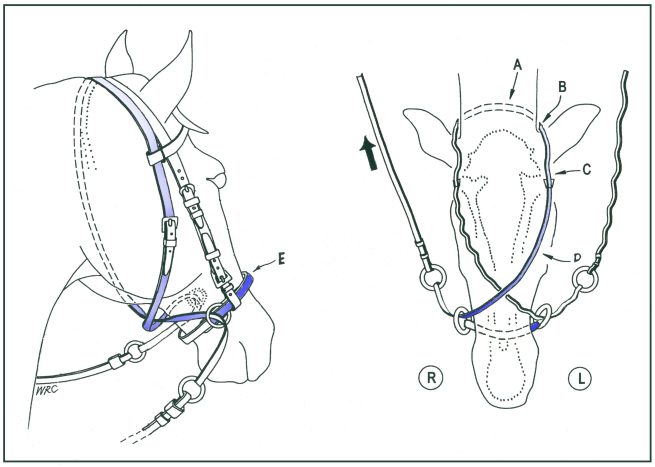

Fig.2. Crossunder bitless bridle.

The diagram on the right shows the underside of the horse's head. For steering, pressure on the right rein (thick arrow) distributes painless pressure over the skin on the left half of the head (thin arrows A-E). A horse responds willingly to the nudge and turns to the right without tilting its head. For slowing or stopping, a bilateral and intermittent rein-aid hugs the whole of the head. A horse interprets this as a polite request to slow or stop. At no point is the pressure anything but gentle. The gradation of color on the crossunder straps and noseband indicates that, such as it is, the pressure is greatest over the bridge of the nose (E); diminishes from chin to cheek (D-C); and is smallest at the poll (B-A)

Rules and regulations that were formulated nearly a hundred years ago (in the case of the FEI) and even earlier (in the case of racing) and which, in all good faith were intended to safeguard the welfare of horse and rider, now act as barriers to advance. They prevent reforms being carried out that would expose the unnecessary risk caused by bits and shoes. We already know that bitless horses are capable of beautiful dressage

performances but until they are permitted to compete under FEI and national federation rules we shall not be able to demonstrate this mathematically. Similarly, current evidence indicates that a bitless racehorse is likely to be not only safer to ride or drive but also healthier and faster. But until bitless racing is permitted, my prediction that bitless racing will significantly reduce the incidence of 'bleeding' and 'choking-up' (exercise-induced pulmonary hemorrhage and dorsal displacement of the soft palate) cannot be verified. Until the rules permit, the cardiovascular and respiratory systems of all racehorses will continue to be stressed by bits that hamper their ability to breathe. Again, on the evidence from anatomy and physiology, barefoot racing is likely to reduce the incidence of sore shins, breakdowns and catastrophic injuries.

Members of pony clubs, national equine federations, the international equine federation (FEI), and administrators of racing are urged to submit the necessary rule change proposals for approval of the crossunder bitless bridle in order that all disciplines can benefit from this historic advance in welfare and safety for horse and rider. The Royal Dutch Equestrian Federation (KNHS) led the way, in 2008, by agreeing to consider approving the crossunder bitless bridle for dressage and for driving competitions. Committee discussions are currently underway and it seems probable that some form of bitless option will be introduced in 2010. The South African National Equine Federation (SANEF) launched a year's trial for separate bitless dressage competitions, starting in 2009. Much suffering, many accidents and a host of diseases could be avoided if other federations would follow their example and introduce this simple administrative reform.

A stroke of the pen could stop the pain.
There is nothing to lose and much to gain

A formal proposal was submitted to the United States Equestrian Federation (USEF) in early 2009 for a rule change to approve the crossunder bitless bridle for dressage. In support of this proposal, two online petitions are collecting signatures and comments. The English language petition currently has over 2000 signatures from all over the world (see http://www.thepetitionsite.com/1/allow-bitless-bridles-in-usef-rated-competitions)

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