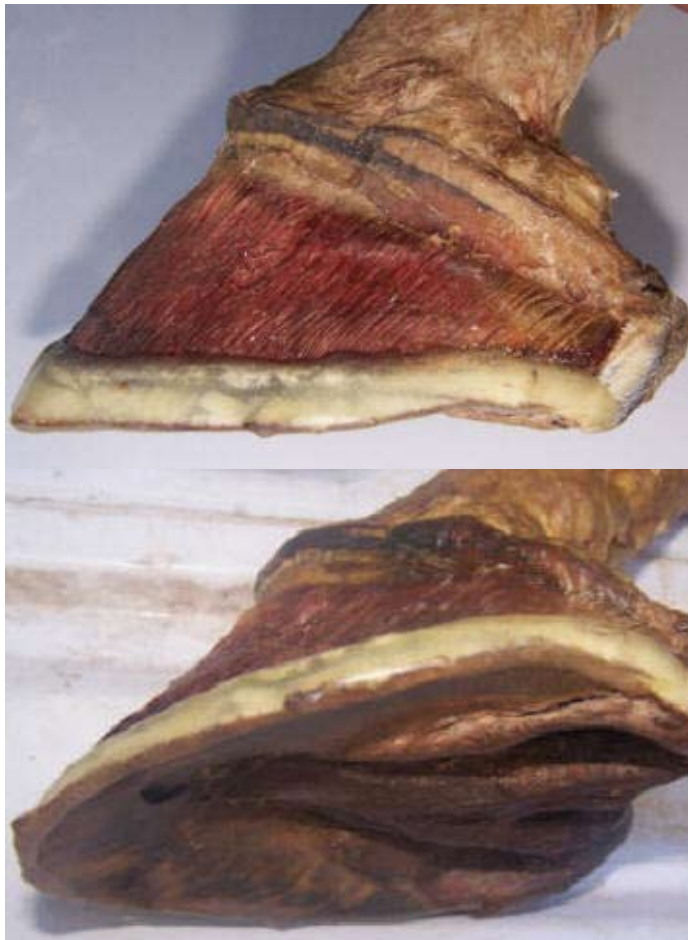


10-25-06 Pete Ramey Copyright 2006

"Please don't twist this article into the thought that excess bar pressure can't do harm. The bars, sole frog and walls each have weight bearing responsibilities and excess pressure to each of them can certainly cause problems... The change in my understanding, thought process and trimming is that the bars 'like' to share more of the load than I previously thought. How much? It varies from case to case; mostly by terrain, health and use of the individual hoof." Pete

"This article works hand-in-hand with the previous article, "One Foot For All Seasons?". The frog and the outer periphery of sole adjacent to the white line should rarely be trimmed on a barefoot horse, but the area in between the two is a very critical and complex issue that varies with terrain, type of work and the health of the hoof."

It is impossible to "hit blood" during a trim if you understand



the shape/function of the internal structures and the critical need for uniform, callused sole thickness.

The coffin bone provides the foundation for the front half of the foot; the lateral cartilages form the foundation for the rear half. In this domestic cadaver, everything that is not directly underneath the coffin bone and lateral cartilages has been removed. This divides the heel buttress down the center. In my opinion, everything left here is designed for vertical support and energy dissipation. Everything I removed is primarily designed for protection from the 'elements' (This includes the outer half of the heel buttress). The outer wall is a critically important shell, but a shell it is.

I see and treat the heel buttress and bar triangle as a 'fork in the road' between supporting wall (the bars) and "armor plating" wall (the outer hoof wall). I think of all the hoof wall material that grows from the bottom of the lateral cartilages as "heel buttress". This includes the bars. It is critical that you never look at a foot that was forged on varied terrain and think of it in terms of mechanical forces while standing square on concrete. The slope of the bars allows expansion, but this expansion should be allowed to "bottom out" for support. This 'new' attitude immediately accelerated my progress with founder cases, or any horse with a "less than perfect" wall connection and/or thin soles.

*Few professionals argue against the principle that vertical flexion of the lateral cartilage is the primary "shock absorber" of the equine foot. Also, everyone seems to agree that the heel buttresses should carry the load in the back of the foot. The inner half of the heel buttress grows directly from the lateral cartilage foundation and so does the bar. **The transition between the two is seamless.** Why would support by the heel buttress be correct, and support by the bars be wrong? They are the same thing. In my opinion the mistake is to take the 'other fork' and think the outer half of the heel buttress and the outer hoof wall are primary in a vertical support role. Does this mean the outer walls have no "weight-bearing" role? NO. A laminitic horse will usually feel much better if pressure on the outer wall (thus the laminae) is relieved, but a horse with sound laminae will be tender-footed if the walls are relieved from pressure. This tells me the walls do have a weight-bearing role; but secondary to the bottom of the foot. In truth, everything that casts a shadow should be working together to support the horse in a healthy situation, with nothing on the bottom of the foot "passive" in a horse's individual environment.*

I am a full time student of the hoof. Those of you who have read my work over the years know that I have been on a constant learning journey along with you. The art of growing and developing a “perfect hoof” that can do its job is too new (actually very old but too forgotten) for anyone to be close to having all the answers. Through it all, I’ve maintained a large number of client horses and have constantly questioned everything I ‘know’ to try to become better for the horses in my care. For the most part I’ve been able to keep an open mind and accept what the horses and their hooves tell me, but sometimes I still have to be dragged “out of the box” kicking and screaming.

The combination of fresh insight from my brother-in-law, Alex Sperandio and spending time with Robert Bowker VMD, PhD has snapped some things into focus for me and formed new insight that is accelerating everything I try to accomplish with hooves. Ivy and I have been carefully researching this privately for quite a while, because we know it will be very surprising and controversial, but the horses like it so much its starting to feel very wrong to keep you in the dark. I just had to be sure it was “right”....

Like most natural hoof care practitioners who learned at the same time I did, I came from a traditional shoeing background, then studied the early works of Jackson and Strasser and took their early insights to the horse, searching for more answers. For years I routinely trimmed the bars and the sole ridge that extends from them (along the frog) to the level and flow of the rest of the natural, callused sole plane without giving it much thought. I saw a great deal of success, but in hindsight only a shadow of what I see now. I was stuck in the thought that pressure to the bar region needed to be reduced and kept to a minimum, even as I constantly said, *“Nature would not and did not put anything on the bottom of the horse that was not intended to bear weight”, and “Nothing is passive on the bottom of the foot in varied terrain; everything that casts a shadow bears weight.”*

I trained Alex Sperandio to trim about seven years ago and he took off on his own; constantly maintaining hundreds of horses. He never learned to shoe and never studied the early barefoot trimming styles. He took a basic foundation I gave him and then mostly learned from the horses. To me he represents “the next generation”; a fresher perspective that is not clouded by so many past mistakes and misunderstandings. I could once justify rasping most of the sole out from under P3 in preparation for a shoe and later in my career I could justify thinning the sole in the back of the foot on barefoot horses for various reasons. *Every “method” I ever studied (shoeing, bare, veterinary...) placed too much priority on measuring heels and toes from the hairline, with little regard to the armor plating on the bottom of the foot. What good are years of experience on thousands of horses when you are doing things wrong?*

The process for the ‘new generation’ of trimmers like Alex is one of learning, rather than the slower, more difficult process I’ve had to do; un-learning. [Alright, I’ll stop beating myself and get on with the story now.] One day, a few years ago, I was looking at pictures of one of

his case studies (a navicular horse) and he had left the bars ½ inch longer than the sole, with a massive ridge of sole running around the apex of the frog. I told him the trim looked great, except that he really needed to shave the bars down closer to the level of the sole plane. He looked me in the eye, set his jaw and in a “ready to do battle tone” asked me, “Why”? I didn’t have an answer. I once thought bar pressure caused navicular disease. Now I believe navicular bone damage or change is actually caused by toe first landing and peripheral loading. I was once taught that bars could become “impacted” into the hoof capsule; dissections and monitoring live horses proved this is not true. I once thought bar pressure caused heel contraction and sensitivity, but the horses taught me otherwise years ago. So I realized it was just my *habit* to always trim the bars to the callused sole height; nothing more. He used my moment of dumfounded silence to add, “The horses come out of shoes much more comfortably this way... I’m just listening to them.” (He knows exactly how to shut me up and make my wheels turn.)

Then he pulled out follow-up pictures of the same foot that showed the bars callused off at 1/16th inch longer than the deeply concaved sole and the foot had de-contracted more than an inch. The ridge of sole around the frog had disappeared (exfoliated) on its own. The bars had not been trimmed along the way and it was an incredibly beautiful transition that only lasted a few months! The horse had remained sound every step of the way and although he had fit the horse in boots the first day, the horse and owner had found no need to use them.

Half of me felt he was off his rocker and the other half of me respects him enough not to dismiss anything he says, so I skeptically watched the results of his ‘renegade long-bar style’ over the next two years on countless horses. Many of his customers are my old clients (I tend to refer maintenance horses to other professionals to make room for my true love; new rehab cases coming in). My ex-customers would have called me at the first hint of trouble, but they have remained happy. Plus it has served Alex’s own rehab cases very well; very consistently. Over time it slowly began to sink into my thick skull; why remove material that is padding the back of the foot when heel-first landing is always our absolute top priority in healing almost every pathology?

Last year I quietly started experimenting with this in my own client horses and immediately found it was a significant improvement to my work. Shod horses come out of shoes much more comfortably if you leave a longer bar and backing off on bar trimming almost immediately and very dramatically increases the soundness and traction of most barefoot horses. The bars will almost always start to maintain their own height at the level of the sole or perhaps an 1/8th to 1/4 inch longer than the sole if you leave them alone. The less you trim the bars, the shorter they become! The flip-side is that the more routinely you trim the bars, the quicker they pop back and ‘need’ to be trimmed again. Leaving a longer bar (and sole ridge around the frog) accelerates the process of achieving a deeply concaved sole by providing support to the internal structures and reducing sole wear. I already learned this lesson about the other parts of the foot years ago. The less I trimmed the sole, the deeper the solar concavity became.



This horse lives on a soft pasture and comfortably works on rocky terrain. Although the walls have been routinely managed, the bars have not been trimmed on this very sound front foot for at least two years. For that matter, neither has the sole or frog. The bottom of the foot has been allowed to find equilibrium in its growth rate. Remember that when a horse puts out 'excess' growth it is trying to recover from something..... Be sure it is not your trim!

The less I shortened the foot, the shorter the foot became. The less I trimmed frogs, the more sound the horses were..... Every time I have learned to back off, my horses became more sound and the rehabilitation of pathologies accomplished more quickly. I was a just a bit slower in seeing the same truth about the bars. Now I've come to view them as a critically important weight-bearing structure and see that as with every other part of the foot, over-trimming them makes them grow too long; too fast.

A basic guideline I'm starting to embrace is this: If more than 1/8th inch of any part of the foot 'needs' to be removed at a four week maintenance trim, that spot was over-trimmed at the last visit. Not by any expert's standard, but by the horse's standard in its given terrain and given the current health of the internal structures (the horse will work overtime to replace needed material if it is removed). This is a strong statement, I know, but I'm learning to trust it more every day. How do you apply this? Not by just leaving all of the excess, but by always leaving anything that 'pops back' an 1/8th inch longer than you did at the last trim. You'll be amazed as you watch the excess growth immediately slow down; the hooves will move towards self-maintenance.

What is "the right" bar length? As discussed at length in the previous article "One Foot For All Seasons?" it varies dramatically with terrain. The bars need enough relief (solar concavity or slope from the heels) that they can descend and the hoof can expand, but more importantly, they need to be in place to "bottom out" to provide vertical support at peak impact loads. On hard, flat terrain, a 1/4 inch taper from the heel buttress to the end of the bar might be perfect. On rocky terrain, much more taper or concavity may be necessary. On soft arena footing the

same goals and support ratio may require a bar to be longer than the hoof walls. Severely foundered horses; particularly "sinkers" often love to have all or most of their weight carried by the bars..... I wish it were easier, but honestly listening to the hoof will take you to the right place.

Now enter the latest research from Dr. Bowker. He and his team at MSU have discovered that much of the sole material is actually being produced from the bar laminae and migrates outward toward the white line. This is something we should have noticed in the field. Have you ever seen a hole in the sole that was made by someone trying to dig for an abscess or drain a puncture wound? Did it fill back in with new sole material? No, it eventually migrated forward and out the front, didn't it?! **The results of the studies are not complete; the research is currently ongoing**, but it appears that the relatively little of the total mass of the sole is actually being produced from the outer perimeter of the sole's corium; just enough to help move the greater mass of sole coming from the bar laminae along in its journey to the outer periphery.

This brings up some very important things to understand when trying to help hooves recover from various pathologies. The same structures (bar laminae) are responsible for producing both bar material and much of the entire sole of the horse. If the horse is constantly working to replace bar material you are trimming away, it can probably reduce the ability to build sole that would eventually be positioned under the toe! This is why it is important to try to achieve self-maintaining bars by leaving them 'a bit too long' and thus slowing down their rate of growth. I believe it 'frees up' the bar laminae to send a larger amount of sole out to the distal border of P3. [Admittedly, this has been difficult to study. If you do something to a foot and it responds well, you really don't know exactly how the foot would have responded if you had done something different. I can say it seems far more rare for a foot to refuse to build sole at the toe when little or no trimming is done to the bars and sole ridge.]

Secondly, when you see a thin-soled horse with heavy ridges of sole along the frogs and/or wrapping around the apex of the frog, realize this material is not necessarily building upward into 'taller lumps'. Much of the material is traveling outward, on its way to the callus ridge under the distal border of P3 where it is needed most. This is why thin soled horses tend to build these ridges and horses with thick, concaved soles tend not to. The thinned soled horse is working overtime to try to spread sole material toward the white line and these ridges of sole should not be trimmed all the way down, but should be allowed to do their job of vertical support and sole building. Can they inhibit hoof expansion? Not as much as the decreased movement caused by pain from thin soles!

The one part of the foot that can and does replace lost material the quickest and most directly is the area of bar and sole alongside the frog. The growth capacity of this region is incredible and it doesn't have far to go. The bars and the sole ridge that often extends from them (parallel to the frog) is often 'uncontrollable' in its rapid growth; particularly when the laminae are destroyed or compromised in the

wake of laminitis and when the soles under P3 are too thin. Is this an accident? A mistake by nature? Something we should do battle with? I think not. The bars lie directly beneath the lateral cartilages. The are positioned perfectly to transfer impact energy directly to the all-important, flexible foundation of cartilage in the back of the foot.

The sole ridge along the frog (the thickest part of the sole) is positioned perfectly for direct support of the coffin bone in the front half of the foot. The sole's corium is thin in this region, but much thicker in the outer periphery. This allows for expansion of the front half of the foot as P3 compresses the thick cushion of blood in its outer periphery (between the distal border of P3 and the sole). For years, I have felt that the sole is the primary weight-bearing surface of the foot, but the more time I spend with Dr. Bowker, the more strongly I feel the primary natural weight bearing (actually impact bearing) structure for the equine foot is actually the bars! In the healthiest of feet, the frog should start to impact the terrain first, absorbing some energy as it compresses. Then, the heel buttresses and bars should start to hit the ground, transferring more of the impact energy directly into the flexible lateral cartilages. Finally, by the time the sole is starting to transfer impact energy into the coffin bone, most of the impact energy has already been absorbed. More energy is dissipated as the coffin bone loads and compresses the cushion of blood underneath (Bowker '99). By the time the toe walls are finally engaged, most of the impact energy has already been dissipated. Indeed when a healthy hoof hits the ground heel-first there is comparably little energy or vibration left to be absorbed by the rest of the limb and body.

It has been at least ten years since I believed the outer walls were the primary weight-bearing structure. It just doesn't make structural sense for nature to so precariously hang the weight-bearing structure on the side of the coffin bone and lateral cartilages. It seems equally insane to think we should waste so much energy dissipating potential built into the horse by doing anything that could cause the slightest sensitivity in the back of the foot; voluntarily landing toe first, ALL of the energy dissipating features of the foot are completely erased. In all other hooved animals it is well understood that the 'pads' underneath are to support weight and impact energy; the hoof walls are armor plating to protect the internal structures from blow from the side (kicking a rock). Why is it so different for a horse? Only incorrect traditional thought, in my opinion. That said, why were so many of us taught to relieve pressure on the bars? And why have we ignored nature's attempts to rapidly replace the bars when we trim them down to the sole plane? They are the one structure most capable of direct energy transfer into the lateral cartilages. The lateral cartilages are forming the flexible foundation for the back of the foot so they can absorb most of the initial impact energy so the bones, joints, tendons and ligaments are not over-stressed.

In my personal journey, the more I've been willing to load the bars, the quicker I am able to achieve rock-crushing soundness for my clients. That's the less significant news, though. The same attitude



From Alex Sperandeo's files (photo taken just after pulling the shoes, before trimming): This Warmblood has built a tremendous ridge of sole around the frog. The material is attempting to travel to the previously-thinned sole under P3. The walls were mustang-rolled but the bottom of the foot was left alone. The picture below is the same foot; four months later, post trim. The bars or sole were never trimmed, but when adequate sole thickness was achieved at the toe, the 'excess' formation of sole from the bars stopped on it's own. This horse stayed in dressage competition throughout this process; never missing a beat.

Forget everything you 'know' and look at the left photo with a fresh perspective. Can you see that 'excess material' as a repair attempt? This foot has no lamellar integrity and very little sole. Can you see that the horse is trying to support himself and push much-needed protection forward to pad P3? Can you see that expansion mechanics are very much in place? This foot is trying to 'start over'.



about the bars accelerates founder and navicular rehabilitation even more. A radical idea? Perhaps, but try it; it works and you'll see the results almost immediately. Food for thought, "There's no such thing as a good habit!" Think before you cut, and if you trim something away that pops back in two weeks; always know that you made a mistake. You've heard me say that for years; now it seems I'm having to give myself the same advice!



The left picture; front left, post trim the day I pulled the shoes. The lateral bar and heel (left side of photos) was rasped into balance with the medial heel (based on collateral groove depth and callused sole plane; not the distorted hairline). The medial bar was already slightly below the wall and was left alone. I was leaving the heels/bars as long as possible to 'pad' the very sensitive situation in the back of the foot. The horse came out of shoes very comfortably, landing heel first and four weeks later the heels have 'opened up' considerably and although they were never trimmed, the bars are no longer spread across the sole or 'laid over'.

Why? Comfortable heel-first movement. In the past I would have automatically trimmed the bars to the sole plane because they were 'laying on the sole'. In hindsight, this would have reduced comfort in the back of the foot, forced a toe-first impact, and probably slowed down these results and caused a need for hoof boots. Also, if I had trimmed the bars to the sole I would have had an even larger amount of bar material 'to remove' again at the four week trim.

Is it 'prettier' to trim the entire foot down to slick, shiny new material? Yes it is, until you watch the horse move!

Does this mean we should just leave the bars alone? Unfortunately it's not that easy. Like any other part of the foot, excess bar length can cause many problems, so we're still left with our usual "tightrope walk"; always teetering on a very fine line between too aggressive and too conservative. The P3 "penetration" below demonstrates a need for aggressive bar trimming.



Pre and post set-up trim: P3 is lower than any part of the hoof wall and covered with only 3/16th inch of sole. The "golf ball sized" bars are too long to allow function in the back of the foot and are lifting the lateral cartilages too high off the ground, standing P3 on its pointed tip. I reluctantly made the decision to "start over" with the bar length and trimmed them to the callused sole plane. This left full sole thickness under the lateral cartilages; the inadequate sole thickness under P3 was left untouched. The trim dramatically increased the comfort of the horse and accomplished my primary goal; taking him off his tiptoes and allowing heel first impact. Because of this comfort, proper impact and the lack of hard surfaces or rocks in the horse's terrain, I opted to leave the horse bare, rather than using the usual boot/pad package.



Only when I returned did I find out I'd made the right decision about the bars. In 5 1/2 weeks, they didn't "pop back", but callused off at the level of the sole. The hoof wall has grown well beyond P3 and the sole has almost achieved adequate thickness. The horse is very comfortable on his pasture and paddock, but would need boots/pads for riding or rocky terrain. **If the 'excess' bar material had grown back, I would have kicked myself for making a mistake and left them alone at this trim.** At this trim I didn't change the heel height, and left the entire bottom of the foot alone (other than wire brushing); only beveling the hoof walls to continue the growth of a well attached hoof capsule. At this point I am mostly waiting for development of the back of the foot and frog callusing.



How are the bars supposed to be shaped? Let's look back to nature (to the most incredibly sound hooves in the world) with a fresh perspective and truly ask, rather than making demands based on our previous, manmade ideals. As usual, nature tells us, "It depends".

From the files of Thomas Teskey, DVM: "These views are of the right fore of an eight year old quarter horse mare during the rainy 2005 Spring season--she has been untrimmed for the past five years. She lives on extremely rocky terrain when not being kept in for riding/cattle work. Her sole depth and bar length are exactly correct and provide her the protection she needs on the terrain that shaped her hooves. Frog position comes closer to heel height during wet periods when terrain is softer." TT



*Feral front hoof; Montana-
Courtesy Robert Bowker VMD, PhD*

*Australian Brumby (front hoof)-
Jeremy Ford*



From the files of Thomas Teskey, DVM: "These views are of the right fore of a five year old Morab mare taken during the dry Summer season--she has never been trimmed, period. Raised on the same rocky terrain, she performs flawlessly under saddle, with seemingly unnoticeable wear to her hooves after days of riding. Note her massive bar-heel structure providing for extra strength, secure landing and purchase, a frog slightly recessed for its own protection, yet positioned perfectly for support, sensitivity and traction. Her sole is at least half an inch thick, with a good amount of dry material ready to exfoliate as she travels.



Prior Mountain Fronts- Catherine Jones

Hooves can not be made this strong and sound by any amount of expert trimming--they are born only from endless movement, seeking out grasses and browse on rough terrain. Preventing problems from birth pays big dividends. Proper set-up trimming of older or previously shod horses along with pads in boots gets even extreme cases back on the trail...the trimmer should then be "out of a job" if the owner is doing their part. " TT

"These hooves have found equilibrium in their environment and work load. Anything a trimmer might do to the bottom of either of these feet would start a war. The hooves would react with excess growth." PR



Feral front; California; Pete Ramey

Feral hind; California; Pete Ramey



Feral front; Oregon- Courtesy Cheryl Henderson



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