

ESSAY FROM: T.F.M. HEADThe Principles and Practice of Scientific Horse Shoeing.

In this essay I will try to cover various aspects of Surgical and Pathological farriery. I will write this essay assuming it is to be read by people with a high standard of knowledge of farriery, this you will appreciate will make explanation much easier. The anatomy of the leg is a vast subject of its own and I would like to explain this to you orally with the assistance of morbid specimens and sketches etc.. Before I commence I would like to state that a great deal of the following should, and possibly must be, dealt with under Veterinary supervision. Wherever a farrier is working with or under a Vet. he must always realise that the Vet's knowledge and qualifications are superior and not to be contradicted.

LAMINITIS.

Many people think that laminitis is a complaint or disease of the feet, this is not very direct or completely correct as laminitis is the result of abnormalities in the rest of the horse's system. The causes are many, here are some: Sudden harsh strain, due to an unfit animal being given hard work. A brood mare failing to cleanse properly. Gorging of rich high protein foods. (Possibly the most common cause.) e.g. Greedy ponies on lush grazing, especially with a fresh growth of grass.

Gorging, resulting in gastro-enteritis, the mare retaining some of the after-birth, and strain all injure the animal's system. The hormone histamine is released to stimulate the blood supply - white cells or antibodies to fight infection and red cells to nourish and replenish the injured, infected or damaged part. During this time, the animal's temperature rises to 103 to 106 degrees Farenheit. The speed of circulation is increased and a "fever" is present in the animal. The injured or infected parts together with the rest of the animal receive excessive nourishment from the blood. In the foot the horn producing papillae of the coronary band, sensitive sole, sensitive frog are over nourished and excessive and rapid growth of the wall, horny sole and horny frog is soon obvious, as is lameness. This is caused by the over production of horn by the papillae of the sensitive laminae, these being responsible for the secretion of the horny laminae with which they interlock.

The horny and sensitive laminae are "boxed in " by the wall on the outside and the forward surface of the pedal bone. (Please note that the laminae extend the full circumference of the wall internally from bar to bar.)

Therefore the over-production of horn, or excessive growth of horny laminae, has in the normal animal no room, the constriction of the foot restricting the "capacity" of the laminae to the norm. . But it must go somewhere so the anterior surface of the pedal bone and the inner surface of the wall at the toe are subject to considerable pressure, ~~xxxxxxxxxxxxxxxxxxxx~~ thus lameness in the animal. Due to the pressure, the pedal bone starts to "rotate"; the "toe" or anterior edge of the pedal bone presses on the sensitive sole pinching it against the horny sole and adding to the lameness. Similarly, the pressure forces the new growth of wall forward. The animal, due to the pain in the toe of it's foot, tends to walk or stand on it's heels and if the condition is neglected the foot will grow in a "curved" shape, with the animal eventually walking on the bulbs of the heels. Laminitis can be divided into two phases or stages.

ACUTE LAMINITIS. (The treatment must be carried out under Veterinary supervision)

This is the start of the lameness where no pedal rotation or deformity has taken place, the animal is obviously lame on both fore feet (it should be noted that the animal is affected in the fore feet more than the hind feet due possibly to the fact that the average animal carries approximately $\frac{3}{5}$ of its weight on the fore legs) it may well stand with it's hind feet more forward than normal to relieve the weight on it's fore feet. The Vet. will deal with the cause of the fever and probably order that the animal be kept on a low protein diet, in the case of gorging order starvation. He may also inject the animal with an anti-histamine injection. The farrier must take off the animal's shoes if shod, and trim the feet being sure to lower the heels as much as possible and not to remove any sole. Relief for the animal may be found to some extent if the wall at the toe is rasped away from coronary band to toe. Cold water from a hose pipe or standing the animal in a pond or stream will also relieve the pain to a certain extent. The feet will need paring approximately once a fortnight as the attack clears up. When paring or shoeing a laminitic ~~foot~~

foot the angle of the coronary band in relationship to the ground must be observed. Due to the abnormal growth of the foot the coronary band is almost parallel to the ground, which is of course incorrect. Every attempt must be made to trim the foot so that the normal angle is maintained. Often with chronic laminitis the angle of the coronary band is the only guide a farrier may have to balance the foot correctly.

Except where a shoe will give an animal immediate relief I never shoe a lame foot until the phase of lameness is over, this would be the case with acute laminitis, unless the sole required protection.

The type of shoe for acute laminitis can vary tremendously. I have, where the attack has been dealt with immediately and efficiently by the horseman, Vet., and farrier shod with ordinary shoes, possibly slightly seated, and found that the only obvious after effect being a "grass ring" growing down the wall from the coronary band, showing to the experienced eye, some disturbance in the animal's system in the past few months. However, as often the attack is not dealt with immediately, slightly extended horny laminae (or enlarged white line) may be present at the toe, the sole of the animal may have dropped slightly and most certainly would be tender and the frog is often diseased (thrush). I would shoe the foot with a seated shoe, so that the inner edge of the shoe clears the sole, the clip or clips lay on sound foot and the nails small and as few in number as possible, so that damage to what could well be a brittle hoof is minimised. If the animal is not doing a lot of road work and the frog is sufficient to create frog pressure (little improvement will be gained in the foot without frog pressure) I would clean the frog and dress it with a modern antibiotic spray (chloromycetin) or Stockholm tar and shoe with an open heeled shoe, possibly thinned towards the heel to assist the animal's action (this may not be necessary). However if the frog is diminished, or the animal is to return to hard road work, I would dress the foot as before and apply a bar shoe, ensuring frog pressure. Whatever shoe is chosen the heels must be fitted a good length and width as the foot will grow very quickly.

Chronic Laminitis.

This is a much advanced stage following a long attack or several successive attacks. The result is much more exaggerated than acute laminitis, as well as being lame the animal cannot walk properly due to the excessive growth affecting it's action and the rest of it's limb. It is as well to note that I have often thought the owner or person in charge of the animal should be prosecuted or cautioned for neglecting the animal. A Vet. may well order the destruction of the animal.

The horny laminae at the toe is very extended. I have seen it as much as two or three inches long, and may contain infection from foreign bodies it may have picked up. The wall is forced outwards considerably. The quarters of the hoof are stretched, thin and brittle. The heels are long and curved following the toe. The frog, generally, is very diseased and the animal will most certainly walk, or stagger around, on the backs of it's heels and bulbs. The sole may be unexfoliated and possibly have a depth of three or four inches or more. Most of all the pedal bone has rotated extensively and may have pierced the horny sole, if this has happened, I feel that the animal will be of little use ever. N.B. The hind feet will be almost as bad as the fore.

Presuming that the vet. wishes to make an attempt to recover the animal, all the excessive growth of horn must be removed. The toe rasped back nearly to the sensitive laminae from the coronary band down and any infection removed and dressed. Unexfoliated sole must be removed, with great care, so as not to weaken the animal's natural sole, which will be dropped or considerably distorted. The heels must be lowered to try to regain the relative angle of the coronary band to the ground. The frog must be dressed with antibiotic or antiseptic to clear up infection. The animal must be kept in on a deep inedible bed and it's diet restricted. It may not be possible to shoe the animal immediately, as due to the removal of the toe and the stretching of the quarters a firm fixing may not be found for the shoe. The type of shoe I would choose for chronic laminitis is a deep seated, broad in cover, thin heeled bar shoe, with the nails placed to gain a firm hold and with possibly a rolled toe to further assist the animal's action. Deep seated and broad to cover and relieve the sole. Thin heeled, as this is how the animal will wear it's shoe, and this

will also help to gain the correct relative angle of coronary band to the ground. The bar for extra cover on the weak heels, extra wear and to create frog pressure which is essential for the health of the frog, to expand the undoubtedly contracted heels and to promote a healthy circulation in the foot. Laminitis is in my opinion the direct result of ignorance or neglect on the part of the horseman, and prevention is, indeed, good intelligent horsemanship. It must also be noted that an animal, once having been ^{affected} by an attack of laminitis will be more susceptible to subsequent attacks.

SEEDY TOE.

This is an infection or inflammation of the inner part of the wall and possibly the horny laminae. It can be caused by blows, nail binds or grit, which apart from any infection they may cause to the sensitive laminae and corium create an "apparent degeneration" of the horn cells in the immediate area of the injury. If un-checked this will spread up the wall adjacent to the laminae and under the hard dense crust and periople of the wall. In time the wall will show a vertical crack on the outside. The point of the inflammation which generally spreads upwards in an inverted "V" shape may well put pressure or contact onto the sensitive laminae and foot causing lameness. (In more serious cases a tumor may form, as in a keratoma, forcing in time, if neglected, a groove or vertical depression in the pedal bone.) To treat seedy toe, firstly probe the degenerated horn with a clean nail or similar to establish its approximate depth. If the point of inflammation is easily accessible from the solar surface of the foot then remove all the degenerate matter, paying particular attention to the very point of the infection, which must be removed completely. One may find that the sensitive laminae may bleed a little at this point. However, the degenerate horn must be removed. If the seediness is too deep to allow proper access from the bottom, the outer wall must be rasped and pared away to facilitate the proper cleansing of the area. After this the whole area must be dressed with a strong anti-septic or Stockholm tar and plugged with cotton wool or tow.

(I have recently used chloromycetin and similar anti-biotic sprays with great success.) The foot may now be shod. If the "opening" extends any way up the wall, which it most likely will, a clip either side of the opening must be drawn, but both nails and clips must be well away from the affected part or parts. The foot surface of the shoe under the affected part must be "set down" or relieved to lessen any concussion on the affected part. i.e. to form a gap between foot and shoe at this point.

THRUSH.

A vile infection of the frog which can be divided into two parts. Firstly, a rotting of the horny frog in either of the lateral ^{LACUNA} ~~laminae~~ and possibly at the point of the frog. Due to filthy conditions, dirt and disease being allowed to remain in the foot, the horn becomes infected and rots or degenerates . The degenerate matter must be cleaned away and the frog sprayed with a suitable antibiotic or antiseptic(again, I have had much success recently with antibiotic sprays, under Veterinary supervision). The holes or crevices must be plugged with cotton wool or tow and Stockholm tar. The animal must be shod to increase frog pressure and the horseman told of the importance of cleanliness. Further dressings will be necessary until a new growth of frog is obvious.

Secondly, catarh or infection of the sudiporous glands which are found in the median lacuna or cleft of frog. This caused by filth and foreign matter starts as a virilant "pussey" infection, spreading if neglected into the horny frog and between the bulbs of the heels. (I have seen this in an advanced stage, where it must have infected the plantar cushion) This again must be cleaned and dressed with antiseptic or antibiotic and plugged with cotton wool. (with more serious cases of thrush, I would reccomend dressing at least once or twice a day .) The foot must be shod to encourage frog pressure. I have seen a horse with catarh of the sudiporous gland, in a Vet.'s private yard which for the whole of the two years it was there, defied all attempts to clear the disease up, so prompt action must be taken once the disease is found.

The shoes suitable for thrush are any that will stimulate frog pressure; if an ordinary shoe can be used and frog pressure gained, all well and good.

It may be necessary to use a bar shoe and if the frog still does not make contact, a piece of leather may be fixed to the shoe to bring about contact. A "tee" shoe may also be used although I have not found this to be practical with horses working under fast conditions. Again, cleanliness and regular attention to the feet must be brought to the notice of the horseman if the condition is not to re-occur.

RING BONE.

This is the name given to boney deposits or osteitis of the Os Suffraginus and the Os Coronae. Very few "ring bones" completely encircle the Os Suffraginus or Os Coronae although some do. In many cases of the lameness, a lump may appear above or below the pastern joint, or on it, or around it, or indeed completely ossify the joint. (Ankylosis.) They may be as high as the upper part of the Os Suffraginus, or on the lower part of the Os Coronae, (Virtually hidden by the coronary band and the hoof.). They may be large lumps or just roughening of the bone. Ring bones are a "release" of bone cells caused by a rupture of the periostium. This can be done by blows or other external violence, excessive concussion or the unseating of the ligaments attached to the bones, due to twisting, or a sprain or indeed unlevel shoeing. For instance, a horse shod high on the outside and low on the inside would throw strain on the lateral ligament of the coronary joint, unseating it from it's attachment to the Os Suffraginus thus rupturing the periostium and allowing bone cells to "spill" forming a ring bone. If the growth is well up on the Os Suffraginus and does not interfere with the joint, though it is most likely that it will in this case, or the path of the extensor tendons, the animal may only be lame for as long as it takes the inflammation to cease and the rupture of the ligament attachment and the periostium to heal. However, if the growth interferes with the joint or the tendon, the horse will probably be lame for life. It is as well to note that wherever a ring bone formation interferes with either the extensor or flexor tendons or a joint, permanent lameness is almost certain. To what degree varies considerably from case to case. Assuming a horse is sound enough for work with a ring bone, the type of shoe

depends a great deal on the position of the ring bone. If the ring bone is on the anterior surface of the bones, a thin heeled bar shoe should be used as the animal will tend to walk on it's heels, thus trying to relieve the pain from interference with the extensor pedis tendon. If the ring bone is on the posterior surface of the bones the horse will walk on it's toes, trying to relieve the flexor pedis perforans. In this case, a graduated, (thick heeled thin toe) shoe with a rolled toe must be used. In the case of ankylosis or complete ossification of the pastern joint a rocker bar shoe should be used. In the case of an animal which is not worked hard, an open rocker shoe may be used, however, I have my doubts if in this day and age one would be able to use an animal in this state at all.

CLUB FOOT. (FOALS.)

Foals can be born with club feet, but I have found that this is more likely to develop as the animal grows. Perhaps due to lameness for a few days where the foal will carry it's bad foot, perhaps just walking on the toe, or the foot may chip or break at the toe causing the foal to walk on it's toe. The result is that the extensor pedis tendon grows more than the flexor tendon leaving the front of the foot very upright, or indeed perpendicular. In one case the foal did not place it's heel on the ground, whilst in most cases the foot was very "boxy" or club footed,

To treat this the foot must first be prepared level, to accept a shoe and the heels lowered as much as possible. The shoe used should be very light and have a toe prong or swan-neck. The prong goes straight out in front of the shoe at the toe about 1" - 1½" and curves upwards and backwards and falls onto the wall about midway up the foot. In other words, a loop from the toe of the shoe forward and back to the foot. When attached this shoe will throw the foot back onto the heel, and in time the foot and the pastern will regain their correct relative angles. I have not known a foal to require one of these shoes for longer than a month. This shoe is followed by a tip to finalise the job and then with careful trimming to ensure that the heels are kept low enough the animal may return to an un-shod state. N.B. The earlier this is carried out the better, as I have grave doubts about the success of this with older animals.

Club Foot.

