Hippodonomia, or the true structure, laws, and economy, of the horse's foot : also Podophthora, or a ruinous defect in the principle of the common shoe detected; and demonstrated by experiments : with a proposition for a new principle of shoeing, which abundant practice has since confirmed

PODOPHTHORA.

PODOPHTHORA;

OR,

THE DEMONSTRATION OF A PERNICIOUS DEFECT IN THE PRINCIPLE OF THE COMMON SHOE.

The preceding notices of the foot having now placed us in a condition easily to apprehend the results of the following experiments in illustration of the shoeing, previously to entering upon them, we believe it may be well just to remark, that for a period of more than a thousand years has the present mode of shoeing been in use, without the public being at all aware that there was any thing wrong or injurious about it, if it was but properly executed; and though accidents, and unequivocal expressions of suffering accompanied it continually, and were visible to the eye of every one, yet no one ventured to think upon a subject that appeared so abstruse; or if he did, was it likely to be received but with rebuff and insolence: and the mischiefs arising from it were constantly evaded or denied, and were attempted to be overcome in every way but the proper and natural one,—that of *removing the cause,*—which cause also was, to the simple as to the more knowing ones, alike unperceived. And many has been the bribe, bestowed through timid fear and apprehension, to encourage the workman "*to shoe his horse well,*" without the donor at all entertaining any fixed notion of what that "good shoeing" should consist in; for it is lamentably true that the mere labourer in any art may practice it all his life long, and that for centuries he may exercise it without his once entering a single step into

its principles: a bricklayer, for instance, may lay bricks to the day of his death, and his successors in like manner, without ever in the least comprehending one single principle of architecture; but that the events which daily occurred in this art did not awaken men to a sense of something being fundamentally wrong in all this time, is a most surprising fact. For, as we have said, a thousand years have passed over without the true principles of the art being at all discovered, or that there was a gross defect in the very fundamental part of it, and which had been a source of animal suffering and misery, that certainly has no parallel in the world! And it was quite unlikely also any remedy should be found out, whilst the true cause of the evil remained undetected.

For let whatever will be said about these effects being known of the shoe, it is clear, from the readiness with which people consent to have their horses shod at any age, on the first summons of the breaker-in of the horse, that they view the shoe merely as protecting the foot, and are not aware of its insidious effects; nor do they afterwards exhibit the least jealousy or anxiety about it, but would rather, as we often observe, treat the proposition of its removal as a piece of inhumanity.

If what we have stated respecting the nature of the horse's foot be true, the effect of the shoe will be almost presumed without any demonstrative evidence; but as reasoning may easily err, and imagination lead us astray, still the actual experiment, if truly related, will ever stand as plain matter of fact, that can neither err nor be denied; and the course of the experiment will also unfold a variety of matter for reflection respecting the foot, which would not properly attach to any thing we have heretofore noticed. We proceed, therefore, to the consideration of this first experiment on the effects of the shoe, in which the public, as far as they are interested in this important inquiry, and especially myself, are greatly indebted to the obliging conduct of George Hobson, Esq., both in providing the subject, and in allowing the mare on all proper occasions to be brought for exami-

nation, and the prosecution of these experiments; for next in every state to man himself in public utility will be what respects the services and true knowledge of this animal, and how we can best obtain those services, and prolong the period of them.

The assertion, at first, may appear singular to those who have not investigated these matters with a close attention, or viewed the chain of connexion of these things from the beginning of the services of the animal to his final termination at the slaughter-house, through the different periods of his rapidly-destructive course; but is nevertheless true, that the shoeing it is, with its multifarious train of consequences, that for the most part has been the root of so many evils to the horse and to mankind, not only by its immediate operation on the structure of the foot, but by its entailed consequences in the use of him, which is so often rendered unsatisfactory, vexatious, and dangerous through it: and these errors, we may observe, in the management of the feet, are ever visited with unmerited punishment upon the animal himself, in order to do away, if possible, or overcome its effects, by exciting other feelings, though for the most part in vain; and it is principally from this also, that the vehicles for draught are filled with all our best saddle horses, as they cannot longer ride them on account of this tenderness of the feet, and by which, after a most painful and miserable existence, they terminate their lives at a comparatively early stage, often before the half of their natural term is expended, and with an immense loss to the public, setting aside all considerations of humanity, which, for certain reasons, we purposely exclude from this part of our labours.

No inquiry respecting shoeing would at all be necessary if our horses invariably went well, and with a firm and proper step; but the case being remarkably otherwise, an inquiry becomes necessary into the cause of this general defect, that the real cause of the evil being understood, the proper remedy may be sought out.

By many it would be naturally expected, that from Newmarket, where wealth, learning often, and horses, go hand in hand, would proceed

the best intelligence on these subjects; but not one ray of light has ever yet emanated from this school; but we hope, now the barrier is broken down that impeded the course to this knowledge, prospects may brighten, and it may become more productive in this respect. For it is indeed but too true, that knowledge in these affairs is not to be attained by stable cant, or "the motley phrase that defies the matter," but by patient research and labour, as it is in all the other arts and sciences, and by which alone these difficulties and obscurities can be removed. We believe the present jockey-system of knowledge respecting these animals must greatly change before a true system for obtaining the utmost speed of the horse can be attained; and this, we apprehend, will one day be done without the extreme distress that now accompanies it; and certainly great advantages and perfections may be derived at present from the elucidations respecting their feet, already given, and this art is likely soon to become an art that all may understand, in principle and practice.*

We now propose to enter upon the details of this important experiment, by which the nature of shoeing can be illustrated; and for this purpose refer the reader back to pages 20 and 21 for what has been already given respecting it; where it was stated, that a beau-

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* And one thing, we think, is very certain, which is, that their *plate shoe*, as they call it, is not the shoe for a race-horse to do his best in, but has many disadvantages when all the circumstances of the case are taken into consideration, and is an especial folly in wet weather, or where the turf is deep and spungy, and a very uneasy shoe at all times. In pursuing lightness they have lost sight, or not known, other circumstances necessary in a well reasoned horse-shoe for this purpose, that is, taking into view all the circumstances of the case. And as to reasoning, we may plainly see that nothing of the kind has ever been employed upon it, or could have been, under nearly a state of total ignorance of every circumstance attending the question. Extent of surface in the shoe (cover, as it is mistakenly termed) is an unquestionable advantage carried to a certain extent, not only by presenting more bearing surface, but by not sinking in too much: but without much enlarging here on the advantages of this extension of bearing surface, we may refer the reader to the reasoning used in the figure given to the Expansion shoe.—*Description of the Expansion Shoe, 2nd Edit. London*, 1827.

tiful young blood mare, the property of George Hobson, Esq., of Harley Street, Cavendish Square, was sent to my forge to be shod; and this circumstance, I may here observe, happened to take place in a most extraordinary manner, about a week or ten days after my mind had been strongly impressed that it was the shoe itself that occasioned so much mischief, from the nails sticking fast in the iron, and too strongly girting the hoof; and it also occurred shortly after that the truth or falsity of this opinion could be rendered experimentally demonstrable, if a fit subject could be found with a tolerably good natural foot; when in the remarkable manner above-mentioned was presented this mare; for right well I knew the obloquy that would attend the giving forth such an opinion or assertion as this, if the proof were wanting to support it, and that it would most probably do harm also instead of good to the cause it was meant to advance, the cause of this worthy animal, and of that truth that is his right; but which opinion, if established, must one day infallibly produce a great revolution in the practice of shoeing, and lead also to an amelioration of the general treatment of the animal.

In the former edition, the matter of this experiment was often interrupted to bring in details respecting the foot: in this edition these will be nearly excluded, which we hope may contribute to give a greater force to the circumstances of the experiment.

A twelvemonth having elapsed from the taking of the first cast or impression, I was desirous of seeing what change had been effected by these iron measures, and proceeded, June 13, 1805, to take a second cast, being exactly a year and nine days after the application of the shoe. During the whole of this period the shoeing smiths, who were as steady men to the full as any others in their line of employ, were left to the practice of their own art without the smallest interference or controul on my part. They were aware of the cast being taken from the foot, and were not less careful on that account in their attentions in shoeing her. And in *plate* 8 is seen a representation by the same eminent artist, Thomas Milton, (grand-

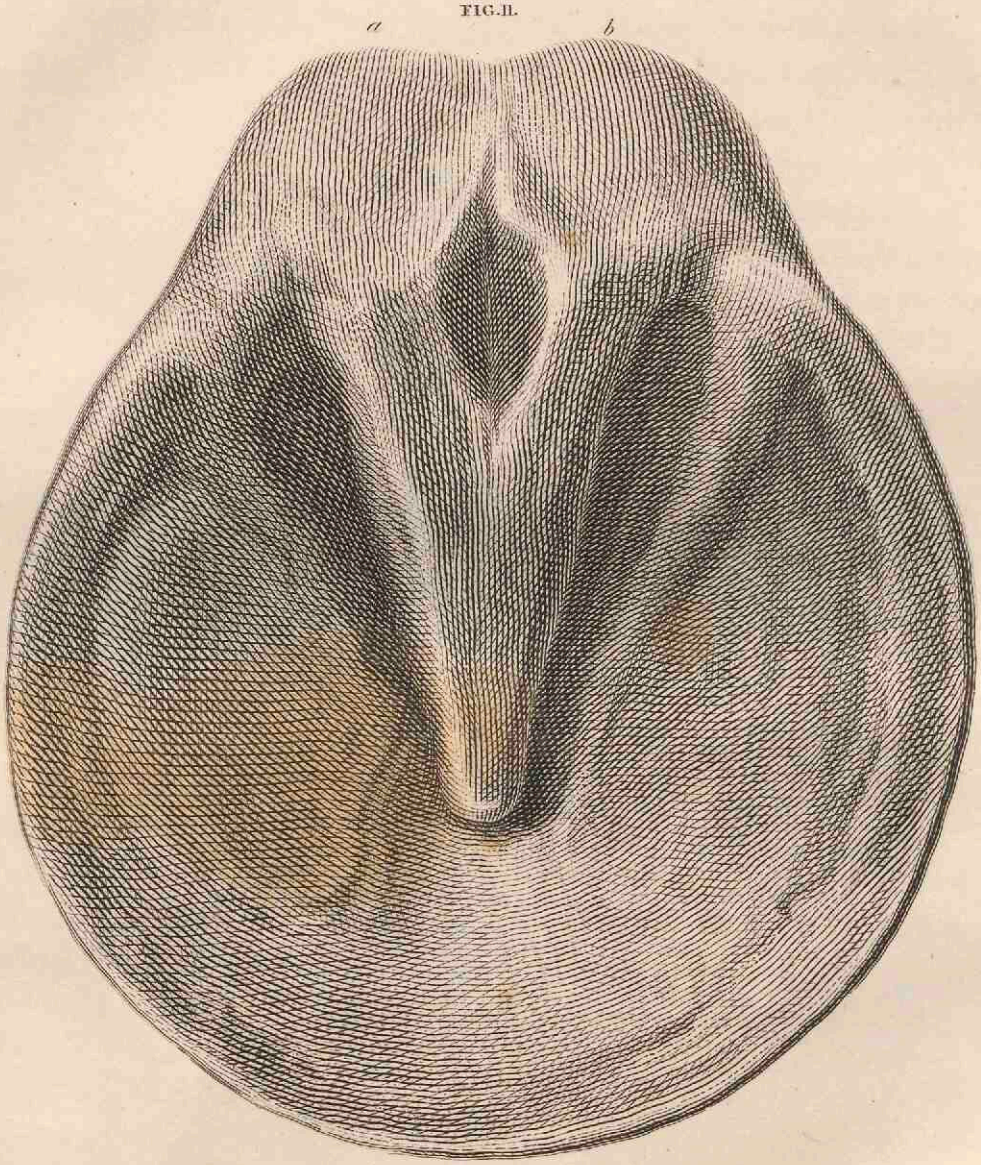
child of our noble Poet's brother,) of the second cast from the foot of this mare.

Let us now mark with precision the differences that have taken place, and see what have been the effects of fixing the foot without intermission, for a period of twelve months, to an inflexible iron ring, for such is briefly the fact with respect to the nature of the shoe, by whatever name it may be called; for the word *shoe* has also had its fascination in concealing its effects, by bringing to our view the comforts we derive from our own shoes made of leather, and elastic to the foot, to which, neither in the material of which it is made, or in the mode of its application, has it the smallest correspondence; of such force are names that mere chance often confers on things in blinding our views of their actual nature.

The original state and proportions of the foot being before us, and perfectly preserved (*vide Frontispiece,* or *Pl.* 1,) we are enabled to make an exact comparison of its former and present condition; a diminution of volume throughout is strikingly manifest, but more so in the elastic parts. A mechanical hardness marks the appearance of it, in place of the flowing, easy outlines observable in the original. The evident competency of the parts to their respective offices, which the eye recognizes in the former, is done away in this; and such is the general diminution of the foot, that actual lameness would naturally be supposed the effect of so much alteration unless explained; for this does not take place for the following reasons; that the parts have suffered their alterations slowly, and, from being in their nature yielding and elastic, have given way to the effect of the shoe, as far as the diminution extends at present, without much resistance; and above all, that during the application of the shoe, the parts that have most suffered are not called into action, nor are their uses required, so that the foot by degrees assumes a new sort of existence, and gradually adapts itself, as much as a living part can do, to the effects of the iron circle, and cannot afterwards well do without it.

We now examine the nature and extent of these changes wrought

FIG. II.



THE SAME FOOT AFTER TWELVE MONTHS SHOEING.

J.d. Edwards Del. Pub. by B. Clark Gilkspur Street January 1. 1810. Milton Sculp.

by the shoe; first observing, that in our drawing away this second impression, we were surprised to find with how much greater force it was held and came away from the foot than the former cast did, and as immediately appeared from certain alterations that had taken place in the relative situation of the parts of the foot, as the slanting surfaces of the bars and frog had now assumed a more perpendicular direction.

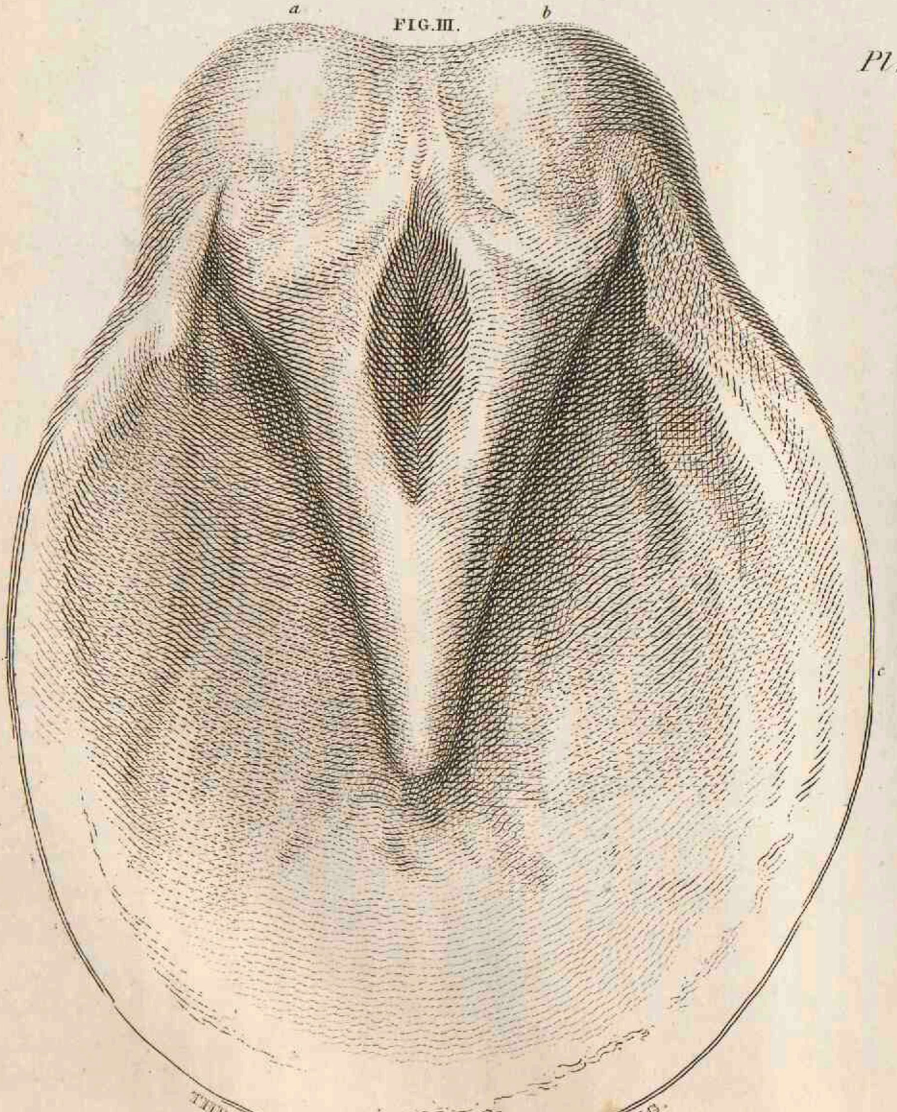
The furch bulbs, *a* and *b*, suffering with the furch, have lost their noble, swelling, rounded, figure and appearance, and the surface they now are seen to present is an ugly, flat slope, towards the base or cleft of this organ. And this has not been the effect altogether of the compressing power of the shoe, but has been occasioned by the senseless cuttings and carvings of the knives of the smiths. And though the representation in the plate does not reach it, it is probably accompanied also with a withering and diminution of the internal bulbs or resilient globes, from the compression of the cartilages, and by condensation or absorption, or both.

The extent or space between the inflexural columns, from one to the other, was, in the original state of the foot, somewhat more than four inches; in the second cast it measured scarcely three. The foot across its widest part, viz., at its greatest swell at the quarters, measured in the original cast nearly five inches and a half; in the second cast, only four inches and seven eighths. The actual length of the foot, we may remark, is not materially changed, which seems to confirm the circumstance, that the cause operating these effects had been lateral principally, and consequently serves to evince its having been chiefly the effect of the nails.

The furch had lost, through its being wasted by compression, and the cuttings of the smiths, the rounded useful swelling and projection we had distinguished by the name of *the Cushion;* and although its substance was so much diminished, still its lower surface was lower by nearly one fourth of an inch than the inflexural columns or wall; for it may be recollected in the account we gave of the furch under

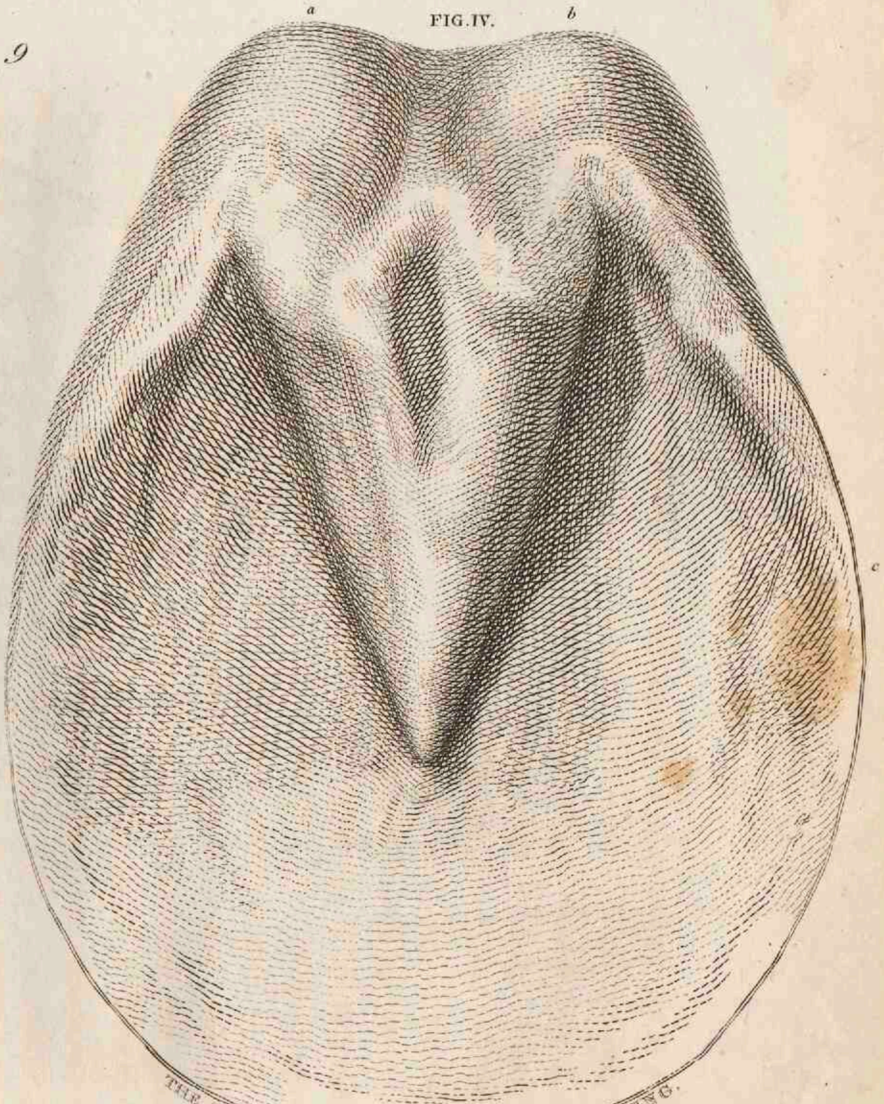
Pl. 9

FIG. III.



THE SAME FOOT AFTER TWO YEARS SHOEING.

FIG. IV.



THE SAME FOOT AFTER THREE YEARS SHOEING.

Sydm. Edwards Del. Pub. by B. Clark. Giltspur Street. Jan. 1 1810. Milton Sculp.

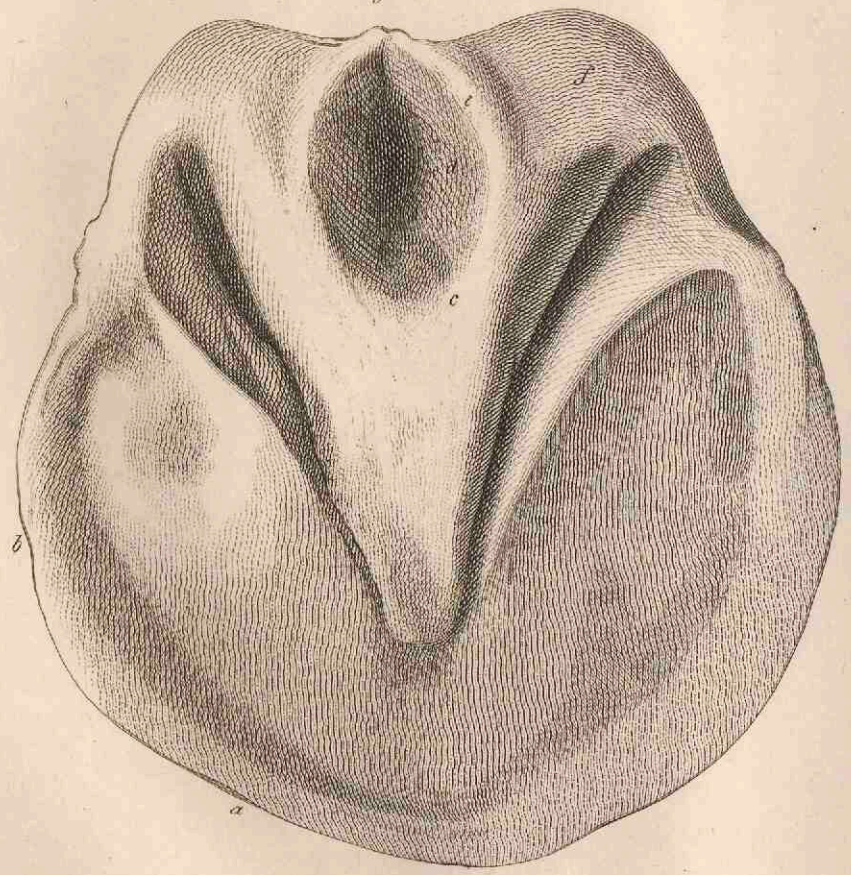
the chapter on Frog-pressure, that this part was then three eighths of an inch higher, or within this level. The sole appeared somewhat more arched or cupped than formerly, but the degree of thickening it had undergone, as also the elasticity it had lost, could not be accurately ascertained in the living subject.

Thus we see the beautiful and useful symmetry of nature's mould, no part of which is without its use, has been changed by artificial restraint to deformity and incompetence. Many there are who have contributed unnecessarily to the obscurity of these cases by confounding them with, or supposing them the effects of standing in the stable, which has served to blind their eyes to the effects of the shoe, and on which account, in a future page, to set things in a more clear light, we shall give proof enough from actual experiment, that however inimical to the feet the stable may be, it is wholly incapable of producing such powerful effects as these, which can be shown most convincingly in two ways, viz., by shoeing, and turning the horse to grass, when the same effects will ensue; and also by keeping a horse unshod in the stable, which we have for years done, when no effects of this kind have taken place. The worst cases of contraction also, we may observe, are with stage horses that have but little opportunity, unfortunately for them, of standing in the stable, being almost continually on the road.

Also our views formerly, on observing these obviously-glaring cases of contraction, were used to be confined to the heels only, and the mischief was attributed, as we have stated, to some natural deficiency of the foot, to *bad shoeing*, as it was called, to bevelling the heels of the shoe too much, or to the want of pressure on the frog, or other causes of this sort; and immediately followed propositions for the futile task of expanding the heels again by frog-pressure, without in the least guessing at the source of the evil; and, with the same intention, the smiths would have recourse to cutting away the arch of the commissure, expecting, vainly enough, that the heels would then *fly* open! but which drying, contracting, and often cracking, served only

Plate 10.

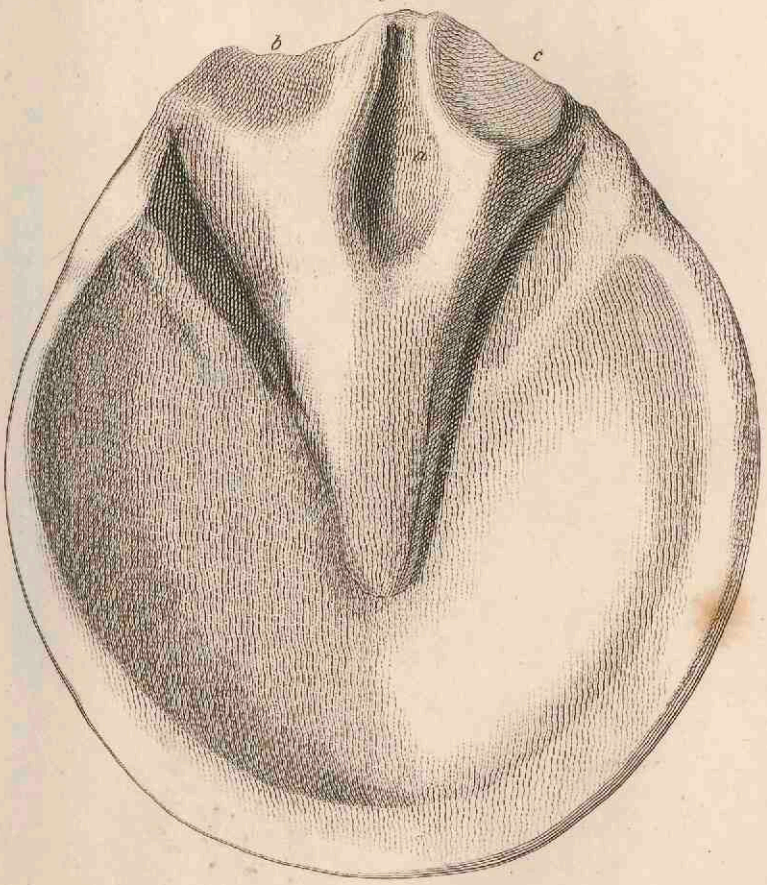
Fig. 1.



Exp.t 2 On the foot of a young grey Mare given 2/3 of its nat.l size — The Furcaceous or frog parts have the ascendency in the Structure of this foot, or are disproport.d large & streng. A. The line of Wear b. the Bulge of the outer Quarter. C the Frog. d. its Cleft. e. Horny margin. f. the Bulbs of f.e frog & foot.

A Lingham Delin.

Fig. 2.



The appearances of the same foot after being Twelvemonths shod, the Mare having been during this time principally kept at Grass. A. The Cleft. extraordinarily diminished b & C. the Heels remarkably sunk.

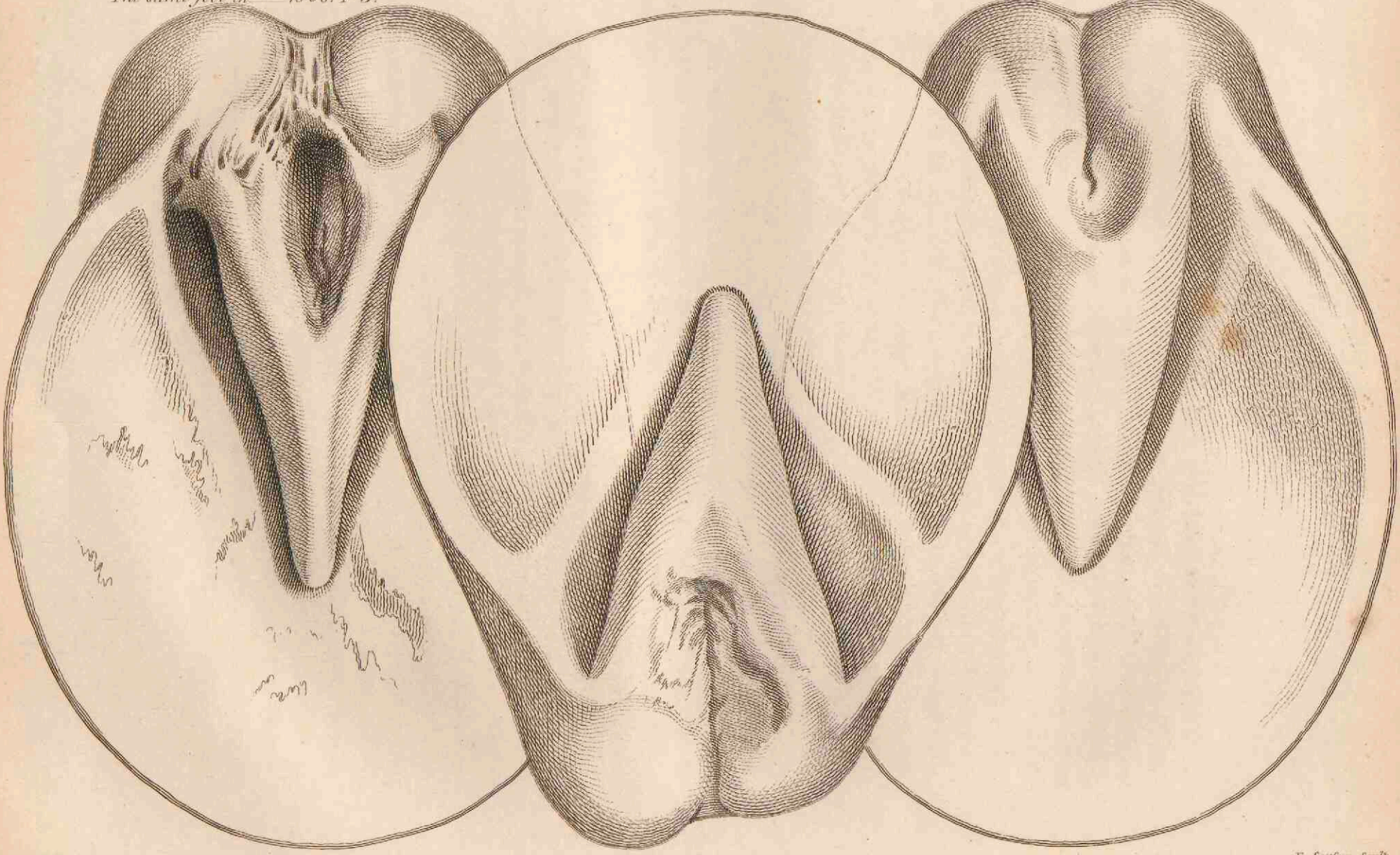
F. Sanson Junr. Sculp.

to increase the mischief,—the attempt at expanding feet so contracted having cost us more attention and expense than almost any other part of our studies and labours respecting the horse, we shall give the general result of them on some future occasion. Indeed it was in making those fruitless attempts that we were first led to see the true nature of the evil; for it is singular, that those views of contracted heels were not at all accompanied with any right apprehension of the true cause and origin of the mischief; that it is very possible to see without perceiving things most obvious, and to perceive and yet not fully understand; so difficult is it to overcome preconceived notions which we doubt not the truth of, or entertain that which our suspicions are not awakened to; and obscure and repulsive are the paths which lead to light.

Seen by itself, there are many now who would deny there was any contraction at all in the foot, *tab.* 8; and more would say it was not of the smallest consequence, because they had been used to see feet much more contracted; and as far as it extends at present, it will not be so much felt as to be made sensible, by external indications at least, while the shoe is used, the animal being patient and courageous in bearing any necessary pain. But that a defect, of an injurious nature to the foot, exists, can be proved even here; for by experiments in similar cases we have found, that by taking off the shoe, and using the foot only a few miles on the road, it will acquire considerable heat, and be inflamed in a way that would not, in the smallest degree, have taken place in the natural foot; and arising, as appears, from a deficiency of the elastic parts of the foot, which by pressure, or want of use, or both, have been condensed or absorbed, and their uses being again called for in this experiment, for the well-being and ease of the foot, painful sensations and inflammation are created by the want of them. For it is not from external resistance, as would at first appear, that this pain arises, for this resistance, it is evident, will be more complete when the shoe is on the foot, but from

Plate. II.

The same foot in 1808. F 5.



in 1809. F 6.

in 1810 7th cast. F 7.

Syd.m Edwards Delin.

F. Sansom Sculp.

efforts at expansion of the different parts of the hoof, which the loss of the elastic parts does not permit.

Five years of unrestrained growth have perfected this foot beyond what is generally seen at the commencement of shoeing, which usually takes place on the second, third, or fourth year of the horse, and before the foot is nearly unfolded or grown to its size; so that the great change that is here observable is more strongly manifested than it would be in ordinary cases of shoeing; and the foot cannot be expected to exhibit differences so great and conspicuous in succeeding years as in the first, there being less of elastic matter to act upon. Nevertheless every year will have its effects, and will bring the hoof in closer approximation to the coffin-bone; and at length we shall see that a partial diminution of the bone itself will be the consequence, with other derangements of its accompanying parts.

The horse, we may remark, like other large animals, is slow in acquiring maturity, and, like them, is not very short-lived. Some celebrated writers have considered the natural period of his life about fifty years. This was before the art of shoeing commenced, and may be not far from the truth in those times. If we were to give an opinion on this matter, we should state it as our belief, that he acquires his *stature or height* at about *five* years, but obtains his full bulk and strength about the *eighth* year; and this period, as in most other animals, if multiplied by four, will give somewhere about the period of his natural life; which, without any desire of unnaturally extending, would be from thirty-two to forty;* and at the former age we have seen (setting aside the state of his feet) horses capable

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* Vivunt annis quidèm quinquagenis: feminæ minori spatio.—*Plin.* lib. 8, c. 42. Gignunt annis ad quadragesimum.—*Plin.*

There is a cart-horse on the canal, near Warrington, 63 years old, to be seen at the Bear in Lutford.—*Liverpool Advertiser.* Also a hunter near Amersham, in Buckinghamshire, 52 years old, that was never out of the gentleman's hands who bred him.

of a great deal of service. But what we wish to remark is, that frequent visits to the slaughter-house, a useful school, but not much frequented, have led us to observe and conclude, that six arrive there before, to one after the fourteenth year! for they so early become cripples through the injuries of their feet, that it is found most advantageous to the interests of those who get these kind of horses that are daily becoming tenderer, to "use them up" by the severest measures, and most unnatural usage, rather than to endeavour to prolong their labours by preserving them; and there is no want of supply through the causes above described, at least principally; and it deserves a closer attention from the public than it has ever yet received; for men, as we have before observed, have been really afraid to look into these things about horses, as though their affairs were somehow clothed in fearful and impenetrable mysteries.

Let us now quit these considerations for a more close view of the nature of the shoe, and how it produces these effects.

The first and most obvious evil of it will be its permanent application and constant pressure against the bottom of the foot, with a force altogether indefinite, depending on the strength with which the nails are clenched, and the proximity of the shoe to the sole, which causes it to act with more or less violence against the lower surface of the coffin bone. Next, the nails in the sides of the hoof, being immoveably blocked in the perforations of the shoe, create a solid resistance of iron at this part, not admitting the natural expansion of the hoof; and it must be obvious that they almost, though not entirely, prevent, by keeping the quarters fixed, every movement of the posterior parts and heels. To obviate this, the nails have been placed as much as may be in the front parts of the foot and shoe, though in reality it was not so much the intention of those who recommended this mode of shoeing, to remove the nails from those parts on this account, as from their being occupied with the mistaken idea of the necessity of pressure on the frog; and to obtain this, the shoe was directed to be made very thin or low at the *heels*, (as in the

shoes of Lafosse and Coleman,) that by the ground meeting the frog, it might force open and expand the *heels;* and the nails were in reality not inserted in the posterior parts of the foot, in order to give an opportunity for this apprehended operation of the frog. In examining the structure and relative situation of the frog, we have seen how little probability there is, that this softer and more retiring part of the foot could be designed by nature for any such office; much less then could it operate with any effect after the nails had in any manner restrained the natural movement and dilatation of the wall. Indeed, the want of success attending all attempts to bring this shoe into actual practice formerly, as well as in these days, sufficiently shows that the doctrine was unsound, though where the defect lay did not before clearly appear.

The feet of horses that have been shod with the low-heeled shoe, we have remarked, have been kept very open by it; yet those who have used it have after a while almost universally abandoned it, preferring the usual methods of shoeing with a level or thick-heeled shoe, nailed along the sides of the foot. This change, we apprehend, they were induced to make from experiencing a degree of sensation and tenderness after much exercise with this sort of shoe; proceeding, perhaps, as might indeed be expected, from the unequal bearing and pressure on the posterior parts of the foot, which such a shoe would inevitably occasion, and also from the strain and distension which the back sinews would suffer from a shoe lowered at the heels; for in order to be indulgent, it ought rather to be raised than lowered, as is the case with our own shoes, the heels of which are always made thicker than any other part, and for the same obvious reason. For with calkins I observe horses almost invariably go the best; and which I was led into the discovery of by turning them up for frost, having been before rather prejudiced against it.

Though subject to the inconveniences above mentioned, a thin-heeled shoe will be perhaps the least injurious to the structure of the horse's foot of any of the rigid nailed shoes; and if applied or adopted

with more correct views than those of producing pressure on the frog, it might perhaps be rendered much more useful than it has ever heretofore been; and particularly to young and growing feet, where it may be resorted to with obvious advantage, if no better means for protecting the foot can be devised.*

Nor are we disposed to attribute the open condition of the foot when this sort of shoe is used, to pressure on the frog; the cause usually assigned, except in a very subordinate degree: we should rather consider it as arising from the opportunity which this sort of shoe affords to the oblique surface of the bars themselves to come in contact with the ground: these, by their structure and direction, sloping downwards and outwards, present interiorly a more solid and proper surface to the ground than the frog, for dilating the posterior parts of the foot. The frog, it will be obvious, also contributes its share, though in an inferior degree, admitting rather of these move-

* To make this sort of shoe answer best the purposes designed, we apprehend it should be made of steel properly tempered, and not of iron, as it may thus be made thinner and lighter, and be even more durable than with iron: it also might, from its thinness, be in part or wholly let into the hoof in front, so as not to disturb the natural course of bearing of the foot on the ground. And as to Lafosse, and all those who followed his frog-squeezing notions, they never arrived beyond this idea, that as the foot was contracted, and apprehending that it proceeded from want of pressure on the frog, they thought that it was necessary to use as much pressure on the frog as possible to prevent it; and the shoe was lowered at the heels for this purpose, that it might operate the better in letting this pressure take place: and it is singular, that satisfied and absorbed in this apprehension of their's, they were never carried to the true source of the evil, nor did this apprehension lead them to a knowledge of the elastic actions or expansive properties of the foot, which is quite a different view of the subject, and leads to different results in the shoeing, viz., to a shoe with a motion, or a removeable shoe, the one which is necessary to the latter doctrine, but which never did in any instance occur to Lafosse, or any of his followers, under the former impressions, proof enough of the difference which, when known and fully understood, to some may appear but small; yet the want of that little difference has been the cause of unspeakable torment to the horses. And the mischief to the horses and to the public that these colleges, as they are called, have done in reviving this stupid old doctrine of Lafosse, is almost incalculable: wherever I go, I still see its abominable effects.

ments than producing them; for we must not be misled by the appearance which this part makes in shod feet, as it always hangs considerably lower than it will be found to do in the full-formed good natural foot. But the preservation of the form of the foot by this kind of shoe, is to be attributed more than to either of these causes, to the almost perfect liberty in which the quarters or sides of the foot are left by the non-insertion of nails into them; the weight of the body then maintaining the movement of the hoof, which will preserve entire the figure of the foot.

This discussion on the shoe is rather a digression from the object of our present inquiry; belonging chiefly to a subsequent chapter of this work, where we shall consider the different shoes, and the reasons of their preference: here we propose alone to consider the cause of the mischievous effects of the shoe.

The nails driven by violent hammering into the square perforations of the shoe, are lodged therein so firmly as to form with it a solid mass, wholly preventing any movement of the hoof at the parts where they enter, and at some distance from them; the quarters being held in this fixed state, the rest of the hoof is also robbed of that motion which is necessary for the healthy existence of the foot: being thus held for months, and even years, in a constrained state, it becomes stiff and inelastic, then diminishes in size, and a train of effects ensue which we shall more fully consider hereafter.

This elastic movement and dilatation of the hoof will admit of being not inaptly exhibited by comparison with the ordinary movements of A BOW for shooting arrows, having under the weight of the animal an evident motion of this kind. Bows also are brought, we believe, from the eastern parts of the world, which are occasionally seen in the museums of the curious, and whose ends or extremities are inflected, or turned inwards towards the centre of the bow, and afford a further illustration of the structure of the wall of the horse's hoof. It is clear also, that if a bow be firmly confined at one or more points along its extremities, it will lose the power of motion,

and become more or less perfectly fixed, as these points are more numerous, or are placed at a greater distance from the centre of the bow. And the nails, by passing through a perfectly inflexible iron ring into the hoof, will make the hoof as inflexible as itself, accompanied with different degrees of restraint, according to the size and figure given to the shoe, or the size of the nails, and the direction which they may have taken in passing through it; which, depending entirely on the judgment of the workman, or rather his simple apprehension, totally unaware as he is of the structure and properties of the organ he is fettering, will be ever liable to great uncertainty and abuse. Nor is he aware, as he adds nail to nail, with violent hammering and clenching, that when he has driven the last, he has circumvented the hoof with a perfectly inelastic barrier of iron, destroying almost entirely any motion it has, for one part cannot well move but in conjunction with the rest; and thus is produced the first part of the evils of shoeing.

The manner of paring the foot, and of bevilling interiorly the upper surface of the shoe, will bring the exterior edge or circumference of the hoof to bear alone against the shoe, and on which the whole weight of the animal will rest, instead of being distributed over a more general bearing. This seems an unavoidable defect in all shoeing of this nature, and which cannot be wholly removed; and this mode of bearing will sometimes occasion, and especially if the hoof be not very strong, a bending in near its middle region, and in other feet producing a contraction of the hoof about the coronet, attended with a miserable feeling, tenderness, and often lameness, and which the French term, *Le pied encastelé*, and for which the English, that I know of, have no proper term. The natural bearing of the hoof on the ground is a very broad and extensive one, embracing several parts of the hoof, and is quite different to this.

Horses also about to be shod are usually led from the dry stable, and in the most dry and hardened state of the foot have the iron applied to them, which cannot afterwards in the least relax. And it

is also true that the shoe is affixed to the foot whilst the foot is off the ground, and free from any weight or pressure, and consequently in its least extended state—a circumstance which greatly tends to augment the evil, and accelerate the contraction.

Nor should it be forgotten, that the nails when driven into the substance of the wall, distend it, like wedges driven into wood.—For it is obvious, that they will always remove a portion of horn from its situation equal in size to the bulk of the nail, the impression of which will be partly lost by condensation of the horn immediately surrounding it, and partly by the dilatation of its substance; which dilatation will take place chiefly towards the inside of the hoof, the horn being more soft and less resisting than on the outside: it is true, this effect of the nail where the hoof is large, as in feet that have not been much diminished or impaired by shoeing, as in the fresh feet of young horses, will not be much felt; but where the hoof by contraction has got into closer approximation to the coffin bone, or in feet that have been trimmed pretty close, or pared small for neatness, or to prevent cutting, or where the hoof has been broken, and there is a necessity for nailing to the broken part, then it will be severely felt, and produce various degrees of compression and tender feeling.

There is in these cases no yielding or power of adaptation in the iron to the foot; that if the shoe be irregular or deformed, it will always draw the horn after it; and if the nail, in being driven by the smith, should bend in its passage through the hoof, which it is very liable to, it will have the effect of compressing the foot. On examining horses' hoofs after death, we have frequently observed ribs of horn running in a perpendicular direction, and bulging towards the inside of the hoof, the obvious effects of nails that had been driven too close, or had bent in their passage: an inconvenience which at times cannot be prevented even by real skill and care.

Again, after the hoof has been pared so as to satisfy the smith, we generally see him make the shoe somewhat less; and after it has

been nailed on, the projecting horn is rasped, or cut away with the knife. This, it has been said, is done to prevent the foot being too large, to prevent cutting, or for neatness: and most certainly it will but too frequently bring a compression to the interior more than it ought to be; and as to the cutting, we have been well satisfied it has on most occasions proceeded from the benumbed state of the foot more than from the size of the shoe, of which we shall give some striking proofs hereafter. And as a further abuse, we may observe, that it frequently happens after the first nail has been driven, that the shoe is violently hammered on the side to bring it into its proper place, and thus compression is conveyed to the foot, and the fine edge of the coffin bone gets damaged—that this evil should also as much as possible be avoided.

Another circumstance unfavourable in the use of the common shoe is, the constant advance of the hoof forward by its growth, by which the narrower parts of the shoe are carried forwards to the wider parts of the foot, and create a degree of compression at these parts: and at times we even see the shoe buried in the horn of the hoof which hangs over it, exhibiting plainly the compression that attends it, for the narrower parts of the shoe are now opposite the wider parts of the hoof.

It is also a truth that cannot be denied, that by shoeing the tender feet of the young and growing horse, which are then enlarging to their form with the other parts of the body, not only the evils arise that would occur to a full-grown foot if shod, but there is a partial arrestation of the growth attends it, with frequent disfiguration also; so that whilst their limbs and body are every where increasing in bulk and weight, their feet, placed in bonds of iron, are diminishing in size and fitness to support and move them.

It is a circumstance certainly of less moment than some of the preceding, although not to be passed over in silence, that the foot, with the shoe placed upon it after the usual custom, is much longer at the toe than the natural foot, creating an unnecessary purchase on

the back sinew, which will tend to embarrass the movements, and strain and fatigue the limb ; for if we attend to the natural hoof, it will be found that this wearing extremity of the hoof on the outside of the toe is short and removed, forming an obtuse, broad, blunt surface, that can occasion no impression or strain on the limb : the shoe, it is true, will, when nearly worn out, assume this figure in some degree ; but we propose that it should possess it on its first application. This suggestion, however, we leave to be determined by future experience.

It is also serious matter of regret, that not only the principle of the art is defective, and especially obnoxious to the young and growing feet, but unfortunately the practice of the art is peculiarly exposed to abuse and accident : being a laborious employment, it is necessarily occupied by men of little or no education, who after a short time become strongly prejudiced with the powers of their art, and their own super-mysterious skill, and, getting into difficulties, commit errors from misconception and a defective knowledge, that makes the practice as much, or more destructive than the principle. A brief enumeration of some of these errors may not be without its use : and preceding writers have inveighed bitterly against the practice of *burning the feet,* and formerly, perhaps, with justice ; but at the present time we do not recollect to have seen much mischief from this source ; and we should apprehend that the evils they experienced, and conceived as arising from this cause, should have been more justly referred to the general principle : in cart-horses, where the growth has been considerable, it saves much trouble to burn away the superfluous horn, though an unsightly, and somewhat dangerous practice ; with nag horses it should never be at all permitted. More frequent injury arises from clumsy and ill-fitted shoes, or shoes made too straight on the sides, or with irregularities and roughness, or pritchel burs, raised in making the holes on their upper bearing surface, that in tender feet may come in contact with the circumference of the sole, or rather that part the smiths call the

vein, a more tender vascular part circumscribing the sole. But the most frequent evil of all is from pricks or stabs of the nails, by their taking a wrong direction; or from the nails, too large, compressing the foot, splitting and tearing the hoof, admitting air into its substance, and drying it. Rasping away the useful cuticular covering of the hoof, we have also already spoken of as an ordinary error, and should not be permitted: and of the ill effects of slicing the frog, and other injurious practices, we have already given our sentiments, and which, as they do not attach necessarily to the principle, may all be removed.

We shall now quit these considerations, to contemplate the effects of the second year's operation of the shoe, which is exhibited in *Plate* 9, *fig.* 3, engraved also from the actual cast of the foot by the same excellent artist. The stiffness and increasing rigidity of the hoof is more strongly manifested than in the last year; the quarters are more straitened, and a further reduction of its bulk of near half an inch has taken place. The cleft of the furch has become narrower and more lengthened; the foot has run out or lengthened at the pince, as though this part, from having no restraint, had increased at the expense, as it were, of the diminishing quarters and heels, being carried out further in extent before the point of the furch. When an impression of the foot was taken, it was always done on the removal of the shoe, and before the foot was pared, that it might appear as natural as possible, and not narrower than was real. And most certain it is, that now the foot can less perfectly serve the designs which a kind Providence proposed in its construction; for where no superfluous or unnecessary part had been given, nothing, it is obvious, could be changed or taken away without some prejudicial effect.

If the hoof be contracted in its diameter, or has become of less area, the softer parts within will be brought into closer contact, or

be absorbed, which condensation, or loss, must be followed by sensations to the animal which it would be difficult to define or ascertain; we should, however, be reasonably led to expect a degree of numbness from the compression, attended with faintness, or a dull, aching pain. An impeded circulation of the foot will be one of the obvious consequences; and whether the elastic processes are not injured by being compressed from a diminished area of the hoof, is not easily ascertained: in very old cases we have thought them paler than the natural ones, and not so broad. That this compression in the latter stages of shoeing is attended with severe suffering (whatever may be the degree of feeling in this stage of the business) is certain, since neither the spur or whip, however severely inflicted, will make the animal for many minutes together put out and use his feet to the full extent of their natural action, or set them fairly to the ground.

If now any thing unsafe or disagreeable begins to be experienced, the rider will be led to suspect that idleness or carelessness is the cause, or weakness of the limbs, or, which is as usual, that the horse is somehow *not well shod;* and finding that chastisement does not long avail, or prevent him from tripping and being tender, and unacquainted with the actual changes which have been going on in the feet, and considering the shoe as a natural and beneficial defence, and not aware of its defective principle, he will attribute his difficulties to a variety of causes, neither of which may be the true one; he may become desirous of investigating and obtaining a knowledge of the shoeing art; its abuses and errors will strongly arrest his attention, nor will the slow and invisible operation of the shoe upon the foot probably become a matter of his observation: seeking information from the grooms, he will perhaps be first recommended to try *good shoeing*, and to have recourse to some more knowing limb of the business, who, "*from practising shoeing all his life, must know the thing well,*" and who will be expected, by some cunning trick or device, to rescue him from his difficulties; but in this he may also be grievously disappointed: harness will probably be recommended to

him as the next resource, and a proper vehicle being provided, his tenderness will be surpassed by measures I shall not here describe; and girded to the bearing rein, and sharply bitted, he is compelled at all events, to perform his allotted work.

Some deviations or exceptions from the general rule. As it is a fact that all horses do not suffer alike, and which has tended greatly to embarrass reasoning, and conceal these effects, so we may state that in horses, where the foot is large, coarse, and the horn very strong, it is not so very much perceived, and the contracting process may go on yet further, and not be much felt, especially by a rider that has been long accustomed to this malady, or has had more tender subjects to deal with; or if his hand and seat be not very sensible to what is passing under him, in which respect there is a surprising difference amongst men; or by assiduous attention to the animal and the ground he passes over, its inconvenience may pass almost disregarded. Also the natural courage of the animal in bearing pain, and which has been slowly induced, and to which he has become accustomed—the fear of punishment—the rewards of delicious food looked for at the end of his labours,—will also all tend to make it the less perceived, and the pride of not admitting a defect shall occasion even the existence of it to be denied where it is obvious.—On the other hand, if the hoof be small, and closely embracing the foot,—the horn thin or very hard, as is particularly the case with blood horses, and if the shoe has been applied early in life, then the evil will be operating in its greatest severity, and at a very early age he becomes a cripple, and is brought to the destructive measures we have mentioned. At five, and even four years old, I have frequently seen horses from this cause incapable of taking more than half steps, and going in the greatest pain and misery, and with difficulty kept on their legs: in tripping he perhaps falls, when it is quaintly said by the grooms that "he has *thrown* his horse down;" or, as sometimes happens, he falls with the groom himself—and then he is "a poor tumble-down devil, not fit to ride;" and

then, " What a shameful thing it is to put a poor fellow on such a *dog-horse*"—that " he is only fit for harness, or in reality the dogs," or that a rolling-stone had caused his fall—though perhaps just before purchased at a high price, and by his own recommendation.—Or still another course of events may occur, and such an accident as the above may have been brought on suddenly by a tight shoe, or a nail driven too close; he may fall in consequence, and be sold on this account: the nail removed, and a shoe better fitted, shall relieve him, and he may pursue the ordinary course of other horses for several years without a similar accident.—Such casual circumstances tend to obscure and embarrass what otherwise would have been almost natural and easy inferences in respect to the feet and shoeing,

Or it may happen in these cases where complaint is made of bad going and tenderness, that the smith will have recourse to the only, or almost only resource he has for giving relief; and this is the operation which he is pleased to call " *throwing open the heels,*" a phrase which mightily fascinates, since it is the very thing that is wanted. For though the expression itself is a mere delusion, yet relief is often obtained by the measure; for it will be clear on inspection, that the heels are not wider after the operation than before, nor are in the way to become so, but a fallacious appearance of width is communicated by the divided parts appearing at a greater distance. This operation, and what we apprehend is the real cause of its relief, is of sufficient importance to deserve a particular description: it is thus performed:

We may observe that the wall of the horse's hoof, at its inflexure or posterior extremity, is projecting to a sharp solid edge or angle of horn, which is turned inwards towards the frog; and in the collapsed or contracted state of the foot, this part resting against the side of the base of the frog, is compressing and almost cutting it: this sharp angle of horn is removed by a slice of the buttress, and, by a second cut, a piece is also removed from the base of the frog, leaving a deep wide notch in these parts; and it is usual to see a deep incision made

into the thick bulbous covering which the frog sends over the inflexural column at its upper part. After this, the sides and bottom of the reverted arch of the frog are most unmercifully sliced away, and without any just reason whatever, as we have before shown in our account of these parts. Indeed the hard horn of the bar might be better spared, as it is the encroaching part, than the soft and more necessary horn of the frog:—next, the sole is miserably thinned with the drawing knife.—And now the effect of all this cutting away is, that the foot is not actually wider than it was before, or likely by these measures to become so; but a temporary release is obtained from the pressure of the encroaching horn, and a degree of elasticity, which is natural to the part, is once more communicated to the foot. And if the shoe is now applied, and adroitly fitted and nailed, a great relief will be experienced, and abundant applause may attend it.

It is, however, only a temporary resource, and will in its consequences, with most feet at least, be ultimately ruinous; for it is obvious that this proceeding does not at all extend to the cause of the evil, without which no permanent advantage can be expected: the horn robbed of its harder, exterior coat, and the interior, more succulent one, exposed, quickly dries, and in drying, contracts, and pinches, or compresses the parts beneath, or perhaps cracks, as is too frequently the case, between the hoof and the inflexion; and the frog also, from frequent cutting, dries and diminishes, and at last separates from its connexion with the bar, and wet and dirt being admitted to the quick, it swells and cankers, and is the forerunner of much suffering and mischief, and renders necessary (from the uncertainty and expense of doctoring, at least by those men who have occasioned it) the wretched policy we have stated of "*working them up.*" The frog also flayed to the quick, a frush is generated by the weakness of the frog-stay, and the frog being frushed, and next cankered, and unfit for its offices,—the animal, no longer capable of work, even by the severest abuse, is led to the slaughter-house, its doors are closed

upon him, and the pole-axe, by removing the object, is ever ready to cancel all errors.

It should ever be the object of the skilful veterinarian to preserve the main frame of the hoof as entire as possible, as in it consists its strength to resist the mischief of closing; and as the foot cannot, when nailed to the shoe, expand outwardly, it will, the more the interior is weakened, close interiorly, that we cannot too forcibly inculcate the necessity of preserving these parts.

It may however happen, and frequently does, that instead of even a temporary relief, the very reverse is experienced; and he who, by his boasted resources, was expected to mend, only makes bad worse, by not understanding the application of all the measures necessary to make it succeed; or the want of success may proceed from the foot being already in a state that does not admit of further relief by such means: whichever way is pursued, it is usually found that, year by year, the horse is becoming on the whole more a cripple, and the owner, either with or without having had accidents, in order to get rid of the evil, and avoid further inconvenience, is induced to part with him.—But with the horse himself, alas! it is otherwise; his diseases cannot be parted with, and at each remove falling into worse hands, and a more base and distressing service, he is at last prematurely destroyed; and this happens most frequently before his bodily powers, that is, if they have been duly supported, are materially impaired, or ought to be so at least, for it is before the half of the natural period of his life is expended.

And although there are feet, it is true, that can withstand the influence of these measures much better than others, and resist them for a longer time, such as a strong, capacious foot, as we have before stated, with a slow, uniform progress of the contraction, and good management in the rider, may prevent his coming to harm, yet in a general way it is undeniably otherwise, and especially with our finest blood-horses, and best horses for the saddle, where the greatest perfection in the provisions and symmetry of the natural foot is observable.

Neither in such situations hitherto has the experience of the rider, however long, afforded him the smallest clue for solving his difficulties, or enabled him to warn others how they might escape the evils he has had to contend with; and the concluslon of many a traveller's tale, after a most aggravating, and perhaps ruinous conflict with these circumstances, has been—"*that horses are by nature troublesome and uncertain things, and are attended with difficulties that are not to be overcome.*" And it is remarkable also, that in the case of these crippled horses, coachmen, smiths, and jockeys will often assume an air of consequence and an affected knowledge, or rather knowingness, about the nature of these evils, though in reality they never could comprehend them or their causes; and, far from shame, take a merit in the very mischiefs and difficulties they themselves have created, without knowing how, though they often know well enough how to turn them to their advantage by recommending a frequent change.

Some, in order to avoid the evils of tender feet, ride furiously over the ground, believing the danger to be greatest in going slow; and though in one sense this may be true, yet the miserable accidents which at times accrue from this expedient, sufficiently exhibit the imprudence of such a dangerous alternative, that it is not by such measures that these evils are to be conquered.

We now propose to consider the third year's experiment on the foot of the mare, which then appeared as represented in *Plate* 9, *fig.* 4, and it will be remarked that the foot is somewhat larger than it was in the year preceding; for in the engraving a rigid adherence was observed to the actual state of the casts. The reason of this unexpected difference we shall now explain.—The possessor of the horse had become somewhat alarmed, and though an experienced

horseman, perhaps for the first time, at the effects of the iron, and the change the foot had undergone, which had been fully explained and pointed out to him, and which induced him in consequence to take off the shoes, and turn the mare to grass without them, doubtless to prevent the further progress of the evil, and to remedy the present defect. The effect of this was, that a degree of fulness and plumpness was communicated to the frog and parts about it, which served for a while to interrupt the regular course of the experiment. And we at one time proposed to turn this circumstance to advantage, in recounting here the curious result of our experiments on the restoration, or proposed restoration, of contracted feet, by this measure of removing the shoes, and turning the horse out; but we shall rather prefer to introduce them under a more advanced stage of the contraction, or in a separate account.

As this unexpected interruption to the experiment prevents any direct conclusions from this year's experiment, we shall in this place state to the reader the interesting result of an experiment on a new subject, which is given in *Plate* 10, *fig.* 1 & 2, made purposely to examine and remove one of the hitherto-apprehended causes involved in this contraction of horses' feet, and tending much to obscure and perplex the notions entertained of this matter; for the influence of the stable has been on most occasions, as may be seen by the writings of my predecessors, thrust in to account for this malady, and cast a ten-fold obscurity in the way of the veterinary profession.

A coarse, ordinary, grey mare, five years old, was purchased for this purpose of Mr. Lush, a distiller in Holborn, who informed me he received her in part of rent from a tenant in the country, and that she had never before, or more than once, been shod, which her feet indeed sufficiently evinced; the form of one of her fore feet is seen in *fig.*1, and the amplitude, and almost exuberant strength of the

furcaceous parts is remarkable.* A cast was made from this mare's foot in Plaster of Paris, from which the engraving was made, and which gives an exact expression of its features. After the cast of the foot had been taken, she was shod, and then turned into a grass field near the village of Peckham, that I might observe if this contraction and hardening of the hoof would take place without any influence of the stable; and the result, after near a twelvemonth, was as seen in *fig.* 2, where the cavities in the furch bulbs, from the loss of elastic matter, and the horn sinking in and following it, are not at all exaggerated, as might perhaps, if not particularly stated, be otherwise apprehended: this more than ordinary diminution, and loss of matter in these parts, will be readily accounted for from the very redundant size and fulness of the softer parts in this foot, as we have just stated in our description of *fig.* 1.

By another experiment also, the converse of this, we are led to a similar conclusion.——At the St. Ives autumn fair of 1808, in Huntingdonshire, I purchased a chesnut mare that had been very little shod, (my express object in this journey being to procure one of three or four years old, that had never been shod, but which I found impossible, so early with us are horses usually shod:) this mare came

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* The horse's hoof appears to receive, or to be imprest in its formation with very different characters, as to the relative proportions of the two leading parts in its composition: in some feet the wall and its continuous parts are particularly strong, with a frog not in the same proportion; in others the frog, with its continuous parts, will be found pre-eminently strong and full, assuming as it were a power at the expense of the wall, which is not stout in proportion.—The frog-stay also, we may remark, in some feet appears large and completed at the third, and in others not till the fourth or fifth year.—Again, the upright or mule-footed horse appears to have a distinct, and almost opposite form and qualities to the low and flat foot, communicating such different properties to the foot, as not only to alter very much its appearance, but greatly to interfere with the regular uniformity of the effects of the shoe. The perfection of the foot of the horse, therefore, would appear to consist in a symmetrically-distributed and duly mingled power of each of the above parts.

the nearest to my purpose of any I could find; and I learnt afterwards that she had been vicious in breaking in, and had been turned out to grass for a twelvemonth without shoes, that she might forget her vicious habits, and the ill treatment she had received.

I purchased her, and led her from St. Ives to Huntingdon, to my friend Mr. Baumgartner's, who kindly interested himself in assisting me in obtaining her; and thence to London. By gentle treatment she in time forgot her fears and vicious habits, and I continued to make her the subject of all my experiments on a new mode of shoeing; and during the whole of this time she stood exposed in every respect as horses at livery are to the litter and dung of the stable without shoes; and though so situated, her feet grew both larger and rounder instead of diminishing, as would have been the case had they been confined by the iron. And that I might more accurately ascertain the truth of this, I took occasional casts in plaster of Paris, but have not deemed them of importance sufficient to deserve being engraved for the work.

That the stable is in no way ever inimical to the feet of Horses it is not our intention by any means to assert; but we are only desirous of exhibiting proof, that alone it is not sufficient to induce the contraction that has been apprehended.

It may be urged that feet often contract in the stable, and without shoes: this we readily admit; but its explanation appears to be that a disposition to contraction has been previously brought on by the shoeing, and which afterwards can proceed without the operation or continuance of the original cause.

Having brought greater clearness into our views by the removal of this generally-apprehended source of contraction, we can now, with more unclouded views, return to a consideration of what the original experiment unfolds respecting feet.

Let us now consider the well-marked cast of the year 1808: we have contrived to have that of 1809 and 1810 represented on the same plate—the dotted lines serving to exhibit the otherwise concealed outlines of one side of each of the two last feet.

The area of the foot in its transverse diameter is seen further diminishing, and the condition into which the preceding reduction has brought the foot will occasion lesser degrees of this change to be now more severely felt. The horn is every where in more close embrace to the sides and posterior parts of the foot; and the horny sole thickened, and almost inactive, is creating a resistance to the internal foot also in this direction, and with the general want of elasticity, will occasion the movement of the bones within the hoof, and of the hoof itself, to be diminished and constrained; the vascular organization also, which is uniting and attaching the hoof and bone together, has also become diminished, and their functions impaired, and has thus prepared the way for *Founder*, and other morbid affections of the foot allied to this disease.

In very upright feet, where the inflexions are lofty, the bars, as the mischief advances, approach the frog, and nearly close upon it, and embrace it almost from top to bottom, as may be seen in the foot represented in *Plate 3, fig. 3*, and by their irritation and compression is quickly generated the running frush, and which in such feet is with more difficulty also got rid of.

That the word *Founder** may be clearly understood,—for the term has been strangely misapprehended and misapplied by the college,† and through their teachings vaguely used to signify simple con-

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* As the ship at sea founders, or sinks into the waves, so in this disease does the bone sink down in the hoof: but the term is probably immediately obtained by us from the old French, *morfondre*.

† So little aware was Coleman of what constituted this disorder, that till lately he confounded it with simple contraction, and evidently did not understand the distinction, which can easily be shown by his works, as also by his lectures, manuscript copies of which are scattered about the country.

traction, or any affection which prevented the proper going of the horse,—that, from seeing this abuse, we are the more induced to give a brief description of this very distinct and peculiar disease of the foot, that there may be no longer any misrepresentations or obscurity about it; for, taking advantage of this state of things, they have made their boasts of pretended cases, which, to look the more wonderful, were stated to be of *foundered* feet, though in reality they had only given a state of insensibility to badly-contracted feet by the vile barbarity of cutting out the nerves of the leg.

A description of true Founder. The foot of the horse not unfrequently has its connexion with the hoof, weakened or wholly detached. The coffin bone in this case dislodged, or its adherence impaired, is pressed down by the natural operation of the weight of the body, and sinking till it meets the sole, it there rests, with its front parts bearing on the front parts of the horn of the sole, forcing it downwards, and sometimes outwards, in such a way that this part, from being naturally concave, becomes of a flat or a convex form. The horse is then truly enough said to be *foundered* or *pomme-footed.**

* From *pomme*, (Fr.) an apple—not *pomet*, *pomed*, or *pumice*, as we often see it written.—One writer has endeavoured to make the "*pumiced foot*," as he calls it, a distinct disorder from founder, but certainly erroneously, since the state of the hoof he so designates and describes is neither more nor less than the foundered foot after a considerable lapse of time, the hoof then assuming that thick appearance. (*See Stereoplea, pl.* 1, *fig* .4.

To afford a name, and of a cast somewhat more classical for professional use than the one vulgarly employed, I formerly ventured, in some lectures I gave on these subjects, to arrange the different appearances or modifications of this complaint, and its congeners, under the following heads or divisions :—

Pedicida, or *The Perfect Founder*, where the disease was complete, that is, with a total detachment of the coffin bone, and a perfect subsidence and resting of it upon the horny sole. (*Stereop., pl.* 1. *f.* 1.)

Pedimota, or *Imperfect or Partial Founder*, where there is a disturbed attachment only, attended with certain deformities of the hoof, and a partial sinking of the bone. Sometimes in recent attacks of this affection, *bladders*, *galls*, or

Many appear to be the varieties or gradations of this affection in feet, and the disease may be formed by a gradual chronic process, or suddenly, and at once, as in a few hours.—Cases within our practice have occurred where it has happened after violent exercise, and the body has become considerably heated, that the foot, suddenly chilled by the imprudent application of cold water, has been attacked by a most destructive kind of inflammation in the vascular tissue and apparatus uniting the bone to the hoof; and these parts being surrounded and confined by the solid hoof, through which, as the fluids thrown out could not penetrate, necessarily take a course to the top of the hoof, and with dreadful pain and suffering burst their way out at various parts of the coronet, lacerating and destroying the texture of these parts. Now it is not in these cases the usual process of purulent suppuration; but a red, watery ichor, escapes from the ruptured vessels, and rends the texture of these parts in such a way as to give them very much the appearance of a torn sponge drenched in blood: and with the sole also it sometimes happens, after such sudden chills, that a destructive inflammation follows in these parts, and the vessels rupturing, pour out their lymph or blood between the vascular and horny sole, which, softening the

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or *bullæ*, filled with bloody serum, have burst out upon the coronet, and by which a timely relief has been afforded, that prevented the total disunion and fall of the bone. And these *bullæ*, or bladders, on their subsidence, after a time disfigure the skin and subjacent membranes with adhesions, knots, and warts. The next affection to this in degree I have called the

Pediturba, or *wrinkled Foot*, by which I understand certain febrile actions and affections, that go no further than to disturb the regularity of the growth, and disturb and wrinkle the hoof, but do not constitute a founder. And next, and last, the

Coarctipes, or *compressed Foot*, which is a simple state of condensation of the whole interior of the foot from shoeing, not however implying founder, though with facility leading to it. To this disease, though as yet undescribed in intelligible characters, a very large proportion of the horses may safely assert an indubitable claim.

horn, it is with dreadful suffering presently forced from its place, and descending, is reduced to a convex form; and if the attack has been vigorous, it may bring the foot into this state in a few hours; or it may be that a mitigated attack may happen, not dislodging the bone from its place, or forcing the horny sole, but producing various partial derangements of structure in these connecting parts of the hoof only; and we have seen callous enlargements of the bones and thickenings of the cellular texture, about the coronet and these parts, arise from this cause, and in a less degree from mere long continued fever or heat, &c., induced in the foot, and the *waved*, the *crooked, ribbed, wrinkled, incurvated,* and otherwise deformed hoofs, appear many times to have their origin in affections of this sort. All we wish to observe in respect to the operation of the shoe is, that if it weakens in any manner the attachment of the hoof to the bone, it prepares the way for such disorders as these; and they will then arise on the application of slighter causes than could produce them in the healthy, sound hoof. Long, dry, hot summers, therefore, will cause horses to founder, or excessive exercise, or violent or protracted labour, and especially ill-fitted shoes and close nailing, we have seen often in England, and oftener in France, the finest blood-horses foundered in a few weeks from this cause.

In these cases of dislodgement of the bone, the Keraphylla, or horn processes, and the Podophylla, or cartilaginous processes more particularly extend, in following the bone, and appear to fill the space that would otherwise be vacant between the hoof and the bone with a singular material, or mass of *corneo-cartilage*, hard and tough, and occupying sometimes an inch, or inch and a half or more in width. The bone becomes rounded by absorption, its sharp edges being removed, finally occupying a round cavity, or nest in the horny sole.

In foundered feet the inflexions, or posteriors of the foot, in the fully-foundered horse, stand wide, by which at a distance the sunken foot may be known, which is caused by the coffin-bone forcing its way backwards and downwards, and stretching these parts by resting for-

cibly against them—such horses generally try to go as much as they can upon the posterior parts of the foot, bringing them first to the ground, by which the bone, resting against soft matter, is relieved from the suffering which the resistance of the more solid anterior parts of the hoof would have occasioned it. For the treatment of this complaint, as being foreign to our present purpose, we shall refer the reader to p. 9 of the *Stereoplea*.

Founder also appears to arise from very long standing in the stable without exercise, with the mal-influence of the iron assisting in the mischief; for where there is exercise, a slight movement in the bones of the hoof will take place in spite of all the restraints of the shoe; but here there is none at all, no sort of elastic action. And the parts inflame, and derangement is the consequence.

There also appears to be another disease which the Americans call founder. A horse in prolonged travelling becomes heated and feverish and uneasy, and if Indian corn or maize, especially if it be new, be given to him, he is seized with a peculiar affection of the bowels, and they say he becomes foundered. Not having ever seen this complaint, I am not assured of its exact nature, and whether the feet are connected with it or not, or only so casually, and if the attack has been very violent when he casts his hoof.

The ancients describe a disease similar to it, which they call *Crithiasis*, from κριθη, *hordeum, barley*, and the account of the Greeks agrees very much with the description given by the Americans. We could desire further information on this matter from those who may have favourable opportunities of observing it. It may be mistakenly called founder, without their knowing the proper meaning of that word. Immobility of the limbs, from a load of undigested matter on the stomach, is perhaps what they mean by this term. If so, the diluting or mixing the maize with bran or chaff, and not to give too large a dose at once, we should recommend; or a portion of water along with it, to dilute the heavy gluten of the corn, may prevent it.

All horses which race, especially old ones, must ever be in the greatest danger of founder, being kept all their days in broad iron shoes, and then suddenly, on the day of racing, put into narrow ones, called plate shoes. These kind of shoes are so thin and weak, that they spring to their impression, and being used with all their whole force in the race, the sudden expansion of the foot must inevitably create excessive pain, and tend to dislodge the bone, and finally occasion founder; and hence we see that not only *Eclipse* and *Worthy* were foundered, but a numerous host beside, whose deeds, though great, have not led to their history being recorded, *quòd "vate sacro carent,"*—perhaps some experienced amateur of the turf could afford me the means of abundantly filling up the deficiency. Horses, in the commencement of the preceding complaints, put out and shift their feet as they stand in the stable. Horses also with the shoes kept on too long, and never removed, will acquire this disorder of founder. A contraction also about the mouth of the hoof will give a bulged appearance of its middle parts, an effect we sometimes see; for on differently-formed feet different effects are produced. In some the hoof takes to elongating at the toe, and then they say, very properly, the foot "*runs to toe.*" A natural consequence of the contraction of the sides of the wall will be the protrusion forwards of the toe, lengthening thereby the foot in this direction.

Reverting to the impression, we see, *Pl.* 11, *fig.* 5, the figure of the foot at this period. The frog, or furch, we observe, has become reduced to but little better than the half of its original bulk; being a reverted arch and soft, it has yielded and given way to the impression of the bars without making any great resistance, as they in their turn have given way, with the wall, to the more powerful iron—by absurd cutting of its exterior coat, its figure has become wholly changed from an almost equilateral triangle to a figure not unlike a man's thumb, and its texture, from soft, yielding

and elastic, has become perfectly stiff and hard, and, together with the frog-stay, hacked by knives and debilitated, from its weakness, has become exposed to frush, which in the following year will be seen to invade it by a rupture and breaking up of it, which any casual blow is now sufficient for its appearance, but which could not have happened had it been let alone.

It cannot, as the mare is still living, be ascertained in this particular case; but it has been found in several feet that we have examined at about this stage of the contraction, that the cartilages had begun to ossify, and first at their base or insertion into the bone; and it would appear also that this has taken place from the confinement and want of motion in the hoof, which is necessary to maintain the health and tone of these parts. And we have observed also, that in those cases the posterior parts of the cartilages are more affected than the anterior, their motion being of more consequence to them. In cart-horses the ossification of the cartilages through their whole extent is remarkably frequent, naturally; and this occurrence was to us formerly a great difficulty to account for. The above circumstance explains it, and seems to show that the want of freedom in the motion of the hoof, whether impeded by natural causes or artificial, will produce this effect; and the cart-horse's hoof, from being of a much thicker substance, and with less elasticity, consequently is the cause of the generation of these morbid ossifications in them.

And not merely are the cartilages affected, but, what was never known or suspected before, we can clearly show that the very bone is affected, and suffers a diminution, with all the soft parts under the impression of the iron, in a manner that is truly remarkable, losing its beautifully-organized exterior, which becomes obliterated, as may be seen by referring to *Plate* 7, where both states are exposed.

From this collapse or condensation of the hoof, and the morbid actions accompanying it, we get an increased heat of the part, and a more rapid departure of the moisture and perspiration of the hoof,

which again contributes, by the dryness, to create hardness, and to further aggravate the evils that are supervening.

Flat-footed horses appear not so sensibly to feel these effects of the shoe; and in some cases the defects of their nature even appear assisted and relieved by its operation; so these longer sustain its impression, and with less injury than the upright feet. The sole, however, of such feet, from its flatness, is apt to feel the iron, and the pressure of the shoe, by bruising this part, will more frequently give rise to corns in them. The wall is also often ribbed and wrinkled in these feet through weakness, which occasions them sometimes to be called *shelly feet* by the smiths. The furch also is often spreading, and large in such feet naturally, but soon diminishes with the cutting and the iron, and becomes circumscribed by the wall.

The foot now greatly changed, is in a condition for the attack of a variety of disorders; its diminished bulk and increased hardness cannot but be accompanied with pain and its consequences.

We now advert to the 6th cast or impression, made from the same foot of this mare in June, 1809, *Pl.* 11, *fig.* 6. Formerly it was stated that contraction of the foot was not sufficient alone to produce the frush, since we see the most contracted feet free from that disease; yet contraction prepares the way for frush, and afterwards certain casualties are sufficient to excite it. A diminished, hard, and brittle state of the furch, from contraction and thinness in the horn covering it, from its being too closely pared, will render it liable to be broken by collision or impulse against the stones; great heat alone in the feet, proceeding from a feverish state of the body, in consequence of too strong or too much food, and the want of due exercise, or the feverish effects of shoeing, will also induce a frush at this weakened part; or, after the frog-stay has been weakened, exposure

to wet, by occasioning the remaining weakened horn to rot, will induce it. From one of these causes, and we apprehend chiefly the latter, a frush has actually taken place in the mare's foot now under consideration.

The miserable appearance the foot now makes, strongly marks the wasting and impoverishment which a frush, and the loss of the frog-stay, bring upon it:—the meagre sharpness of the heels is very striking, and one side of the frog has suffered considerably more than the other, either by casual encounter with a stone, or from being more cut and denuded by the knife; the inflexion, bent over this side, is encroaching, and nearly surrounds and incloses the wasted base of this smaller side of the frog; and this part would now but ill bear the pressure even of the thumb, much less the weight of the body of the horse in passing over any irregular surface.

The compressed sides of the hoof, and the lengthened appearance of the toe and heels, have now brought the foot to a sort of parabolic figure, from being round and bulging laterally: and the frog, from an elastic, broad, and nearly triangular form, is fast assuming the figure of a man's finger; its centre, wasted by the frush, and its sides collapsed from the pressure of the bars, it is incapable of making any resistance whatever to the encroachments made upon it; so the foot, if now exposed without the shoe, would become as painful, or more so, than if kept in the fixed state to which it is accustomed. This is seen if the shoe be taken off, or lost on the road, and the horse is obliged to travel even a small distance without it, for he then goes lame; and hence the great utility and necessity of the shoe to the foot would be established in the opinion of the public, and would occasion its imperfections to be overlooked: indeed, in this state of the foot, the shoe becomes of the greatest necessity; for, it must be admitted, that the horse cannot now do even tolerably well without it.

If the foot has been previously well formed, or in such way, and

with such properties as it is found with, in the middle order or medium stature of horses, or especially as in the blood horses, it is impossible that inconvenience should not be felt in some way or other in his manner of going, at this degree of the contraction. Some leave the stable tolerably well, and do not at first appear incommoded; but, ere they have travelled far, a want of firmness and proper stepping is almost sure to be perceived by the rider: some, on the contrary, go very crippling and badly at setting off, and mend as they get warm. Their manner of expressing what they suffer will be very various, according to the temper of the animal, the nature of the foot, the more gradual or sudden progress of the contraction, and also the manner in which the shoes actually on the feet are fitted and nailed.

We have not terms to express with any precision the affections, and their gradations, of the modes of going in these different states of the horse's feet; and it is usual to take as little notice of these defects as possible, for very obvious reasons—the fear of lessening in any way the value of the animal, and the dread of being reproached with timidity or want of jockeyship, &c. It is therefore commonly glossed over as of little consequence, or considered a natural sort of defect, and rather to be treated as a subject of jest and ridicule than as an object deserving commiseration: it is usual to consider it as somehow a defect of nature, or that it has some relation or correspondence to the decrepitude of age.

With men employed to drive stage-coaches, these defects are but ill understood, and often made subjects of much humour and merriment, and they continually are inventing pleasant phrases to disguise their being too seriously considered, and remove from public attention the too obvious sufferings of these animals, and prevent what they deem impertinent inquiries respecting them, or any notice or commiseration. The more jocular these phrases are, and the less meaning they convey, the more they are suited to their purpose; for though such men have but blind and obscure views, if any at all, of the

manner in which these imperfections are produced, yet they cannot but perceive them, and there is a pride in not admitting their existence. Thus if any inquiry be made, we are told the horse is "*only a little groggy,*" insinuating thereby that he is tipsy, or goes as a man does that has taken too much liquor, though it is but too obvious that the poor animal could have borrowed his grog only from the glowing countenance of his ruddy friend on the coach-box. At other times, if one presume to inquire respecting it, we learn that "*he is chest-foundered:*"—how this part can ever founder remains to be disclosed: but it is a notorious fact, that the pains of the feet of many horses will occasion a strong retraction of the chest, and hollowness of the skin and muscles at the front of the breast, from its operating probably as a man with a belly-ache holds in his stomach, till the parts habitually take this form, or the effort or exertion of always standing or going on the toes may assist in causing this restriction. "*A stitch let down,*" or "*a screw loose,*" are other rather figurative modes of describing this condition; "*as lame as a tree*" is also a favourite expression, not confined to jockeys, and trees that never move are brought in to illustrate the subject of the going of horses. "*Queer understandings,*" "*shook in the shoulders,*" "*a cat on hot irons,*" "*a nodding cove,*" or "*a hop merchant,*" are choice and lucid terms, ever ready for the satisfaction of impertinent inquirers into the affairs of horses, and serve to guard this mysterious department of knowledge from the danger of exposure. And such answers are but too often received as proofs of deep skill in horse-flesh; for as they convey nothing that any one can comprehend, so they serve to throw an impenetrable veil over these defects, and excite a dread of interference with the intricate affairs of horses.

We have already stated, that phrases are wanting to represent the various exhibitions of suffering; but we may observe as to the fact, that the first effects of tenderness or of pain in the feet that is not very acute, will be, that the animal will not permit the limb to take

the full extent of its motion, and, restraining the action of the shoulder, will occasion a contracted step. This being the first external indication of the pain, it is often, by superficial observers, referred to the shoulder itself. The foot in general, for the same reason, will not be raised so high above the ground, in order that the impulse on its descent may be less, thus inducing tripping. And the going on the toe, as it is the most fixed part of the hoof, and is left unrestrained by the nails, so it remains the soundest, and the least injured by the operation of the shoe; the horse accordingly, when travelling, endeavours to make it serve all the purposes of the foot; and hence the digging, hobbling, and often blundering manner of going. There is frequently also, in the more early stages of the mischief, as at about five or six years old, a degree of faintness, and most distressing sense to the rider of a sinking under the weight, and hardly endeavouring to uphold himself: this is the dangerous period where no art of the rider can scarcely keep him from falling, and is distressing almost beyond endurance. This is the moment of conflict between nature and the iron, which, after a time, differing according to circumstances, terminates in the recedence of all the parts of the foot before its iron protector. In travelling we have often witnessed this feeling, and knowing its source, with an indescribable anguish, without daring to do the willing animal the injustice of punishing it as an offence of his own. Such appear to be the affections and their causes, and by considering them, we hope that in time a more just view of them will lead to a mitigation of their multiform and most cruel wrongs and sufferings.

Our roads every where exhibit what may be naturally looked for as the consequences of these imperfections in the mode of going of our horses. People on horseback are seen quarrelling with their horses, and violently abusing them for their negligence and want of care, as they apprehend it to be, in their going, jagging their mouths with the bits, or using the whip or the spur, "*to keep them alive,*" and prevent their falling; sometimes cutting them on one shoulder,

and sometimes on the other,—for it is a matter that has not yet been decided, whether in these cases it is better to punish the offending limb, or that which is opposite. The nodding of horses, alluded to in one of the above phrases, is a habit frequently seen, and, we have thought, more especially with the hackney-coach horses; it perhaps affords a momentary relief to the fore feet, from partially taking off the weight of the head at the time of making this movement.

And as horses, when brought into this crippled condition, are no longer of much value, so they usually fall soon after into the hands of unprincipled men, who make them serviceable by severity of treatment, with harness more particularly, and the use of the bearing rein, inflicted in a shameful manner; and with such insolence are their measures carried on, that reasonable men scarcely dare to interfere, as the laws do not protect them;* and being cheap, there is no

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* Lord Erskine has, however, greatly to his own, and the honour of his profession, (for one should have expected it more reasonably from either of the other learned professions,) stepped forward in their behalf, and endeavoured to obtain for them the protection of the law. We hope his generous intrepidity, and hatred of oppression of every kind, will not let him desist from renewing the attempt; though we could wish a more generally diffused information, inducing a spirit of humanity towards them, should rather take place to effect their relief, than the terrors of offending against the law. Claims so natural and strong for protection surely cannot long be resisted. Heathen Rome had more humanity; for in the early periods of the Commonwealth, it was death to any one maliciously to ill-treat the oxen, so meritorious were they deemed, and deserving kind treatment for their services and uses, and as having the particular protection of the gods. The horses of their public games which acquitted themselves well, were kept at the public expense till they died of old age.

The sacred writings were not meant to convey a code of laws respecting the usage of animals; but from a single precept we may judge of what complexion it would have been if made, when it is said, "Thou shalt not muzzle the ox that treadeth out the corn," intimating figuratively, that not only they should not receive abuse and cruelty, but that the most liberal and generous treatment should be extended to them.

Richard Martin, Esq., Member for Galway, has, since my writing the above in the former edition, perhaps encouraged by the then ministry, brought in, and carried this bill through the house, and very meritoriously enforced it afterwards in Smithfield and

restraint to cruelty on account of their loss, that they are made to endure the most intolerable hardships and abuse, as though their inability were of their own making, and they merited to be ill-treated for it; excess of labour and suffering soon renders them totally useless, even for this service, and they are then obliged to be slaughtered; for, continual severe pain, which in various ways is their portion, will, as in all other animals, wear out and exhaust the bodily powers, and prematurely bring on disease, and the necessity of their being destroyed; and in this wretched state, often are they seen severely punished and abused, for errors they cannot help, and "when they have done their utmost exertion, because they cannot do more;" and the laws which maintain the most trifling rights of men, in respect to personal safety, had no protection till lately to these innocent and often beneficial slaves from ill usage, however gross and unmerited. Indeed, the shoeing, as it is called, does in fact create a necessity for cruel measures, as it goes on, to keep pace with, and oppose its effects. And much of their ill usage also comes from the ill temper and savage disposition of the half-drunken people usually employed about them, who have little patience with them, and the failings their miserable condition brings upon them. It seems, indeed, a monstrosity of injustice, that after the use of his feet has been taken from him, he should be abused and chastised because he can't go; and especially when we recollect his willingness on all occasions to exert his strength and powers for us, by the slightest intimation of our wishes, even to the extinction of life itself; and contributing, as he most willingly does, to the benefits of every class of society,—the pomp of the great, the pleasures and interests of the middle ranks, and the wants of the poor,—and assuredly not deserving such a return.

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about town, setting an example that has been followed with the most beneficial effects in other parts of the kingdom: we hope the example will also soon be extended to other nations.

Horses by thousands are annually thus destroyed with circumstances of shameful barbarity, by errors induced upon error, and which custom has rendered but too familiar for us to see in its true enormity; and whole centuries* have blindly passed away, in which these errors have not been perceived, in an ignorant and thoughtless acquiescence with them; and formerly with more effrontery and harsh proceeding in those inflicting them than at present. From these causes horses are made scarcer and dearer consequently than they otherwise would be; and a greater number are obliged to be raised for the public supply, and tracts of land must be kept untilled for their support. Men scarcely begin to get used to their horses often, and their horses to them, than they are obliged to abandon them. Post-masters and jobbers of horses are struck with astonishment at their prodigious and unaccountable losses, which can, for a great part, be traced to these causes. It is often the case, however, that from a timid or avaricious spirit, inn-keepers and stage-masters are under-horsed, or without a sufficient number for their work, in order to save the expenses of purchase and of keep, which brings on those they have more labour than is consistent with health: pains of the feet, gross offences to the mouth, unwarrantable and distressing loads, harass and exhaust their natural powers, and farcy supervenes, and is with difficulty again removed. They suffer losses in consequence, which further intimidates them; and they progressively get into worse disorder, and sink at last into the most destructive violence and abuse of them; and then we hear complaints made of great losses, ill luck, &c. I may be wrong in venturing such opinion; yet I cannot but consider that every animal has his natural rights, and that if we avail ourselves of his faculties, we have no right to abuse and maltreat him

* How much later than the fourth century we know not; but we shall presently exhibit undeniable proof that it was not till after this æra that shoeing with nails was had recourse to, although it is generally imagined by the public that shoeing, and the use of the horse, were necessarily nearly or quite coeval.

in return. Loads ought by law to have some restraint, or we may still with impunity see inflicted more severe sufferings than by the whip; and the cruel and unmerciful is often most ignorant also of his own best interests in this respect. Both this and the bearing rein, by its intolerant application and abuse, may become a more severe scourge and persecution than the lash; mechanical powers, and levers of great length, instead of bits to guide, are now become the rage, and a most shameful annoyance of these poor sufferers.

The implements of the forge, as the hammers and the rasps, are often severely used upon them, and even injuriously, because, forsooth, they will not stand quite still to have inflicted on them what they cannot but perceive does them so much injury.—And I have thought also that in the colder climates, as in England, the temper of the horse is more mild and gentle, and he bears it better than in warmer regions; for even in Paris, which is much warmer, their manners are sensibly changed, and more violence in shoeing them is used by the smiths; and in India, I am informed, the difference of their manners, and their increased fieryness of temper, is very marked and striking.

The enlightened veterinarian should ever as his right, undertake, from his superior acquaintance with the physical properties of the animal, to be his friend and protector from merciless usage; and though it will hardly be allowed in the present day, at some future period, not very distant, this kindly office will readily devolve upon him by general consent.

We are now about to consider the last cast of this foot, that we shall find it necessary to notice *Pl.* 11, *fig.* 7, since the effects and causes have been pretty fully traced, and here we may discover a further derangement and deterioration of nature's fair form, by this pinioning of the hoof, a further elongation of the foot, and running

to toe, and compression of the sides, which must necessarily be attended with correspondent changes in the bone and interiors of the foot. The furch is narrower than it has been at all, and its base, though screwed in and narrower, appears to be less diseased, at least both its sides are become alike, and equally deficient; the frog-stay is only noticeable by its cleft, or rather fissure of the frush, which is become dry, and in a better state than in the year preceding, though the foot be more contracted, disproving the idea of contracted heels being the genuine cause of frush as had been supposed. This diminution and sinking in of these parts must have been preceded by a reduction of the cartilaginous inflexures we have formerly described, and of the elastic resilient globes, or internal bulbs; and nothing now is scarcely left to these parts but horn and bone, the sharp angles of the inflexural columns being covered with a meagre covering of furcaceous horn. And the real width of these parts is now not more than two inches and a half, or hardly so much. How incompetent therefore for its offices is it become, and that he should trip, or blunder, or stumble, can it be any matter of surprise, but is it not rather to be wondered at that he can go at all after this devastation. And what must be the chagrin and astonishment of the animal himself to find that as his feet get worse, his jaws and his sides also become more painfully afflicted in the same degree. For certainly, if we debilitate or destroy the basis of the edifice, the edifice itself becomes afterwards of but little value.

And here we may introduce a further additional circumstance which takes place in some feet, and which we were not fully aware of when we published our first edition, which is, that the Shuttle bone is sometimes fixed by this general contraction of parts, and is found adhering to the flexor tendon, and at other times, (either with or without adherence,) it appears to be affected with points of ulceration of its surface. No case of this sort had occurred to me when I described formerly the effects of contraction, and I have since ascertained, that though such exist, they are comparatively cases of great

rarity. Moorcroft had, however, seen instances of it, and has well described it, and a veterinary practitioner has been very elaborate in his account of it, giving it a frequency that does not accord with facts, and disengenuously it would appear to diminish the notice of the general contraction. Nothing certainly is more easy than to predicate a disease that only the death of the animal, and subsequent dissection could verify the existence of, taking advantage of this, he makes as much or more of it, than the old farriers did in refering all lamenesses to the coffin joint, which puts all denial or dispute out of the question, as nothing could be proved, and therefore men acquiesced, and often gave them credit for a discrimination and skill that did not exist. I have examined no inconsiderable number of contracted feet, without finding a single case of it, and so have others desired by me, that I am convinced it is a truly rare disorder. If the reader wishes to see the discussions upon it both *pro* and *con*, he may find them in the *Lancet* for 1829, and in the *Farrier and Naturalist* for the same year, and in the *Edinburgh Agricultural Journal* for 1830, where nearly all is said that can be said upon it.

To us it would appear that this rare affection has place when the shoeing has been so executed, as to drive the compressed horny sole upwards against the tendon and shuttle bone, forcing its interior edges or the margins of its cleft against these parts,—perhaps in addition to this forcible operation of the shoe, another condition may also be necessary for its complete production, that is, a long retention without exercise in the stable, since at any time the smallest motion of the tendon upon the surface of the bone must prevent it. We hope for the future that the cruelties exercised by interested persons under this pretence will not be submitted to by the public. For it is certain the ignorant and interested are ever at work to find out some pretext for operating in one way or other upon these patient creatures.

And any one would be astonished, who is unused to horses, to observe the patience of the animal under many of his sufferings, and

how little he is disposed to exhibit any appearance of pain. Nails from shoeing we have several times seen taken out of their feet, where they had been driven into, or so near the quick, that they had caused suppuration, and matter and blood has followed their extraction without his driver having at all discovered, by any external indication, that anything was the matter; so that it is clear they do not flinch at a little,—and indeed what avails him to express a suffering, as it only gets him a severer application of the wrenching iron to his jaws, or of the spur or the whip to his sides, that he soon learns to know that endurance is the lesser evil,—their patience is indeed beyond all praise; and I may safely defy any pen, however able, to paint the ungrateful amount of their wrongs and their sufferings: a share of which may now, however, be guessed at. Their strength, supposing them whole and unmutilated, is still tried often with loads that would make one shudder, and much more suited to the force of the elephant than of the horse: if they do it a few times, and are not visibly hurt by it, they then think they may do it always; but not so—the effects are at last seen, and one horse doing it for years, on account of extraordinary strength, the rest *ought*, say they, also to do it—a common and fallacious reasoning. And my only wish, in thus stating these things, is to call up more able advocates to his cause.

In the present state or degree of collapse of the foot, as given at *fig.* 7, the horse becomes but ill suited for the purposes of the saddle, and her owner had sometime ere this put her in harness, and at length made a brood mare of her, and turned her out without shoes. I saw her some eight or ten years ago, and examined her feet, which had a little plumped up from being without shoes; but this does but little for them, since the growth of parts that have been once absorbed is but a miserable representation of the original material and organization, and will bear comparison with the scar to the natural skin, a mere puffy substitute.

Such are the effects of the shoeing when moderate measures are pursued; but I am confidently of opinion, that I have seen this iron

fetter applied by the smiths in such a way, and it has induced such pain and misery, that the animal has never after recovered from its effects, or had the perfect use of the foot afterwards, and one shoeing has rendered him a cripple for life, and others have, after a time, foundered from the effects of the violence so committed.

It has also appeared to me, that the operation of the effects of the iron is not lateral only, but that the sole also is affected by it, from the clenching of the nails, and their being so forcibly driven; and that this long-continued pressure upwards occasions numbness, and sometimes lameness, and is one of the principal causes of cutting where motion is denied to the shoe itself. It must also be evident, that the rapidity of the deterioration of the foot will much depend on the more or less cutting and denudation it suffers by the smith, as well as the more confined or more liberal manner of fitting out the shoes, for which there can no rule be laid down, but which must ever be left to the simple apprehension of the workman.

Another use may be also made of this experiment and of these figures, where we are desirous of describing cases of contracted feet; the degree of it may be pointed out by a reference to them, whereas before, contraction was contraction, and much or little was all we could express of it.

Now in this stage of the condensation, as seen at *fig.* 7, the animal, in spite of all his gayety and courage, must begin to make some external indication of suffering; and whether in this case it happened or not, I know not; but in similar feet I have observed, in some horses, perhaps, where they were more sensitive, and could not bear the pain so well, they would exhibit it by a bowing of the knees and legs; and this is done obviously to avoid a too direct pressure upon the suffering parts, as a more perpendicular direction of the column would obviously occasion: this is often asserted to be natural, and to some horses I do not deny that it may be so; but I can say, that in several instances considered as such, I have known the expansion shoe in a very few weeks bring their legs straight enough: very high

heeled horses, or with high inflexions of the hoof, I have thought were more subject to this affection.

There is no telling the extreme point to which contraction can go; but I once recorded, about fifteen years ago, the appearances of two fore feet that fell in my way, where the extremest contraction existed that I had ever seen; and this was a blood-mare, I believe, somewhere about twenty years old: the following is a copy of the memorandum made of it at the time. "The frog was reduced to the size of the little finger; the cartilages were both, at their posterior portion, thickly ossified: this bony deposit extending inwards, had reached the shuttle bone, *(os transversum)* surrounding its extremities, which were impressed and locked in it. The ligamentary stuffing of the heels, or, to use a more intelligible phraseology, the convoluted, or rather convolved internal globes, were also ossified in their cartilaginous parts, with rough points, and variously perforated. The posterior edge of the middle part of the shuttle bone was eroded; and of the other foot, the front elevation of the coffin bone was enlarged and grown higher by three quarters of an inch, from ossific cauliflower deposit, which appeared to be the effect of a perfectly fixed state of nearly all things. This, perhaps, is only witnessed in extreme cases. But what is singular amidst all this ossification, the anterior portion of the fossa of the coffin bone, in which the cartilage is lodged, was in its natural state, and clear of bony deposit. This, I was led to apprehend, was occasioned by its being connected, half of it with a ligament which rarely ossifies, and which supplied it possibly with a slight degree of motion. The extremities of the coffin bone in both these feet appeared to be full of large cavities, and much absorbed; but whether longer than natural, there was no means of ascertaining. The Keraphylla were, for the most part, removed, and a sort of smooth horn cartilagefo und where they were attached, and so were the Keraphylla of the inflexions in the parts opposite to the coffin bone."

The ultimate effects of the iron on the feet, especially such as the shoes are particularly inimical to, are never seen, since they are no sooner, from loss of parts or disfiguration, rendered unserviceable, than they are slaughtered, that we know not to what condition the foot would at last be reduced.

That I might notice in a more particular manner the first visible effects of the shoe on the foot, I this year, 1811, ordered my own bay mare to be shod with common shoes; she was nearly five years old, and never had had a shoe on. In this experiment I was surprised to find that the upper parts of the hoof first felt its effects; the upper part of the hoof and coronet became heated by it after about three weeks application, and the coronary frog-band became more dry and brittle, cracking away, and leaving the hoof sooner than formerly, and seemed to embrace and bind the hoof more strictly. After the removal of the shoe, which was kept on about five weeks, as the horn grew down, the traces of its effect could be discerned in a depressed ring, which grew down as the hoof grew, and was visibly different to the horn preceding and following it.

Another effect, I believe unperceived of the shoe, is, to reduce and diminish the Keraphylla, and to redden them. An opportunity was afforded me of ascertaining this curious fact in a valuable horse, which belonged to my late valued friend, James Kidd, of Brentford. He was five years old at the time of his death, and had been hardly ever shod. His feet being brought to me for examination, the Keraphylla were found much thicker in substance, and in a remarkable degree broader, even to nearly double the width of many I had seen in feet that had been long shod; and what was singular, and contrary to what we had before apprehended, were not of a red or pink color, but a clear white. The action of this mare, by those who broke her in, and by others who rode her, was particularly noticed as being free, extensive, and firm, to an extraordinary degree, beyond any horse they had ever recollected to have rode before; and their expe-

rience in this way was not inconsiderable; which must have been greatly contributed to, if not chiefly occasioned, by the full unfolding and perfect developement of the organization of the foot.

In 1819, I examined with close attention the Keraphylla of the hoof of a horse that was eight years old, and that had never been shod, or with any other than the jointed shoes, and not much with these. And these parts were found broader than in the shod foot, being a full eighth of an inch wide, and when washed were perfectly white; they appeared also thicker in substance, and their loose edges more smooth, and not so torn or ragged as these are generally seen. And a remarkable difference presented in these feet in the depth of the inner heel, or column of inflection, being very considerably deeper, and the sole also lower down the inflection than in the outer side, to a degree I never witnessed in feet that had been sometime used to be shod.

Having now exhibited the inimitable beauty and simplicity of design in the structure of the foot of the horse, and its provisions for destroying a too sudden resistance to the weight of the animal on meeting the ground, and disclosed by actual experiment, proofs of the injurious nature of the shoe in respect to this property; and though much labour and care have attended these elucidations, yet we apprehend our readers will expect from us the consideration of further topics relating to these matters, and about which they may be even more solicitous than about the above illustrations, which were, however, previously necessary properly to understand the nature of these evils. The reader would perhaps be desirous of asking, What can be done with feet, already injured, as to their restoration? and whether we must be obliged to go on with these errors from the impossibility of removing them? or whether we may partially remove them with those horses whose very utmost work is not required?—for it will be readily admitted by us, that to obtain the full measure of work which the horse is capable of giving on the

road, some artificial defence is necessary; or whether, by refraining from early shoeing, except with tips, the mischief may be greatly palliated, and we must rest content with that? or if we may look for a total removal of the evil in all cases by shoes on a principle widely different? Time has hardly been sufficient for us to consider and answer all these inquiries; nor do we consider ourselves pledged, in consequence of these discoveries of the defects of the present system, to find a remedy; since it has been much to point out a gross evil, that was scarcely before suspected, and certainly not seen in its true light. We believe, however, that preventative measures may be resorted to, to a great extent, and remove a considerable share of the evil, without much inconvenience and loss of labour; and of the remedial means in part, or perhaps wholly, we can, after much reflection, hold forth promising expectations, and which we believe will not be disappointed.

The above extracts, taken from my former edition, serve to exhibit the state of things at the time of concluding that work, about the year 1812. At that period, my views and attempts were considered as quite visionary, and I often experienced the reproach of having discovered an evil for which there was no remedy. But what is still more singular, nine years elapsed, with all the above facts before the public, without the least proposition from any one for the removal of the mischief, as though the case was indeed hopeless. Having, years before the commencement of publishing that work, seen how advantageous would be the disuse of nails, and conceiving that shoes might be attached without them, and be made removeable at pleasure, I had been long occupied with this object; and afterwards, from beginning to see the full effect of the nails, I redoubled my efforts, and, sanguine in the success of it, secured my rights for a shoe of this kind by a patent; but after a long and tedious trial, abandoned it, as being too troublesome for general use, though great advantages had been fully proved by their use on several occasions. I then, fatigued and injured in my health, quitted these shoes, and resolved upon

pursuing the other principle,—for there are but two, that is, to use nails, but to give a motion to the shoe itself. And after trying this for some time, and finding that the purpose was answered, in saving the foot from contraction, and extending the step of the horse, I proceeded to publish, in 1817, the *Stereoplea*, giving an account, and recommending the lap joint shoe, and also giving some account of the former removeable shoes, using a steel-headed rivet for the lap shoe, otherwise it could have been of very little use. I also invented at this time a new kind of shoe or defence, which I called *The Paratrite*, which defended the front of the foot and wearing line only, and was held on by teeth and a helmet in front, to which a strap round the coronet, and buckle was attached: this was easily driven on by means of a hammer, or even a stone, being made of thin steel, and then fastened, became a defence that doubled and trebled the natural powers of the hoof. To pursue, however, historically, or chronologically, the narrative of these proceedings, I may observe, that now the public attention in several instances began to be attracted to it; in this year, my ingenious friend, Benjamin Rotch, Esq., a barrister, seeing the importance of the elastic principle, took out a patent for a new sort of shoe, formed of several pieces, connected together in the form of a horse-shoe by a thick piece of sole leather, rivetting them upon it, and actually sold licenses for using it to some shoeing smiths about town: it, however, though ingenious, proved abortive, as each piece could only receive one, or at most, two nails, which were insufficient, in case one of the pieces should bear the whole weight of the horse, as in the circumstance of his encountering a stone would happen, when the clenches would either give way or break, and then the next piece would also loosen, and thus in succession, the whole would come off; so that it was soon after abandoned.

A little after this period, I found out what appeared to me a much better way of making a joint shoe than the above lap; and that was, by a shoe of two halves united by two rivets, holding a steel piece

between them, imbedded in the pince of the shoe. The trial of this realized every expectation and wish, as being a more durable shoe than any other, and with plenty of motion, which also could be easily limited. I hesitated some time whether to take out a patent for this novelty; but at last determined to give to the horses and the public all the benefit of it, without any clog of this sort, and published an account of it in 1820, and constructed a forge at considerable expense in the Edgeware Road, near Paddington, for the perfecting it, and applying it, calling it *The Steel Tablet Shoe of Expansion*. In the next year, 1821, Colonel Goldfinch took out a patent for a shoe, having no other property than a simple division of the common shoe into two pieces,—of course the two halves, not supporting one another, they would come away, and carry a large mass of the hoof with them,—so that this also was soon after abandoned.*

About this period, whether later or a little earlier I don't exactly know, my worthy friend, Joseph Dockwra, of Kelvedon in Essex,

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* To those who prefer the lap joint, the great evil of it is, the friction of the two surfaces, especially if these are at all extensive, and are rivetted a little stiff. To prevent this, I propose that these surfaces should not be quite flat, but a little matter raised or elevated in the middle, by which the possibility of much friction would be prevented; for the power of the hoof in overcoming lateral resistance is not great, and will be easily obstructed. There is the same difficulty with the tablet shoe, but not in quite so great a degree, and the same measures should be used to avoid it. Both these shoes, made of Lucas's malleable cast iron, are found to wear extremely well, and are formed with the nicest accuracy. In this case, instead of casting the holes, we cast a deep fullering, and perforate them afterwards with the common pritchel with perfect ease. The less these shoes are put in the fire and knocked about the better. We have also thought that, to render these surfaces of the joint less obstructive by their friction, a concentric raised thin circle round the rivetting hole, and another raised line near the external edge, would prevent those surfaces coming in contact, or having any friction. Suet might be lodged also in the vacant depressed space between the two circles, that would facilitate their motion, and prevent rust also, or the anti-attrition compound might be used for this purpose, of suet and black lead.

having purchased and read my work, and disliking the going of his horse, and not being able conveniently to get any expansion shoes, directed his smith, as a resource of necessity, to omit the nails, or leave them out on one side of the shoe, or at least with but a single one near the pince on the opposite side of the foot. This mode of proceeding could not of course but occasion solicitude for the safety of the shoes as to their coming off: finding, however, on trial that the horse went better, and that they did not seem so dangerous as he expected, he persisted in using them, and recommended this mode to his friends at Coggeshall in particular, and it became with many of them a great favourite, and afterwards extended into all the surrounding parts of Essex.

Visiting France in the year 1828, and not being able to obtain a regular supply of the expansion shoes from England for my own grey mare, which was purchased of the Duke D'Escars, who himself took a warm interest in these discoveries, I resorted to these shoes; and from a state of the most miserable decrepitude from contraction, brought her round to go in the most beautiful style by their use. She was vicious in the highest degree in letting the grooms or smiths handle her feet; but after some time would allow me to do any thing with them I wished, without the least resistance, no doubt from experiencing the great relief which they afforded her. At this period I first added two broadish front clips to this shoe, embracing the two sides of the front of the hoof, about three inches asunder, having previously, two years before, done the same with great advantages to the expansion shoe. These additions prevented the shoe from being forced backwards on the pince striking the ground, which is the way shoes most often are forced from their place and become loose, and so applied, they proved of essential benefit, rendering the few nails employed quite equal to the task of holding on the shoe; and in every kind of shoeing they may be resorted to, to render nails less necessary, especially those in the back

parts of the inside quarter, the main point of offence, and which may in a general way be omitted when these clips are employed.

They also act beneficially in steadying the shoe, and, in another respect, that they prevent the front nails, if we nail round the toe, which we most often do in these sort of shoes, from being driven backwards against the quick, and compressing it. In order to the forming these clips conveniently and easily, I use a tool on purpose, to raise the metal from the surface of the shoe, consisting of a shaft of some length with four sharp corners to it, on one of which I raise the clip. This shaft is inserted for this purpose into the hole of the anvil: (see its figure in the description of the Expansion shoe, *Pl.5, fig.* 3.) These clips should be made to stand fairly out on the margin of the shoe, in order that little or no horn be removed from the hoof for their insertion, as the loss of this defence must make the pressure more liable to be painfully felt.

In this state it was recommended to the attention of my friend M. Crepin, a celebrated veterinary surgeon in the Rue de Bourgogne, in Paris, who shod his own mare with it, which had lately fallen with him, and found in it a perfect remedy for this defect, and an invaluable means of restoring lame and contracted feet, and that had refused to yield to all other treatment. M. Delaguette, of the king's body guard, a very distinguished veterinarian, also used them with the horses of the officers of his regiment, and with the happiest effects. These gentlemen have both of them since nobly come forward, publicly to attest the result of these experiments, in the *Journal Pratique* of the year 1829; and several very valuable horses in Paris were restored by this means to a state of remarkably-fine action that before were but cripples, and almost useless. And I have understood, that since then it has been taken up with success by other professional gentlemen of that metropolis; and thus was introduced the advantages of expansion shoeing into that country. And we may here observe, that although this mode or plan of shoeing

consists merely in the omission of the nails of the common shoe, yet, carried to the extent to which we here describe it, it may be fairly designated a third principle of shoeing; for we have before stated there are properly but two, viz., a shoe that was moveable in itself, but firmly fixed by the nails, and the other, a shoe entirely without nails, and removeable at pleasure. Here the motion or liberty is obtained in a third way, viz., by a shoe firmly fixed by nails, but omitting nearly the half of them on one side, the foot therefore is left to enjoy almost its natural liberty on the other, and, for distinction, we may call this the *Unilateral Principle.*

My friend, Isaac Brightwen, who shoes extensively in this manner, often bevils the heels of his shoes outwards on their upper surface, which greatly facilitates the expansion of the free quarter, and the horses are found to go remarkably well with it. Caution, we believe, however, should be used with this proceeding, in not making the slope too considerable or sudden, in order that the higher metal should not come in contact with the inflexion or bar, which would inevitably occasion pain and uneasiness, as we have formerly experienced. The inclination outwards should also not be too sudden, as it might force a degree of distention that would become painful; therefore the slightest possible degree of slope is what we should recommend, or an entire flat, if this slope is found oppressive; for it is obvious that a shoe, with the heels inclining inwards in the usual way, would be liable to prevent the expansion altogether, and compress the foot, leading it inwards down the declivity. In this state, we may remark, that this shoe has a distant resemblance to the shoe of old Labroue, two-hundred years ago, but with a much more excellent effect, as his notions about it were confined to the heels only of the foot, and went no farther; and the foot being nailed extensively on both sides in his shoe, but little benefit was derived from the bevilling, and not where it was most wanted, viz., on the sides of the coffin bone. Where the shoe itself opens and moves, no such bevilling is at all necessary, as the hoof and shoe move and open together; but to such a shoe a

bevilling may be given to the underside of the heels, in order to assist in forcing the shoe open on its pressing upon the ground.

The above appear to be nearly all the propositions for shoeing these discoveries have given rise to, that are worth recording; others have indeed been made, but of too futile a description to deserve notice. Two forges now, however, I have the satisfaction of saying, and from the bigotry and senseless prejudice that at present prevails, I am sorry to say, two only, professing to shoe on the principle of Expansion, are found in this great city—one is held by my nephew, CHARLES CLARK, in *Stamford Street, Blackfriars*, whose ingenuity and discussions on these subjects are well known to the public—and the other by my friend, ISAAC BRIGHTWEN, of *South Place, Moorfields.*

I may here just observe, in terminating my labours, that the business of shoeing the horse, hitherto the most difficult, obscure, and almost incomprehensible department of horse knowledge, may now be fully understood by any one inclined to study it, and can only in future remain obscure to the wilfully blind. Those points or matters which the present treatise cannot with propriety embrace, will be found treated of, and discussed in a new edition, lately published, of a *Description of the New Tablet Shoe of Expansion*, giving all the requisite information upon it, and the reasons of its figure and proportions of its parts, &c., with the best manner of forming it, whether by hand, or of cast metal;—testimonies also accompany it of many who have long been in the habit of using them.—

Other branches of this study, such as rearing the young horse and his hoofs to the most perfect state—the different kinds of hoofs and forms which they assume—on foundered feet and their treatment—the actual manipulations of the Forge, with other miscellaneous matters, not properly admissible in either of the former treatises, will be found in the *Stereoplea*, a new edition of which is in contemplation, it having been nearly ten years out of print. Numerous cuts, beautifully executed, accompany the above works, which are sold by

UNDERWOOD, *Fleet St.*, and LIMEBEER, *Giltspur St., Newgate St.*, the former at 12*s.*, and the latter at 7*s.* 6*d.*, and when combined with this present work, form together, in one thin quarto volume, an entirely new and original system of the foot of the horse, and its defence.

Simplicity and clearness have been the chief aim of the writer in forming this work on a subject naturally deficient of expression, and difficult: if any are offended at the strictures it contains, his only defence will be to remind them that the first edition, which might have been rendered severe, contained none of these, and it was not thought necessary to use reproof till twenty years had passed over, and it was obvious no advances or progress had been made towards the light, or towards those truths they could not overturn, and the establishment had become a real clog and obstruction in the fair way of the profession. Then it was that reproach became necessary, and we could easily show that reproaches more severe might have been used without at all o'erstepping the bounds which truth prescribed. And these relate only to those professors now existing at the head of these establishments, and which, from natural causes, cannot be of long duration, when great changes, and it is to be hoped, beneficial ones, may be expected. It is our earnest wish, as we ardently love the pursuits of this profession, and at great cost have laboured in it to promote its views, to take by the hand, and give assistance to all concerned in it that are simple-hearted and honestly inclined; and on many occasions we have given proofs of our zeal in this respect, though badly affording it, and receiving nothing in return but the satisfaction accruing from the act. Public abuses are not often redressed till they have once, or more than once, gone through the operations of the printer's art, and suffered exposure. I believe the pertinaceous blunders, and mercenary patents of the professor, would have rendered the situation precarious to any less confident character; and had it not been for intrigues in army appointments, his seat would have been still less certain. About twenty regiments in the public service require veterinary surgeons, and the appointment, or confirmation of such appointments, have been very much left to him.

This afforded the opportunity of holding out hopes, delusive for the most part, to many scores of pupils, for the few vacancies that might occur, and those would of course be preferred that were the most supple, or likely to carry on the college system.

Schools are certainly for instruction, and not for intrigues or favoritism for private ends: all should be allowed a fair start that either by industry, talents, or qualifications, are rendered fit for these situations; as well might the masters of Eton or Westminster officer our armies, or appoint our ministers,—all dabblings, therefore, of this sort cannot but have an injurious tendency on the general profession. This prerogative, however, we believe to have been gratuitously assumed by him, for appointments have lately been made without his concurrence.

Some few of his partizans, and not wholly disinterested ones, defeated on the main question at issue of frog-pressure, and other matters, have endeavoured to give to the inquiry a personal turn, the too usual course of these things, and have opened a battery of low personal abuse of a most unfounded description, and in no way connected with the question. This will not induce me to follow them in the same line, and I hope none of my friends will engage in it, although even in this way they might have the advantage.

It has been hard to see, after the painful efforts and exertions that have been bestowed in making these small accessions to our knowledge, the wretched attempts that have been used to stifle and suppress them, to support the interests of one or two individuals who have done truly little for the art. The interests of the general profession are quite otherwise, since success in practice will ever depend on the correctness of their views, and he most serves them who contributes to this.

It is by labour and research that a totally new system for the horse will in time be formed, and which, it is fair to suppose, will relax his fetters, and remove the present shameful treatment of this noble and generous slave.

FINIS.

An Essay *on turning Horses out to Grass, with a view to remedy Contraction of their Feet.*

Some explanation is due to the reader for subjoining this present essay to our work on the foot and shoeing, but which we are almost compelled to do on account of *Plate* 7 in that work, of the two coffin bones, which properly belonged to this essay, and for which it was originally executed. We are also induced to subjoin it to the foregoing work, as its details afford us the important intelligence that the foot, deeply injured by the use of the shoe, is not, as has been naturally supposed, ever to be restored again to its original condition by grass, and the removal of the shoe. And in the making these experiments it was that our eyes first became opened, and which led the way to the important truths contained in the preceding work, and to the practical veterinarian and general horseman these facts are hardly of less moment than those discoveries and details.

The high value of the horse will in general make his loss severely felt, but if he is disabled, so as to be incapable of work for any length of time, it is often attended with more serious inconvenience and detriment than death itself; that one should apprehend any accession of knowledge, however small, respecting him, if it has a tendency to preserve him from being injured, cannot but be well received, and acceptable to the public. For it may now be seen how little these affairs of horses have been really understood, or were likely to be so, by those who were supposed by the public "to know them" best; and how impenetrable a bar to their being fully understood did the obscure affections of the feet present! and what an incitement to ill usage, and cloak and protection these intricacies afforded to the machinations and knavery of the ignorant!

Our practice is very often affording fresh proofs of the extensive injury done to horses from the want of knowledge of the facts we

are about to disclose, which we hope may induce greater caution with people in having recourse to this seemingly-natural and obvious remedy for the evils of contraction.

Hardly any employed in these arts could have failed to observe that very many horses' feet became contracted by shoeing; but as it did not occur to all alike, it made them rather refer the evil to some defect of the feet than as being the effect of the shoe, though it might have been seen that the finest and most perfect models of feet were the greatest sufferers by it. And that when this contraction was very strongly marked, and especially if attended with lameness, the practice was, and continues so to be, to resort to measures for expanding the heels again, believing these parts to be the chief sufferers, and that the pain resided there principally. Cutting the horn of the heels away; turning to grass without shoes; setting them to stand in wet clay, &c., or screwing them open, are the methods usually resorted to for this purpose; and many, after the heels had been thus treated, asserted confidently the great advantages that had followed their labours: and in some instances this might be true, but in a general way, we believe, a more close attention to facts would have led them to think differently: for some are so blinded by preconceived reasoning and notions, that facts and results, if they turn out the very opposite to what they expect, do not in the least appear to open their eyes—for, say they, if horses' feet suffer from contracted heels, and these are opened, *it must be* attended with advantage: the reasoning appears strong; it is, however, as we shall see, delusive in too many cases.*

We cannot convey what we have to remark on this subject in any way more usefully than by a faithful narrative of some of the expe-

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* Mr. Moorcroft, in his little treatise, has also noticed the fact: he says, that although these horses, after being blistered on the coronets, and fomented daily, &c., and turned out, come up from grass with their feet considerably expanded, they do not appear thereby to have their lameness removed.

riments we made, and their actual results, as they occurred to us, and which, though they embarrassed us very much at first, ultimately served to open our eyes to the truth; but so strong did the reasons seem for these measures of restoring feet by removing the cause, and giving opportunity of expansion, that it was not till after much research and repeated failure that the reason of the want of success appeared: now it appears only matter of surprise that so obvious a reason for this could have been so long concealed. It serves to show how necessary it is for those who would make new discoveries, to hold their minds open to receive impressions which may not comport with their present reasoning, nor lean too much upon it, as it may close the eyes to very obvious and simple truths; it is from this prejudice of reasoning that discoveries when made are often lost again, because the reasoning on which we repose cannot reconcile them, and they go rejected till more enlightened times and views give them a reception; on the other hand, errors supported by apparently-good reasoning shall be continued to be practised for ages, and their ill consequences be overlooked, though constantly accompanying them, being stifled in the apparent reasons which supported them, till at length more accurate research shall point out their evil tendency, and then will appear also the fallacy of the reasons which upheld them; or, which is more common, that the error arises from too general and sweeping conclusions, drawn from apparently simple grounds or premises; but where some lurking condition that is overlooked is necessary in the account, and is sufficient to falsify all the conclusions and reasonings, however clear and strong they may appear.

It would be perfectly natural and easy to conclude, that when the shoe was removed from the foot of the horse, and his foot was left again in its natural state, that it should recover from the effects of its embrace, as naturally as we at night remove shoes from our feet that have been too tight, and find in it a ready and effectual remedy for our uneasiness: and with horses it would be as confidently imagined, that if their shoes were removed, the same good effects should

as naturally ensue: hence the difficulty of apprehending a different result. And long have these measures been acted upon, led by presumptive opinion, and believing in it though false.

The fallacy of the reasoning is now obvious enough; the horse's foot in nothing resembles the human, and the shoe is a bar of iron that has no similitude to our leather shoes; and the perpetuity of its application has no correspondence to the removal of ours every night. That similarity of names merely has served to beguile our reasoning in this respect: a relation of the experiments themselves, in which we have endeavoured as much as possible to divest ourselves of any bias, will better serve to unfold the real effects than a generalizing narrative of the results.

In the month of April, 1804, a Mr. Mangnall applied to me for assistance respecting his horse, a handsome bay hunting gelding, well bred, and about fifteen hands and a half high. A complaint was made of his being tender on one fore foot, blundering with it frequently, so as to endanger his coming down. There appeared no swelling or external appearance in the limb that would indicate a strain or preternatural heat, or other cause for it, which led me to apprehend that a pinching shoe, or a nail too close, might be the cause of the evil. I ordered the shoes to be removed, the foot pared out, and the nail-holes to be examined, and a new nailing and shoe to be used; the foot to be immersed in cold water, and to be afterwards stopped with emollient stoppings. These were applied for some days, but with little relief; complaint was still made of his manner of going, and an anxious desire expressed of parting with him, to avoid expenses, which perhaps before had been found but too often of little avail. He proposed the purchase of him to me, with all faults; and I purchased him at once for 24*l.* Apprehending, with tolerable confidence, that it had been, or was the effect only of the embrace of the nails of the shoes and of contraction that had caused this defective going, and that by a few weeks turning out to grass he would be restored, and become a valuable horse, I had the shoes

removed, and turned him to grass in a field near Peckham, having first pared the hoof thinner, that it might make the less resistance to the expansion of the heels, as we called it. On having him up from grass, about six weeks after, I could not but be struck with the singular alteration of figure that had taken place with both his fore feet, but more especially the near one, which was the tender one. The toe, to use a phrase of the smiths, had "run out," and appeared longer; the quarters or sides of the foot had become flattened and almost bent inwards; the heels had somewhat opened, and were projected more backwards, or at least appeared so, that his foot had more the appearance of a square than a round; his chest was retracted and hollow,—a frequent but not a constant attendant of pains in the feet; he stepped short and tender, and went near the ground, and on his toes as much as he could; his hoof also appeared bent in in front, or was incurvated about the middle region of its height, and assumed somewhat of a twisted figure.

Having no knowledge or suspicion at this time of the effect of the nails, I was wholly at a loss to account for these appearances: apprehending, however, that, whatever it was, a more complete expansion of the foot would probably remove it, I resolved to send him to grass again, by which I hoped soon to obtain the benefit I apprehended must ensue. After being at grass several weeks longer, I had him brought up again; and, having occasion for his services, determined to use him, and not to apply the shoes, that the expansion, from the exercise and the additional weight of the rider, might be the more effectually accomplished: and this I continued to do for several weeks, using him only at times, as his hoofs would bear it; notwithstanding, he went painfully crippling and tender; and sometimes at grass, and sometimes in use, this I continued in the practice of for several months; for though it was during this period my suspicions began to be awake to the probable influence of the nails, and the former experiment to detect it was made, yet I saw no reason

why feet should not be restored again if the cause were removed. Sometimes he would put forth his feet with considerable boldness, and go tolerably fair; but for the most part his pace was miserably crippling and tender, and saving his feet. This difference I have since believed was the mere effect of the spirits he happened to be in to endure pain, or his insensibility to it, or from the manner he was fed, or the state of the atmosphere: he tripped, however, and hobbled, both with and without shoes, that riding became highly dangerous. Finding these measures not likely to restore him, and that longer perseverance promised no advantage, and tired of the ill success and expenses of the experiment, which had now been continued more than a twelvemonth, I broke him in for harness, and resolved to sell him, but with bad success also for several months more, and at last sent him to Tattersall's, to be sold for whatever he might fetch, which was little more than one half of what I had given for him. I drew no other conclusions from this experiment at the time, than that there must have been some other evil than the contraction of the feet to account for his not being relieved. Still confident in the efficacy of the means, a few months before I sold this horse, I bought another also, a brown hunter, of a Mr. Forster, whose feet were tender before, and from corns, as he had been told; but on examining his feet, and finding there was nothing of the kind, I apprehended contraction was the sole cause here also; and the removal of the shoes, and turning out, would set his feet to rights again. I purchased him for about the same sum, and sent him to the same grass field, to be company for the former. The bars were pared away from the frog; the heels, as we are used to express it, were *well opened,* the quarters rasped thin, the hoof smeared with emollient ungents, &c., that there might be as little resistance as possible to its expansion; and nothing that we could devise, with a prospect of advantage, was omitted. Briefly, he became very nearly in all respects the same as the former; his hoof fell in at the quarters, his chest

became retracted, and his action the same as the former; and I sent them both on the same day to Tattersall's for sale, with a similar result.

The ill success of these experiments made me more cautious, but did not at all open my eyes to the cause of their failure. Hoping still to obtain a valuable and sound horse by expanding their feet, I purchased, late in the autumn of the same year, a favourite brown gelding, suffering evidently from contraction, of a Mr. Soley, an eminent surgeon in London; and resolved to try stronger expedients with him, and to give the utmost opportunity for the desired expansion of the foot.

I was very desirous of restoring him to soundness, on account of his good temper and inestimable qualities. We shall call him *Tippoo*, the name we received with him. He was bred by Mr. Shum, a brewer, and, as I learnt afterwards, had early been shod and brought into use: he was sold for tripping, for he had no vice; and I bought him Oct. 7, 1804. His fore feet were tender, going with short steps, and very much on his toes, which appeared evidently to proceed from the contraction of his feet, (his heels as I then apprehended,) and the following measures were used for restoring him. He was seven years old, consequently had been shod about four years, or four years and a half.

Many expedients occurred to me for forcing the heels open mechanically, as by screws, springs, wedges, and the like, or by the means St. Bel used to propose, by bevilling the heels of the shoe outwardly instead of inwards; yet from what I had seen of the want of success attending such measures, and from considering also that if the heels were forced open, unless there was something within that could support them in that state, it could be of no real or permanent utility, I did not pursue any of them; and from reflecting that living sensitive parts cannot bear much restraint or violent mechanical distension, or endure very sudden alterations of form, unless accompanied by a slow process of growth to maintain them; and if disten-

sion was oppressively made, he should have it in his power to relieve himself, which mechanical violence will not admit of, for alteration may be too rapid to be useful. Rejecting therefore these, I considered the hoof divested of the shoe, and moistened by grass and dews, and with a deep channel cut with a drawing knife longitudinally down the front of the hoof, that there might be the less resistance to the expansion of the sides, as sufficient. Further, however, to assist these measures, the inflexions were thinned, and the horn pared away from the sides of the frog.

Anxious for his restoration, for the reasons I have stated, I determined to spare no pains in the accomplishment of it, and turned him out to grass in the fields near Paddington; and conceiving my former experiments had failed from a want of sufficient expansion only, I determined to carry it in this case as far as possible; and attended him almost every week at grass, and continually kept thin the new growing horn, and smeared his hoofs with a compound of wax, tallow, and tar, in order to keep them supple, and prevent the effects of the wet. The frog frequently exfoliated; and it was in attending him there that the nature of these exfoliations first became known to me, as explained in the former part of this work: this part grew much larger, and the clefts and chops, which had formed from cutting and exposure to the dry air of the stable, became very slowly closed and grown out; also a thrush, in the same manner, became dried up, and ceased to discharge, and was without irritation; but the two surfaces or halves did never perfectly unite, from want of powers in the frog-stay. At Paddington, Peckham, and in various places, he was kept during two whole years, and in the winter at straw-yard at Barnet, &c.; occasionally he was rode and drove without shoes, to observe the progress and effects of the remedy, and that the weight and unequal pressure afforded by the road might further assist: but after all this, though his feet became widened, I could not discover much amendment in his going, but thought him on the whole rather the worse for what had been done. I still, however, hoped the removal

of the cause, and the advantages of it would one day appear, perhaps on its being more perfectly completed, and kept him on several months beyond the period I have stated; but at last grew so tired of the expenses, and ill success that attended it, that I determined on his sale, and it was with some difficulty that I at length sold him. The gentleman who purchased him complaining of his dangerous mode of going, I took him again, and kept him in all full three years; but finding no benefit, and rather than have this worthy creature pass through *the using up service*, I had him destroyed, though for coach work he might have brought me from ten to twelve pounds perhaps. I did not, however, yet see why the foot should not recover on the removal of the cause of the mischief.

Beginning, however, now to apprehend that the want of success was occasioned by the feet being undertaken too late, I next bought a young bay Welsh mare, that was stated to have been shod not more than two or three times; though I was afterwards led to believe from her age, which was three years and a half, and from considering the practices of the country from whence she came, where young horses are made, even at a year old, to do a deal of heavy, improper drudgery in tillage, and in conveying wood, coals, iron, &c., (which often strains and ruins them before they are even brought to market,) that she had been shod nearly or quite two years. I entered, however, with tolerable confidence on the experiment, on account of her age, and hoped to get a sound mare by it. I cut away and thinned out the horn of the inflexions, and rasped the hoofs till the blood almost appeared, pared the sole thin, and turned her to grass at Peckham; indeed, that she might have no risk in travelling, this process was performed in the very field she ran in; and after fairly trying the experiment nine or ten months, I still found the same results as in the former, for she went rather worse than better, though at first advantages appeared to attend these proceedings; and after some time her sole appeared more sunk or prominent before the point of the frog than it ought to be, and the hoof rather incurvated

in front, her step became very contracted and tender; and after nearly two years keeping, exposed to all the measures I could devise for expanding them, I sold her at a considerable loss, more a cripple than I bought her.

These repeated disappointments damped my expectation of success; and the expenses of them were severely felt; for in the removal of the cause, the remedy appeared so natural and certain, that any other than a successful result could hardly be believed: this uniform failure, however, led me more attentively to consider if some other change than mere contraction might not have happened to the foot during this collapse of the hoof, and which reflections finally disclosed the true cause of our want of success. Before, however, we enter on this explanation, we shall briefly relate the result of yet another experiment made about this time, which, as it contains some further remarks and particulars than are contained in the preceding experiments, may not be without its use; for in seeking the truth by experiment, we ought not to disguise any circumstances that occur, however contrary they may appear to our present views or wishes. We were greatly incited to this last trial by the cheap terms on which we were offered the subject of it, a stout chesnut hackney gelding, about six years old, with rather flat feet, which kind, we have before remarked, are not so soon injured by the influence of the iron. He had been from some cause or other so offended by the shoeing smiths, that he would not let one of this fraternity approach him, much less suffer them to touch his legs. When I bought him, he was not recovered from marks of violence, which he had got by being confined in a trevis; and now that mode of confinement was become impracticable, for he would not suffer himself to be blinded, or approached with a twitch, or any of the other measures used in such cases, but would exhibit the most determined resolution to use all the means he possessed of offensive warfare; if a smith entered the stable, for he could smell him at a distance, he gave warning by furiously blowing and snorting. This horse was one day inadvertently led into a

shoeing shed, by one not acquainted with his scruples in this respect, and getting loose, he with heels and teeth soon cleared the premises of every individual, who were happy enough in being able to escape his rage. Being almost useless on this account to his owner, I purchased him for about half his value, and made him the subject of a very troublesome series of experiments on a new means of shoeing; for it was become very obvious that if the expansion of the feet was effected, the application of the original cause would very soon reduce them to the same state again, that some other mode of defence therefore appeared necessary. And I so far ingratiated myself with him as to remove his shoes, though not without great caution, and some threatenings on his part; and he was kept for nearly two whole years in the stable during these trials; and if he was rode out, it was without shoes, or with those I applied without nails. His feet under these circumstances (for no particular measures were employed for their expansion) grew larger in all respects, corroborating the experiment with the Huntingdon chesnut mare already related, showing that the stable is not alone a sufficient cause for contraction; and this horse would go better without shoes than any I had before tried, though somewhat crippling and tender, and subject to heats after exercise in the feet and coronets, and would stand sweating in the shoulders and chest for hours afterwards: the expansion having been more slowly effected than in the foregoing experiments, and without cutting or rasping was, I believe, favourable to him. And in the course of making these experiments, a circumstance occurred that gave me much satisfaction; for I found if the horn of the bars, or inflexures of the hoof, was pared away and cleared from the sides of the frog, it greatly contributed to the pleasantness of his going. We should state also that the heels of this horse at length became tender, and with bruises, or *corns*, as they are called, arising perhaps, in part, from the flatness of his feet, and lowness of those parts naturally, and also from the heels, which by shoeing had become stiff, and had suffered a loss of part of their elastic provisions, were

unfitted for use; for with unshod feet, in the perfectly-natural state, which we since have had several opportunities of trying, these things did not occur: and we should also mention, as a circumstance particularly worth attention, that after some time the frog-stay split in this horse, with a dry cleft; and this at length became a running frush, and discharged a fœtid moisture, a circumstance which the more surprised me, as pressure on this part, according to the generally-prevailing doctrine of the times on this subject, should have rather suppressed than created a frush. The same circumstance also occurred to two other horses I tried that had been shod, and which I am the more induced to state, that others, endeavouring to avoid the evils of shoeing, and who may have recourse to the shod foot, as some within my knowledge have done, may be aware of the difficulties they will be liable to.

As the circumstance is alluded to in a former page of this work, we think it right to make mention of it here, that, whilst employing these removeable shoes, though often indifferently made, by our own hands, this horse never used to cut with them, though they had the appearance of danger in this respect; but on one or two occasions, for longer journeys than usual, he was shod with the ordinary shoes, with nails, with which he uniformly cut himself; and which led me to suspect that numbness from the pressure of the nails was an occasional cause of horses' cutting: for after a considerable time, this horse would permit a man, not dressed as a smith, to fasten on his shoes, if I was present and encouraged him. But some time afterwards becoming tender of the near leg, from an old strain, got probably by being put in the trevis, and from the other circumstances we have mentioned, we were induced to send him also to Tattersall's, where he was sold for about a third of his original cost.

I was now induced to give more attention to the condition of the coffin-bone in those horses that had been shod, though without much expectation of its leading to any thing important, and procured several from the slaughter-house, and macerated them so as to get them

clean from their envelopements; but from these no conclusions could be drawn, having no bone in its natural state to compare them with, and, for aught I knew, the appearance they made might be the natural one. At length, a three-year old natural bone was obtained, which gave me proof of these bones being changed materially in their structure by the operation of the shoe; and some time afterwards, through my worthy friend Mr. Bloxham, veterinary surgeon, of the Royal Guards, I obtained one that was four years old, from a horse that died with his first shoes on. The extraordinary exterior of this bone was delineated most accurately from nature by the pencil (to which I have been before so often indebted) of my much esteemed friend Mr. Sydenham Edwards, and was carefully copied in the engraving by Mr. Sansum. We may see in its surface an organization of extraordinary beauty, perhaps more so than is to be found in the bone of any other animal: see *Pl.* 7, *fig.* 1.

On the same plate is given also the representation of the coffin bone of a horse about eight or nine years old, (see *Pl.* 7. *fig.* 2,) that had been uniformly shod; and the difference of their form and surfaces will sufficiently exhibit the cause of our want of success in restoring feet. For the general figure of the bone is changed, and the beautiful organization of its surface has undergone almost perfect obliteration, that if there be any convenience or use in this remarkable construction, it is now lost.

The sides of this bone, from a wide or enlarged crescent, have now assumed a flat oval figure, and from sloping, have become nearly upright. The *patiloba*, with its exquisite configuration, is entirely lost, and the surface, where it formerly existed, exhibits a collection of ragged cells and cavities with hard sharpened edges, and which surfaces have been usually hitherto given as the natural surfaces of this part of the bone. The physiologist well knows there can be no regeneration or reproduction of a bone so diminished.

On the same plate is also seen, at *fig.* 3, a view of one extremity or *retros* of the coffin bone, having a portion of the cartilage ossified,

and adhering to its upper edge, in the way it is found in many horses after they have been shod a few years, showing the commencement, as well as the direction that these ossifications usually take in their growth, and which at length rising above the hoof to the sight and touch, are then called *ring-bones,* being found in the circle or ring of the coronet.

The general conclusions, which these experiments seem to afford us, are these:—In the two first experiments it was observed that the hoof became incurvate, or bent inwards in front, a circumstance we have since noticed very frequently with horses turned to grass without shoes, and which appears to arise from the coffin bone sinking under the weight, and dragging the hoof after it, and which, we apprehend, is occasioned by the operation of several causes. The general frame of the hoof being now unsustained by the shoe and the nails, and moistened by the dews and the wet ground, is softened, and thinned also by the rasp or the knife, gives way, and opens in all directions; the inflexions, which had been for a long time closely confined, suddenly open also, and extending, dilate the horny furch, and thus diminishes its power of support to the parts above; the shoe and nails being away, the sole also will flatten, and its *commissural ridge,* or line of union of the bar, sole, and furch, will sink, and no longer afford support to the parts above, and these will incline, or be drawn downwards; also the coffin bone itself diminished and absorbed, as we have before explained, will be forced down either alone, or bringing the front of the hoof along with it: in the one case we have a decided founder; in the other, a *pedimota,* or a flattened, or a protuberating sole, and inflected hoof.

The flattening of the sides of the hoof also, that we have observed frequently to happen if horses are turned to grass, seems to arise either from a partial descent of the coffin bone, or by a rapid absorption of the sides of the bone itself; for it would appear not improbable, that although the nails, acting by pressure against the sides of the bone, occasion its absorption, yet permit it only to proceed in a

certain ratio, depending on their application; but that after their removal, this disposition to absorption which they communicate to the foot, can perhaps proceed with greater rapidity, that is, if the hoof be rendered flexible enough in this part to fall in and follow it, than when the shoe is on. The *running to toe*, and its enlargement, may also be another cause of these parts diminishing.

In the experiment with the bay mare, the hoof, from being very much thinned, and naturally not very strong, the coffin bone descended so as to bear on the sole, creating a fulness there, and bringing on a species of imperfect founder, that the experiment is not conclusive as to the benefit that might be derived from turning out at this age, though it may serve, however, as a useful warning not to resort to the application of similar measures with such kind of feet.

The experiment with *Tippoo* seems decisively to show that three years of liberty, or nearly so, of the foot, is insufficient to do away the effects of five years of shoeing, with all the assistance that can prudently be given it, that is, if the shoes, as was his fate, have been applied at an early age.

The important conclusion we draw from these experiments and facts, and which we wish to impress forcibly on the reader's attention, is, *that after the foot has been exposed for a certain time to the operation of the iron, it becomes so much changed from its natural state, that it is more adviseable for it to remain in the diminished and fixed condition to which it is reduced, than by any measures, especially severe or coercive ones, to attempt its restoration; as any sudden or violent change appears to disturb the foot and bring on morbid affections, rather than the healthy condition of the part; so that a continuance of it in this state appears the lesser evil, or even an advance of the mischief, if it be a very slow and uniform one, is to be preferred.* Such appears the disclosure and unfolding of this mysterious matter, and which, though it may appear simple when explained, has been a most seductive and perpetual stumbling-block to people both in and out of the profession.

The exposure of the foot for a few days or weeks without shoes at grass, if the foot be strong, with a view merely to cool the foot, or remove any casual compression from a nail, is not intended to be included in the above caution; but from further exposure, detrimental effects may be apprehended. In the course of our professional labours, we have often been called to feet lamed and disfigured by turning out, and have recommended, as speedily as possible, the reapplication of the shoe, as the best resource, in order to bring back the fixed state of the foot; but for a long period after, we have seen them to go very crippling, and that accidents, and the sale of such horses have generally followed.

How long, after the shoe has been in use, we may turn out without it with good effect, remains to be ascertained, as this will depend very much upon the constitution of the foot; for the variations of the hoof are very great, and very different effects will arise upon similarly constituted feet, according to the period of life at which the shoeing commenced, and the manner of its having been conducted. Certain it is, that few think of having recourse to these measures till serious inconvenience be felt; and then it will be found, in a general way, too late to do much good; that such means cannot certainly be resorted to too early.

Those horses which have been shod, and used with expansion shoes, will better bear exposure than the others with common shoes; and with the expansion shoes, if no great allowance of motion is made, (for it can easily be regulated,) the most perfect security from injury may be relied upon, and their feet be usefully relieved.

In terminating this work, we may observe, that the facts and the knowledge contained in the preceding pages are such as Veterinary Colleges were instituted to discover, and to lay before the public for general advantage, as well as for that of the profession; but it appears that the principals, having lost their way among the briars and thorns of false doctrine, have endeavoured to keep real improve-

ments out of sight. Nor is it altogether on my own account that I have so often adverted to their conduct in this respect; but on account of a large body of men, whose interests have suffered by it, and who have been taught erroneously, and conceived prejudices in consequence greatly to their own and my injury.

False theories spread with ease, and are often more fascinating than the real truth, as she generally comes surrounded with her numerous train of circumstances and conditions; she may be said to rise as from a deep and obscure well, gradually and slowly, sifting her dubious way as she advances to the light; when arrived, however, she is a rich reward, verifying every thing she proposes, and becomes to the anxious practitioner a true delight.

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