

**Stereoplea, or, The artificial defence of the horse's hoof considered / by Bracy Clark.**

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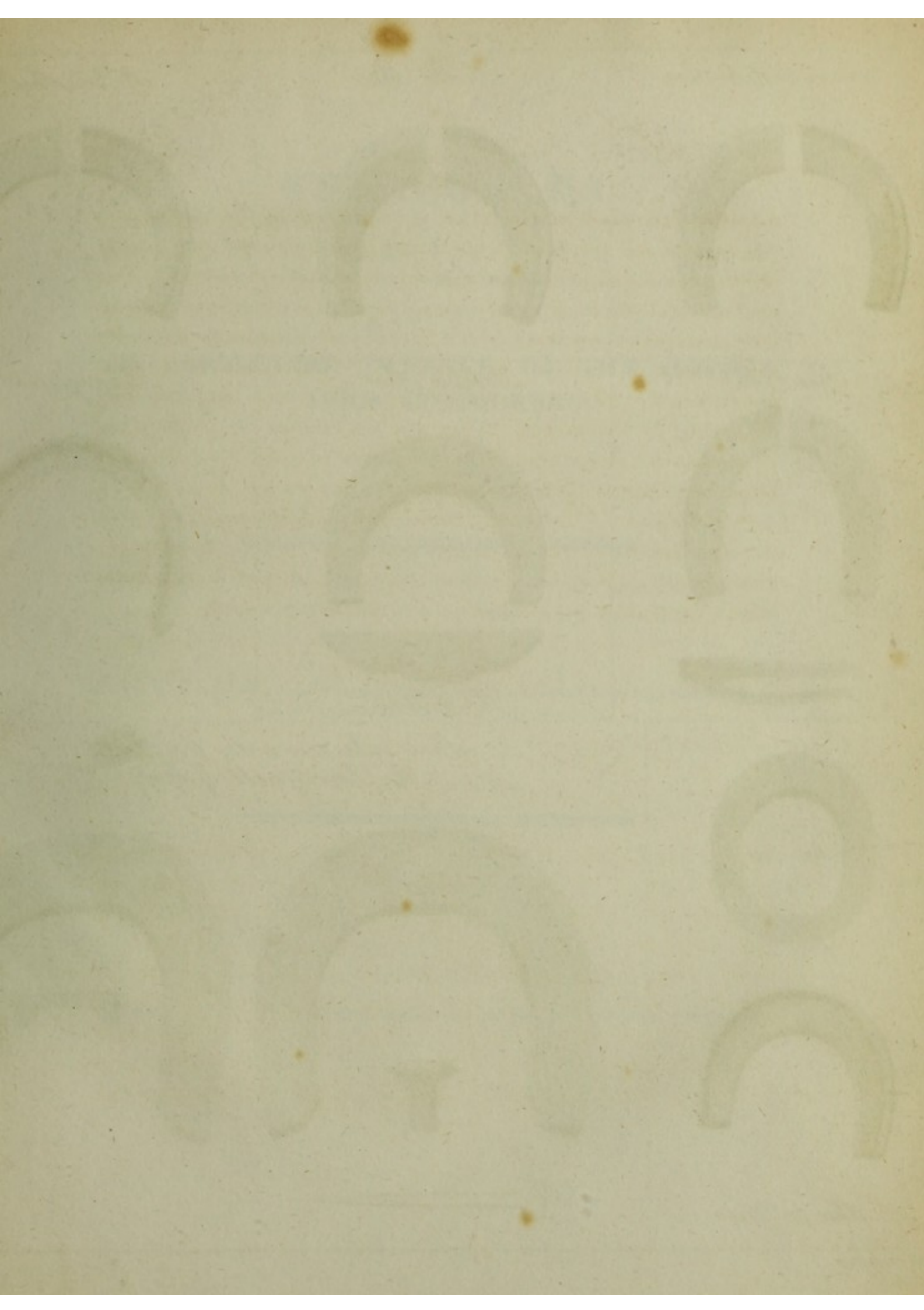
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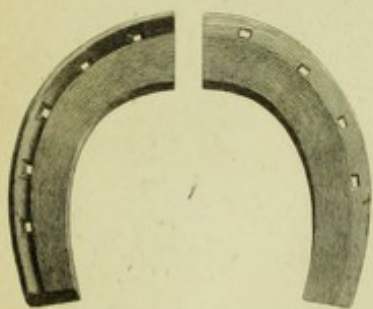
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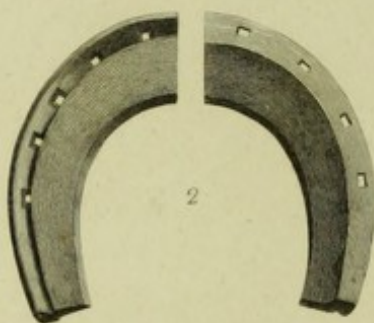
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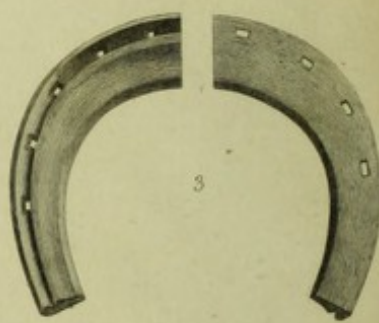
*Common English Shoe*



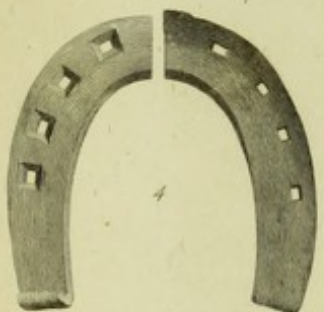
*Seated Shoe*



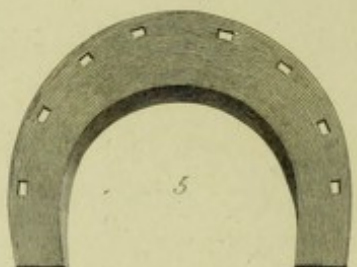
*St Bel's Shoe*



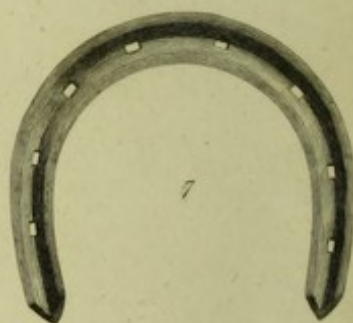
*French Shoe*



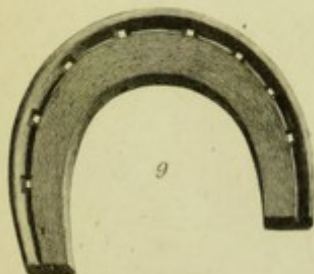
*Safepes Shoe*



*Racing Shoe*

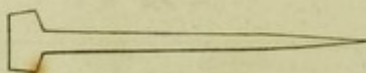
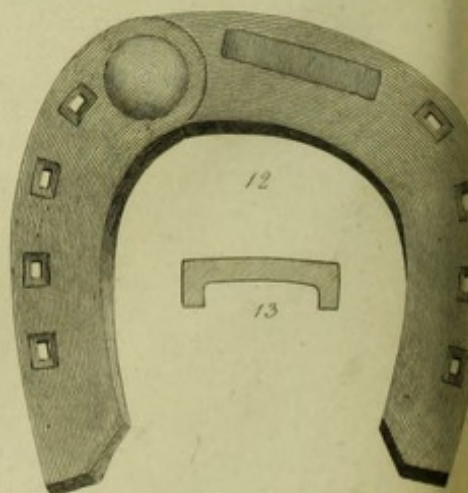
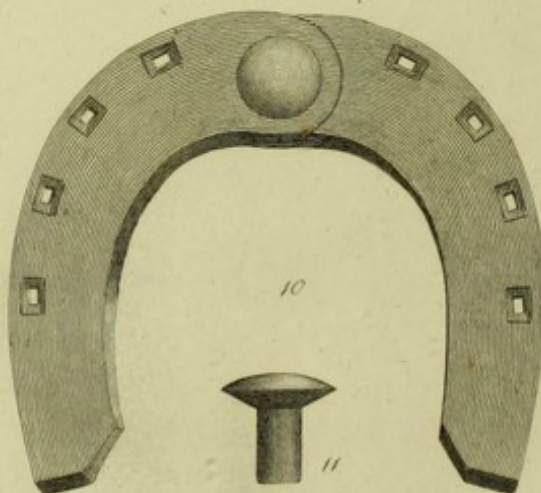


*Tip of Steel*



*Shoe for Corns*

*Shoes enlarging with the Foot.  
the Rivets made of Steel*





14

# STEREOPLEA

OR

## THE ARTIFICIAL DEFENCE OF THE HORSE'S HOOF CONSIDERED.

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BY

BRACY CLARK, *F.L.S.* CORRESPONDING MEMBER OF THE ACADEMY OF SCIENCES OF PARIS,  
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LONDON :

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1817.



STEREOTYPE

ON

THE ARTIFICIAL DEFENCE OF THE HORSES  
HOOF CONSIDERED

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BRACE CLARK, F.R.S. CORRESPONDING MEMBER OF THE ACADEMY OF MEDICAL SCIENCES  
AND OF THE NATIONAL SOCIETY OF MEDICINE

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LONDON:

PRINTED FOR THE AUTHOR AND SOLD AT 25, ST. PATRICK STREET.

1857

ON

## THE DEFENCE OF THE FOOT.

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IN a former treatise on the Foot of the Horse, published in the year 1809, I detected some undiscovered parts in the hoof, and circumstances in the plan of its structure before unknown, and especially pointed out for observation its *elastic* properties. Keeping this principle in view, I proceeded to develop the mysterious and ill understood effects of shoeing, by exhibiting the shoe as constantly opposing this natural property of the foot, whence the evils so much complained of. To render the fact demonstrable, and place it beyond mere opinion, I suggested the experiment of taking a succession of casts in plaster of paris from the same foot during a period of six years; these, compared with each other, afforded evidence enough of an annual diminution of volume in the foot. To exhibit more forcibly this train of evil, I divided the process into annual periods, though one unceasing course of mischief, describing to each the effects it produced, till the foot could no longer serve its purposes, and thus showed the real cause of what had been heretofore attributed to abuses of the smiths, or, by the more enlightened, to the want of pressure on the frog. In this present Treatise, in order to finish my labours on this branch of the art, I propose to take a view of the actual process of shoeing now used, and conclude, with remarks and suggestions for the removal of the evil, which I am disposed to believe is not very distant, and that the public are about to derive great advantages from the researches made on this branch of knowledge.

Discovering the above flagrant defect in the principle of the common shoe, I was led to consider the remedy, which appeared natural and obvious, viz. a shoe, that might be put on and off at pleasure, leaving the foot in its natural liberty, at all times when the horse was not employed in his work, and I did not see any reason for its being impracticable.

Seeing the lamentable suffering of the animal, and with the hope of being instrumental to his relief, I was urged to strong exertions. I engaged myself with almost unremitted attention during four years and upwards,



in making shoes of various constructions, that had the above property of being removable, till my health became greatly injured by the fatigue of these labours, and I was at last obliged to abandon them for a less perfect plan. In the course of the above period, I made more than forty, differently planned and contrived, and used many of them in a private way with tolerable satisfaction, but did not think them on the whole fit objects for general adoption with the public, and laid them aside, as I have stated, for a shoe of a less perfect kind, viz. a shoe nailed to the foot, therefore not removable, made of two parts, possessing motion with the foot, not constraining it; this resource, though not exactly what I wished, I preferred to the fatigue of exertions now become severely painful. I however propose, in the course of this tract, to give engravings of some of these, that they may stand recorded; they may also serve as steps to future enquirers in this line of pursuit, who, by availing themselves of them, may arrive at superior excellence

It occurred to me, at a very early period of my labours on this object, that a removable shoe of the above description, once fitted to the hoof, might be rendered very durable, or even permanent, by having a second shoe to receive the wear, screwed or rivetted beneath it; that the first expence in making such a shoe would be almost all the expence that would be required, and would be no object in a matter of such consequence, as the saving from ruin the foot of so valuable an animal; the second shoe being renewed at pleasure, at per pound of iron or steel.

I discovered also, another method of defending the foot upon quite a different principle, which might be useful, in some cases where excessive labour was not required, or where about double or treble the work more than the natural hoof would perform was required. For this purpose, I used a cap of steel hardened to the spring temper to defend the wearing line of the hoof, which extends from the toe or front parts of the foot to the middle of the outside quarter of the hoof; this defence was fastened by a brace and strap, and could be applied without nails, by a purchase on the side of the hoof, and which, as I propose to describe farther on, I shall not here enter into further particulars of.

I have sometimes thought, that horses might be usefully divided into classes according to the nature of their work, and be defended accordingly. Without extending farther these general remarks, I will now advert to the proper objects of this treatise, the consideration of the foot, and its



defence. It may, however, not be amiss just to observe in this place, that those who are sincerely desirous of forwarding genuine horse knowledge, will do well in the present state of the art to confine themselves to single objects of research; for great obstruction to knowledge is made by works embracing too much—general treatises at present are a mere abuse of the public.

On a view of the matter before me, I believe it will usefully admit of being divided into two sections or chapters. The first respects the rearing or bringing up the natural foot, in order to obtain its greatest beauty, perfection, and strength: the other respects the defence of it, in the best manner, without impairing these qualities.

Sect. 1. *The Horse's Hoof*, at its origin, or if we say at the birth of the foal, may be compared to an half-expanded rose bud, all the parts of the future foot existing in different degrees of developement; the forwardness of some in preference to others depending upon the necessities of the animal, till the whole by a gradual process become unfolded and brought to their strength.

*The Wall*, or upright part of the hoof, is first in readiness for its office at the exit of the foal, and is sufficient for his support. It envelopes the foot in a very collapsed state, and alone performs nearly all the business of the foot; for, when first foaled, the young animal has a very light carcase: that this part has not to sustain any very considerable weight or pressure, except when his own inclinations lead him to display in playful tricks before his dam his extraordinary suppleness and activity; the length of his limbs and small body give him a swiftness and springing, easy carriage, that is not surpassed at any period of his life—his bounds are such as one might imagine of some fairy being, hardly doomed to tread the earthy soil. His fetlocks straight or upright, must make his going to be very much on the toe or front parts of the foot.

The wall of the hoof at this period is somewhat pointed in front, and contracted below, being largest about the coronet: as the body grows more weighty, the lower surface of the foot expands to receive it, obviously necessary in longer continued exertions. The *Sole* from a stout membrane becomes an horny covering, and dilating the hoof, makes way for the *softer frog* to form, and at length the *frog-stay* completes the machinery; these parts not acquiring their full expansion and solidity before the fifth, or more probably not until the eighth year, along with the



other members and parts of the body. For we may observe, that the horse's height does not much increase after the fifth year, though he furnishes laterally very much after this period. How impressive these facts of the mischiefs which must accrue from early shoeing. For an account of the construction of this beautiful organ, I refer the reader to a treatise on the foot I formerly published. Suffice it here to say, that it is not a mere obtuse box, or cover of horn, for the security of the foot from bruises; but an exquisite elastic machine, to receive the weight, and to spring to every impression or effort of the animal, and even assisting his advances, by a return to its natural form. The frog in this case, it is ascertained in the above treatise, is performing the subordinate office of *bow-string* to the bow of the hoof, restraining it from too great extension; and aiding also its return to its first position, on the removal of the pressure: not a *wedge*, as heretofore apprehended, to force open the heels, which, from its being a soft part, to have performed, would have been the inversion of good mechanical principles.

The hoof, I may observe, in its formation assumes a variety of shapes, some less perfect than others, and differences in the relative strength of its parts; these defects may in some degree at times be improved or rectified by art, or the tendency to weakness, or mischief prevented from increasing, by judicious measures.

I propose now to attempt a brief description of the perfect hoof, and some of its varieties. The following is an enumeration. *The good natural Hoof and Foot. The upright or Mule Foot. The lumpy Foot, or large Hoof and little Bone. The small Hoof and projecting Coronet. The trumpet Hoof. The flat Hoof. The ribbed Hoof. The incurvated Hoof. The foundered Hoof.* There are others of less note and various mixtures. The following is a more particular account of these varieties.

*THE GOOD OR PERFECT FOOT* has the hoof nearly of a cylindrical figure, a little dilating downwards, smooth and stout, of a proportionate size to the limb and body, with a due distribution of power and size in the solid and elastic parts; *The Frog* occupying at its base about a sixth part of the circumference of the whole foot, a stout and entire *Frog Stay*, a broad elastic *Frog Band*, with dense and large *Intortional Bulbs*. *Sole* moderately concave and elastic. *Bars or Inflections* prominent and bold. *Coronet* handsomely rising above the hoof, neither bulging over nor sinking down in the Hoof;\* this part is formed chiefly by the cartilages,

\* The expression of Columella "*Coronis mediocribus*" is well chosen.



and being supported by bone of due size, completes the well formed Foot.\*

Almost any ground would suit such a hoof and foot; but dry and elevated ground I apprehend is more suiting the constitution of the horse and his feet.

*The High or Mule Foot.* This kind of Hoof is narrower than the former, and perfectly cylindrical, more upright, and in general of a harder and more compacted horn; white stripes, or broad perpendicular ribbands, are often seen with these. The frog is smaller and much raised, as is the sole more concave: perhaps the best calculated for being used, without defence of any. I have thought the chesnut coloured horses were more subject to this sort of hoof.

*The Large Lumpy Hoof.* By this inelegant, but expressive term, I intend to denote a hoof, in which the foot seems half buried and sunk as it were; this arises from the bones and cartilages being small, with the hoof capacious, and also in general thick and heavy. Horses with this structure of the hoof and foot move in a peculiar manner as though swinging a weight; and if they fall, fall desperately. This form of hoof is not unfrequent in coach horses; but is not confined to them.

*The Small Hoof and Projecting Coronet.* The hoof here embracing the foot very closely, is smaller, strait, and stout; the coronets, as though squeezed, overhang the hoof. I have thought horses rather less than the middle size, fiery in temper, and of a black color, were more subject to this make. The bones also appear too gross for the dimensions of the hoof; if any good could be done by damp relaxing situations during the growth of the hoof, one should expect this kind of foot would be the most likely to be benefited by it.

*The Trumpet Hoof.* By this I understand, a Hoof narrow about the coronet, of a rounded figure, and widening downwards conically; this sort of close embrace about the upper parts of the foot appears to occasion pain and fever: it is in general I believe not a natural defect, but the consequence of shoeing.

*The Flat Hoof.* Extraordinary flatness is sometimes seen in hoofs, and such would be rendered still flatter, and more feeble, by exposure in low, damp, relaxing situations; this kind appear to bear the effects of the nailed shoe better than others, and I believe may even in some cases be

\* The inclination of this Hoof from the perpendicular is about 33 degrees.



supported and improved by it, and it is observed they last longer than others. *The frogs* often in such feet hang low, and are large and relaxed, rottenness, crumbling, and decay of the horn, and fissures, occur in these, as also in other kinds of feet. In such cases, I have dressed the horn with the *Oxymel Æruginis* with excellent effect, applied with a brush, thereby inducing a more firm and healthy secretion of horn. The *Sulphat of Zinc* has also much the same effects, dissolved in water, in the proportion of about two drams to an ounce, the foot being kept dry in such cases. Washing with a water brush and water is also to be recommended; and the frequent anointing with tar in wet situations. In the growth of all feet, great attention should be paid to the *Frog-Stay*, as its integrity is the sure guarantee from *Thrushes*, or, if I might venture to restore again the old and proper English word, "*Furshes*."

*The Waved or ribbed Hoof.* This kind of deformity of the hoof proceeds from want of proper stability or fixedness in the Coffin-bone, which sinking in the Hoof, rests with undue weight on the sole: the *Frog-band*, in these cases, from its adherence to the skin is, in a remarkable manner, extended or drawn over the upper edge of the hoof, thus distorting and disfiguring its growth. Weakness from shoeing, sudden chills, or over exercise, usually produce it: it is indeed a *Partial Founder*.

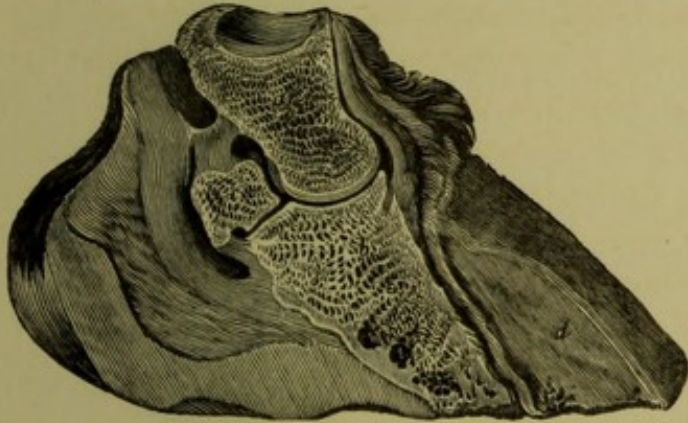
*The Incurvated Hoof.* This name is given to an hoof that is bent inwards in front, which arises sometimes from natural formation, or weakness only; at other times, I believe, from the Coffin-bone in its descent, dragging the hoof inwards along with it. Broad Shoes, and supporting the Sole, in the manner in which I shall hereafter describe under *Founder*, is the best remedy at present known to me.

*The Foundered Foot.* In the foundered foot, the connexion of the coffin bone with the hoof is weakened, or they are entirely separated. The bone descending presses upon the sole, reducing it from a concave to a convex form. A representation of a foot so circumstanced is seen in the annexed Engraving. The bones, *a, b, c*, are, the Coronet, Coffin, and Shuttle-bones. The front of the coffin-bone should be parallel to the front of the hoof; but fallen down, rests with its point anterior to the point of the frog. *d*, is a hard body, which appears composed of the processes or keraphyllous structure, rendered solid by secretions thrown out by the rent or disturbed vessels, a red serum fills this cavity in the recent founder. In a more advanced stage of the complaint, the wall assumes various forms, sometimes bulged



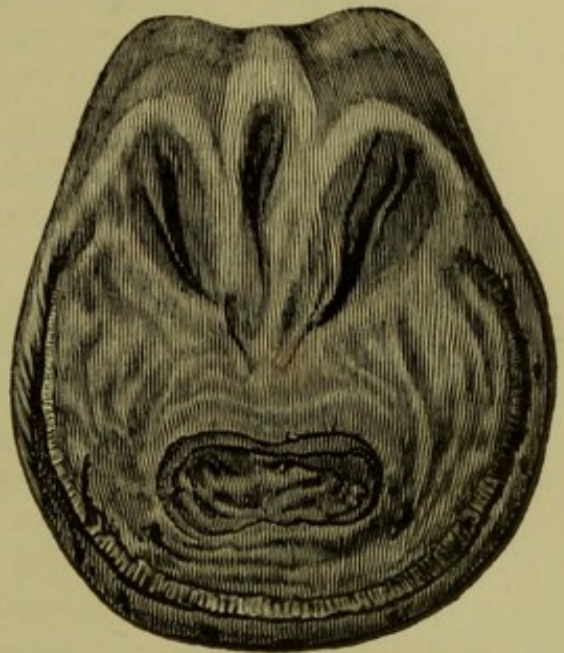
PLATE I.

1.



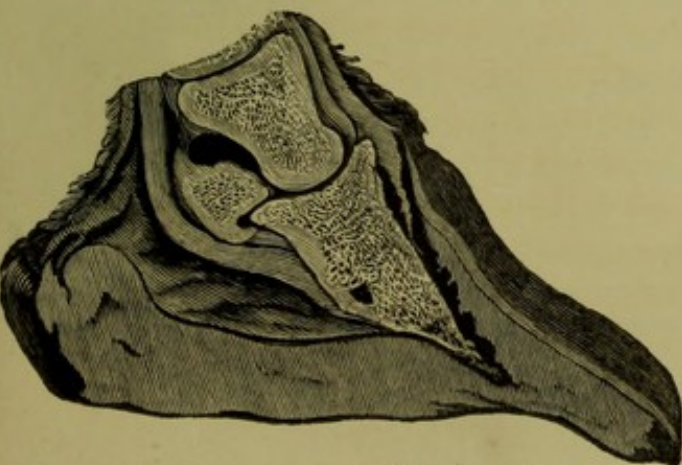
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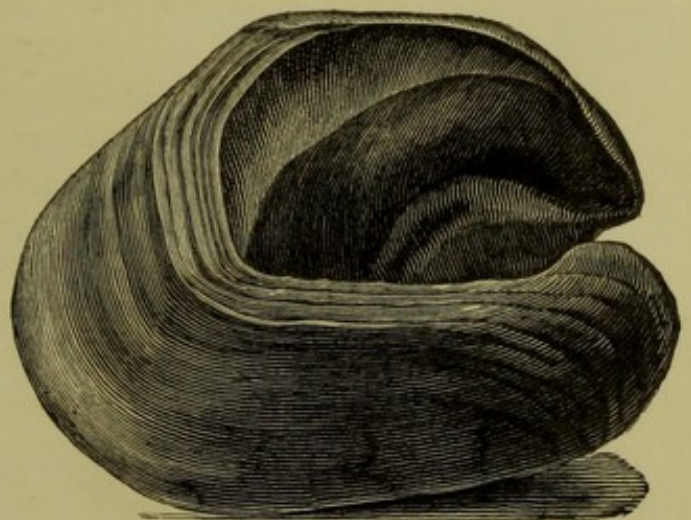
PEDICIDA, *subitanea*, recens. Recent Founder.

3.



PEDEMOTA, or Partial Founder.

4.



UNGULA PEDICIDA, *etate provector*.

100





exteriorly, and inordinately thickened, even to twice or thrice its natural dimensions; large ribs and depressed circles form about it, and its summit in a remarkable manner, becomes depressed or flattened, which arises from the curious cause we have before noticed, of the frog-band resting too strongly upon these parts.

This deformity and thickening of the wall may be accounted for by the altered condition of the *Cuticular Cavity* in the top of the hoof, which, in very old cases, is almost effaced, being rendered *wider* as well as shallower.

When founder takes place, it is known by the sunken appearance of the foot in the hoof, by the bristling of the hair round the coronet, and by a chasm or depression within the edge of the hoof, sensible to the finger, and by the fulness of the sole before the point of the frog.

The point of the frog is, as we have stated, pressed downwards in this complaint, and is fuller than it should be; while, on the contrary, the base of the frog appears to be drawn upward or internally, which at first was a difficult circumstance to explain; but is accounted for, by considering what takes place in the disturbance of the bone, that a sort of rotation about its centre attends its descent, the front parts, by receding or falling backwards, elevate the superior and posterior parts of the bone to which the base of the frog is indirectly connected. The tumid state of the surrounding parts also makes this appearance the more conspicuous. See Fig. 2. *k*.

Simon, an Athenian, the most ancient writer on this art, quoted by Xenophon, but whose work is entirely lost, "well observed," as Xenophon expresses it, "that the good hoof, when struck upon the pavement, sounded like a cymbal, and was concave." He by this plainly distinguished the healthy from the foundered foot.\*

Feet that were foundered, were called by the Greeks *μαλακοπόδες*,† or soft footed; the Romans used the same phrase.‡ It is clear, however, they used it in a more extensive sense, for any weak, flat, or ill shaped foot, and founder was confounded by them as with us till lately with such feet.

\* "Σίμων δὲ λέγει τοὺς ὑποπόδες, καλῶς, λίγαν, ὥσπερ γὰρ κύμβαλον ὄφει πρὸς τῷ δαπέδῳ, ἢ καλῶς ὄντων."

"*Etiā Simonitu recte memorat Simo pedum bonitatem prodi. Nam ungula concava solo impacta velut cymbalum resonat.*"—XENOPHON Περὶ Ἱπποκρίσεως. Ed. Francof. 1596, p. 933.

† ABSYRTUS, *apud Script. Græc. Vet.* p. 252. *et ubique.*

‡ "Molli *fula* pede."—HOR. "Naturaliter autem molles ungulæ solidantur"—VEGETIUS. *Lib. 2. cap. 58.*



The bone of the hoof, or coffin bone, losing its situation, loses also after a time its figure; its sharp edges are removed by absorption, and after a lapse of years, if the horse's life is preserved, becomes reduced to a small rounded mass of bone, resting in a cavity of the thickened sole. In this state were found the bones of the celebrated horse *Eclipse*, now in my possession, the violence of his racing having foundered him, not from his covering mares, as St. Bel used to teach us.

After long shoeing has weakened the parts which connect the bone and hoof, founder can happen from truly small causes; a remarkable number of horses were foundered in the dry hot summer of 1807, as it appeared, from the mere effects of exercise and heat.

This complaint is also often produced very unnecessarily by the interference of persons unacquainted with the nature of contracted feet, and the singular effects of shoeing upon them: they endeavour to restore such feet, by taking off the shoes, and applying wetted clay or poultices, or other relaxing things, to the hoof; by which means they indeed enlarge the circle of the hoof, but, as it opens to a certain extent, the coffin bone falls, or is disturbed, not having its usual support, and founder in a greater or less degree is the consequence; for bones cannot enlarge, it is evident, though the hoof may.\*

The appearance of the underside of the hoof is represented at Fig. 2. Plate I. where the sole is laid open to shew the position of the coffin bone; for it was sturdily asserted by the farrier, to be a *Shoulder Lameness*, till I proved the contrary, by making this opening. The retiring base of the frog, and the tumid appearance of the surrounding horn, is also seen. The cause of founder, in this case, was a servant riding the horse vehemently from a distance in the country to town, for his master's use.

Fig. 3. represents a hoof bent *inwards* in this complaint, the toe very much projecting and thickened.

Horses, which have become foundered, often put out their feet whilst standing in the stable, as it should seem to relieve themselves, by pressing upon the heels; also in going, they sometimes take long steps, and appear to go boldly, which deceives the unaccustomed to this complaint, and they mistake it for good action; they, however, draw back their feet so as to bring the hind parts as much as they can first to the ground. Their manner of going, it is true, will much depend upon the nature or manner

\* See an Essay expressly on this subject, published with the above Treatise on the Foot.



of the derangement of the foot, for some go wholly on the toe, with short steps.

It will hardly be necessary to observe, that such feet as are foundered should be carefully avoided, in purchasing horses, or such as are likely to become so. The cylindrical form of the hoof, it must be obvious, more firmly embraces the included foot than the conical shape, so the hoof of this form should be avoided, as communicating a greater tendency to this complaint from slighter causes.\*

Various other forms do the hoofs assume, which to enumerate would be tedious. One of these, however, is worthy of notice, being very frequent, "*the running to Toe*," as the smiths call it, that is, when the anterior parts of the hoof acquire an undue strength and growth at the expence, as it were, of the sides and posterior parts: it may be accounted for, perhaps, that these front parts in shoeing are left more at liberty, having no nails in them, than the quarters, and therefore do not equally suffer. This defect is apt to increase very much by exposure at grass without shoes. The inflections also with these feet are often drawn forwards and shelving under the foot.

\* As Founder is not unfrequent, the reader may perhaps be desirous of knowing what treatment we have found to be most successful. In a very extreme case, such a one as is represented in Plate I. Fig. 1. the first and least loss would be in destroying the animal; but where the bone has not been so entirely separated, as in Fig. 3. we should recommend from experience the following treatment. We apply to the foot a circular or bar-shoe of more than ordinary width, protecting the sole, and taking an extensive bearing on the ground, which appears to give great relief to the animal; an opening sufficiently large is left in the centre conveniently to admit the stopping, or about the bigness of an hen's egg.

The stopping I use, is coarse herbs or tow, soaked in water, then smeared with tar; it supplies and cools the horn, and, by using a moderate pressure, supports the sole, which greatly relieves, especially after the first stage. The stopping should be removed daily, that it may not get too dry, and also to prevent any casual pressure, that may become painful if long continued. The exterior of the hoof and the coronet should be smeared with *hoof-ointment*, a composition of Tallow, Tar, and Bees Wax, such as I formerly recommended in Sand Cracks; it keeps the hoof elastic and from becoming too dry and hard, as great heat attends this disorder. Bleeding from the coronet, as well as generally from the system, and gentle physic, in a recent case, is also necessary. Frequently immersing the foot in warm or cold water, or tying the foot in a bag, containing a poultice made of bran, or bran and fig dust mixed, adding a little grease of any kind, is useful: However, relaxation I believe may be carried too far, and the separation be rendered more extensive by it than is necessary; that the Poultice should be used with discretion. Also, in very recent cases, opening the sole to let out any confined lymph or blood is advisable; which will also prevent the horn of the sole from being forced down.

The foot thus supported will recover itself in a remarkable degree, and I have seen horses rendered serviceable to an extent, that would hardly be imagined. All sudden transitions of temperature and violent exercise, with feet so circumstanced, should be avoided, for nature wonderfully accommodates herself to her new condition. If a more scientific term for this complaint were desirable, we might call it *Pedicida*; and when partial only, *Pedimota*.



We now dismiss for awhile the subject of the foot, for some remarks of a more general nature respecting the rearing the young horse; as it must be obvious, that good feet will avail but little, without a corresponding strength in the other parts of the body. His growth, at this tender age, should not be checked or impeded: he should have a good supply of food, and neither be chilled by frosts, or lowered by exposure, to damp, unhealthy situations, which lay the foundation of incurable disorders. From insufficient food, or of bad quality, they will be subject to various deformities, as large heads, gross jaws, large bellies, gleets of the nose, affections of the lungs, &c. Exposure to keen frosts, produces ill consequences to the eyes, and appear to be the cause of a certain white glare, which I had often observed in horses eyes, but was unable to account for, till I accidentally witnessed its taking place in one of my own horses from this cause; this white suffusion resembles in some respects a Cararact, but is more generally diffused, and not of so opake a white as those spots.

My experiments upon the feet of horses, led me to purchase many at an early age, in order to observe the progress of the natural foot; and, on some occasions, my knowledge was not very cheaply obtained, for on using these young horses, I discovered that the greater number of them were lamed in some way or other in bringing up. Out of near a score that I purchased, at various times, not more than one or two were found on use to be sound, though they had never been broken in or used; this I could trace to the unsuitable nature of commons and farm yards, where the young horse, active and thoughtless, is ever running into danger, if the opportunity of doing himself mischief is not carefully removed; where many are kept together, they are exposed to the greatest risk, of kicking one another, or of having their shoulders beat in, through the carelessness of servants leaving the gates half shut, which would close upon them as they endeavoured to force their way through. Hurdles caught the legs of some; and others, by rushing through narrow doors, injured their hips; others, in the absence of their masters, had been vehemently rode; others, brutally assaulted with improper weapons; some staked; others had strained themselves irrecoverably, by chasing about in improper ground, that the hazard of their ever arriving, in a sound state, to four, or even three years old, must be very great, and sufficiently accounted for what I had experienced.



To avoid these losses and disappointments, I was at last reduced to the necessity of bringing them up by hand in my own stables, without the use of any field, or only occasionally. By this means, they were saved from violent injuries; but were subject to the defects I have mentioned already, and I observed, that their living chiefly on hay generated in a remarkable manner abundance of worms, of that species, which soils the anus with white matter, like birds dung.\* I am the more induced to mention my experiments in this way of rearing them, having at last found out a way of obviating a great deal of the above inconveniences, which may be useful to such as are compelled to keep their horses a long time in the stable; whether young or old, which was, by substituting a *large bran mash* every day for the mid-day feed, instead of hay, which appeared to agree with them particularly well. Oats, where there is much confinement, if given in any considerable quantity, is of too inflammatory a nature; though their occasional use to young horses at grass may be beneficial.

To prevent the numerous disasters of commons and farm yards, and to bring up the young horse in perfection, separate paddocks appear to be necessary, with a proper shed or hovel in each for feeding and for shelter. The most complete I have ever seen for this purpose are at Hampton Court, constructed for the stud of the Prince Regent, which appear to be admirably well adapted to this purpose. The following brief description of them may not be unacceptable to the reader.

A wall bounds the North side of this Park, dividing it from the great Kingston Road; an extensive inclosure adjacent to this wall, is divided into paddocks by strong wooden fences or partitions, placed in lines parallel to each other, and at right angles to the wall; these inclosures of an oblong figure contain each about two acres of ground.

The sheds or rather stables of these paddocks are built against the wall at every other partition and being double, each is made to serve two paddocks appearing on either side the partition. The troughs also for

\* Three or four species of Worms are found in the intestines of Horses; but one only of these appears to produce this sort of white matter, the *Trichocephalus Equi*, or *Whip Worm*, the one end being large, and the other tapering to an extremely fine point like a dog-whip, the small end has very naturally been taken for the tail, but is in reality the head of the animal. This white secretion is the juices of the worm turned to this colour after its death, the skin becoming tender and rupturing in passing the sphincter of the rectum, with the dung balls this white matter falls upon the perineum and soils it, and it is usually imagined the excrement of the worm. The other intestinal worms produce, I believe, no appearance of this sort.



water appear on each side of these wooden fences, so that water poured into them will serve both paddocks.

A transverse partition is thrown across the paddock at a little distance from the stable, by which a convenient stable yard is formed for enclosing them in, if necessary. The racks and mangers of these stables are of the most simple construction, that the colts, however wild, cannot hurt themselves with them; the doors are made of a good width, and the door posts are provided with rollers turning on an axis perpendicularly, that the young horses rushing into the stable should not hurt their hips or shoulders. To pass with safety from one paddock to the other, double doors are also provided in the partitions with a space between them, that the horses should not rush through, one door being closed before the other is opened.

On the opposite side of the Kingston road, in Bushy Park, are also similar plots of ground partitioned or walled off, but considerably larger, for the brood mares, each paddock containing about three acres of grass land. By such an arrangement, horses may be reared with tolerable certainty and perfection, and the expence and trouble will be amply repaid, as well by the superior value of the horse, as by the satisfaction that must attend his use.

After this digression, we conclude the chapter, by again reverting to the Foot, in observing what may perhaps appear almost unnecessary, that there is little cause for interference during the growth of this part, as nature will best perform her own work, a broken hoof may require to be rounded with the rasp, or a weak frog may want the dressing we have before described, but he that does more, may do mischief: this I speak in the painful recollection of an instance of shameful ignorance in a Veterinarian, who officiously cut out the feet of a numerous stud of young horses belonging to a Nobleman in Devonshire, in order, as he stated "*to open the heels:*" the consequence of which was, that many of this stud became miserably disfigured and foundered. For the Foot will best extend of its own accord, and the contracted state of the colts foot has no relation whatever to that which proceeds from the effects of shoeing.

This present division of the subject, which relates to the raising the foot to its greatest perfection, might, by way of distinction from other matter respecting this part, usefully receive the name *Eupodologia* or *Eupodology*, from *ευποδος*, beautiful footed; and the next section as it



relates only to the defence of the foot, may be termed the *Stereoplic Art*, from στερεω, to strengthen; and σπλη, the *Hoof*; instead of the present delusive word *Shoeing* which except merely in being a defence, has no relation to our own *Shoes, made of Leather* and yielding to the foot.

Sect. II. *Stereoplea*, or the *Stereoplic Art*, is the art of protecting the Foot of the Horse from the abrasion and wear of the roads, and of securing the more tender retiring parts of the hoof, as the sole and frog, from too frequent impulse with the ground, by which they would become tender.

The practice of this art has remained from its origin in great obscurity, from the want of a knowledge of its general principles: occupied necessarily by the laborious and uneducated classes of society, these were content, if they afforded the requisite protection, without regarding the ultimate consequences of it, nor understood that their system was opposed to nature's chief law, in the elasticity of the foot, and was therefore grievously defective in principle. Other causes operated also to throw a veil over this art, we may with truth observe, that the decisive and overawing manners of the votaries of the Race course, and of the Chace, and their dependants, have tended much to suppress useful investigation and intimidate the more circumspect and reflecting part of mankind from considering this subject. In the school of Newmarket was supposed to centre all horse knowledge, and these assumed a sort of exclusive empire over these matters, yet during a period of not much less than three centuries not a ray of light has ever emanated from this school. Had these votaries of the turf known more of the real nature of shoeing, they would early have perceived a truth of no small moment in the conducting their affairs, viz. how very uncertain must be all their bettings, and how insecure any opinions formed from a physical view or consideration of the animal, whilst his performance was subjected to the incalculable controul and effects of an art so precarious and pernicious as this of the feet has now been proved to be. Much opposition also has attended the little advances of knowledge which this art has lately received, owing perhaps to its having proceeded from a quarter it was not looked for; as light that breaks in from an unexpected part of a building is not so well received, as when it comes through openings from whence it is most expected and desired (but such is generally the progress of it)—had it come from Newmarket, its reception perhaps had been different. It was also generally imagined, that by some knack or device in shoeing, all horses might be made to go universally well,



and that the perfection of shoeing would consist in the disclosure of this—unwelcome therefore would be the intelligence, that in the very principle there was a defect that was the cause of bad going and which, must be overcome also as the only sure road to general improvement. I am led to believe there is about to spread itself a more correct and more simple way of viewing these affairs of horses which will be greatly to the public advantage and relief of the animal: his services will be more gratefully felt, and he will be brought into more extensive use; and his life will be protracted to a longer period, in greater comfort, and freedom from violence, and the simplicity of his management be universally admitted; for no animal can be more tractable or willing in performing his labors than he is generally when entirely free from undue restraints or the persecution of destructive artifices, which entail the most vicious consequences.

Some persons have been led to apprehend, that as the modern shoe was proved to be defective, it was the design of the author, that all horses should go entirely without defence; an idea never entertained by him, on the contrary it is believed by him, that the defence of the feet of horses, when done upon good and sound principles, will afford to all posterity a useful branch of profit to the industrious mechanic, as the making of human shoes does at present and is likely long to continue so to do.

### ON MAKING THE COMMON HORSE SHOE.

Whether the present mode of shoeing shall be continued hereafter, or shall give way to improvements more congenial to the character of the foot, it is essential in a treatise on the art, that the actual mode of its performance should be described, slight differences will prevail in different places and by different workmen, but the general manner of doing it will be the same, and which it is my purpose briefly to notice.

On *Forging the Common Shoe*. The Forge of the Smith for this purpose should be provided with iron in bars of various thickness, that he may by selecting such as come nearest to the size and strength required, fit the foot with as little labour and loss of fuel as may be: at other times economy also renders it expedient to form them out of the old shoes, both of which processes we shall succinctly describe.

It is also a convenience to have a large assortment of Shoes ready made, either hanging to view upon the wall, or disposed on horizontal bars



in a recess or magazine, the advantages of which in one constructed by me I have long experienced, the shoes by being placed on bars horizontally can be readily removed, more easily than when placed resting upon one another perpendicularly, as we usually see them.

In forging the shoe from the bar, a piece is to be cut off somewhat shorter than the intended shoe to allow for extension under the hammer, and that there may be as little waste as possible by cuttings from the heels when the shoe is finished. Two or three of these pieces may be placed in the fire at one time to save fuel. With saddle horses, however, it is an expeditious as well as more correct method to divide or cut the bar into lengths or pieces forming pairs according to the sizes required; the iron for these shoes not being very stout, there is no difficulty in turning it in the tongs over the bick with the hand-hammer; but with the heavier cart horse shoes, it is usual not to cut it from the bar till a circular figure is given it, for which the bar itself serves as a powerful and convenient handle. The iron having received the requisite curve is cut off, which is then termed a *Mould*.

It is usual for the workmen to finish the outer limb of the shoe first, which being roughly formed, and the web thinned and hollowed, is commonly reversed by the smith, that is, the hammered side is brought to the anvil and that which was next the anvil being more smooth and of better appearance is made the bottom or underside of the shoe.

The shoe is then *fullered*,\* that is, a deep groove or channel is driven round it at a small distance from the outer edge, indenting it nearly half through the thickness of the iron.

The fullering prepares it for being perforated for the nails, and renders the shoe a little wider without adding to its weight; the hind shoes for saddle horses are not often fullered, at least only on the sides, nor are the shoes of cart horses; in France and Spain they do not fuller any shoes, not even for nag horses, but a stout square Stamp is driven deep into the iron, and the perforation is then completed by the finer point of the pritchel.†

This channel or fullering certainly gives the shoe a lighter and neater

\* Derived from the tool used, which is called a *Fuller*, being a sort of chissel about four inches long and two wide, flat and almost concave on one side, convex and rounded on the other, and circular below on its cutting edge; held in a rod of azle.—See also Part 2. p. 96.

† The Pritchel is a shaft of iron steeled at the end and drawn out to a fine square point. To *pritch* the shoe, in technical language, is to perforate it.



appearance, and protects the heads of the nails from wear, but not better than the square countersink of the stamp if so well; it has however this advantage, that the holes can be made nearer to the outer rim of the shoe; in the French shoes therefore the holes are stamped much farther from the outer edge, as there would be danger of bursting the metal if they approached too near the outer edge with a coarse stamp; it is apprehended also, that the fullering gives the workman more latitude in inserting and driving his nails, which with us in England are brought out higher up the hoof than in France, which we have already stated in Part 2

The outer limb being finished, the inner limb is next formed, somewhat narrower and finer than the outer, that is straighter and less projecting exteriorly; the nail holes are also more carefully worked near the exterior edge, and are made smaller, nor so near the heels or inflexions of the hoof, and with four holes only instead of five, the number usually made in the outer limb.

Also in forming the nail holes, attention must be paid to the direction or sloping of the hoof, those near the toe or front of the shoe should be made inclining backwards; and those at the quarters or sides of the foot more upright, otherwise it is obvious, that the nail cannot be so well driven into the hoof, and must finally bend to accommodate itself to the shoe.

In the working up of old shoes, or such as have been worn out, one and the half of another usually serves to make a new shoe: for this purpose, the shoe being broke or cut asunder, the half is laid on one side of the intire shoe, which is then turned or lapped over it and they are welded into one mass; the middle of the quarter forming the toe of the new shoe. The hind shoes in general are made in this way of the old shoes, these not requiring the same regular or neat work as the fore shoes. We may indeed remark here, that the hind shoes though in many respects the same are of a very different character to the fore shoes, being made much stouter at the toe and straighter on the sides, and in general not fullered; in this the natural construction of the feet seem with propriety attended to; for it has been shewn in a former part of this work, that the fore feet are broader, flatter, and more elastic, for the repose of the weight of the animal, and the hind, stiffer, upright, and less yielding, for impelling the body in swift action.

The two surfaces of the web of the shoe will admit of much variety of figure and degrees of width, which will not constitute a change of principle.



as has been vulgarly apprehended, but those made concave next the foot and flat below are with good reason preferred for most feet; a wide web also is advantageous in giving protection to the sole and an extensive bearing upon the ground, which appears to impart ease to the animal. In confirmation of this, I remember in the early part of the establishment of the Veterinary College, that the shoe was considered as a mere defence to the wall to prevent its wearing or splintering, and the shoes were ordered to be made accordingly, not much wider than the wall, by which they would be rendered lighter; but they were soon laid aside, being found very uneasy to the horse. As to the figure of the web, if it does not touch the sole or approach too near it, any form is admissible, but the above is perhaps on the whole the best.

In the next place, *the Pritchel Burs*,\* and *Bumps*, in the upper surface of the shoe are to be removed and levelled, that the circumference of the sole immediately within the wall, which the smiths call *the Vein*, should not be pressed upon; lamenesses from this cause I have been witness to, and on the removal of these roughnesses, the horse has gone perfectly well again.

The shoe being made flat is then presented to the foot; the French and Spaniards however give it a curved figure, slightly turning up the toe and heels, which is more conformable to the natural foot, but there is a difficulty if the flat form is once departed from, of accurately fitting the shoe to the foot, which much practice however may render more easy than would at first appear.

The French also not only make their shoes more cupped than ours in their upper surface, but they beat up the iron round the outer edge of the shoe, perhaps to save the hoof from splintering, and for assisting the nails. Their horses are also believed to go more freely, and to be more firm footed than ours; it would be a proper object of enquiry to ascertain, whether this difference proceeds from the shoeing, or the coarser nature of their horses feet, our horses in a general way having more of the blood than theirs, are more elastic in their hoofs, and therefore suffer more from the effects of the iron.

Their shoes are lightly turned down at both heels, making their *crampons*, which made larger and stronger with us for the cart horses, are

\* *Burs* are splinters about the edges of the holes; and *Bumps* elevations of the metal condensed by the pritchel.



called *calkins*. These, by preventing the frog from coming too often to the ground, must be evidently advantageous; as well as rendering the foot more fixed. In their shoes for nag horses, the web is as thick or thicker than the external rim, and by the general cupping of the shoe, is brought so low as to take the ground first, as is generally the case for the same reason, with our draught horse shoes. Their nail holes are nearly square and particularly large and coarse, and the pritchel burs carelessly left. Whether their nail holes being large, and the shank of the nails small, may not perhaps afford a degree of movement that may be useful in relieving the foot and in part account for the greater ease of these foreign horses. Certain it is, that our smiths and veterinarians have been studiously employed of late years in making their nail heads conical wedges gradually diminishing into the shank, which must impart the most immovable kind of barrier to the foot that can be made.

*To prepare the foot for the shoe*, the wall is reduced by the knife to a proper length and levelled with the rasp; the toe is shortened; loose flakes of exfoliating horn are removed from the sole, and this part thickening from the use of the shoe, requires sometimes to be thinned. The frog should on no account be sliced with the knife, for the horn of this part is never too thick for its defence, and has the power of ever maintaining its proper form, even suffering rags to remain, will do less harm, than admitting on any pretence a departure from this wholesome law.\*

In paring out the foot, the smith is led by the fresh appearance of the sole to judge when it is cut enough, or by the pressure of his thumb, if he finds it yield to the impression. With sunk and foundered feet and such as run much to toe, it is prudent to be on the safe side of not paring enough rather than too much, as such feet easily deceive the inexperienced.

It is generally apprehended, that the level of the horse's foot at bottom when prepared for the shoe ought to be the level of the horizon; this does not however appear to be exactly true, for if you keep cutting away the sole till the foot held upwards appears level to the eye, you will arrive at the blood on the inner side before you do on the outer, from the sanguiferous parts being lower on the inside, as we have before stated in describing the hoof. It therefore appears that the foot should be rather higher on the inside and lower on the outside, when placed on the ground consistently with the views of nature. This circumstance of the sole not

\* See the history of the *Frog* in the First Part of this Work.



not understood, is the cause of the inside of the foot being so often bruized, and with corns, more frequently than the outside. The sole is also generally hollowed out a little, round the whole circumference of the foot, to prevent the possible risk of a contact with the shoe. To ascertain the bearings of the shoe, it is usual to warm the shoe, hot enough to scorch the horn, and the points of contact are then removed from the foot, by the knife, or beat out of the shoe, or both, till a level, uniform, bearing is obtained; a view of this practice has afforded ample opportunity for declaimers unpractised in the art to accuse the smiths of burning the feet, and of attributing the evils they experienced to this cause, which, though it may sometimes be abused, is comparatively of no signification, compared with the evils we have exposed.

For the different kinds or varieties of these shoes, we refer the reader to the enumeration in the Second Part of this Work, and also to the annexed Plate.

*On fastening the Shoe to the Foot.*—The shoe being prepared and properly fitted, passes into the hands of another workman, called the *Doorman*, who holds a subordinate place to the *fireman* or maker of the shoe, and also receives less wages. He however in making the shoe, strikes to the fireman, acting under his guidance and direction.

The nails for shoeing horses, as they are received from the hands of the manufacturer, are soft, without any point, variously bent, and totally unfit for use, till they have passed through a process, requiring some slight and dexterity, called *Pointing the Nail*; they receive for this purpose a smart hammering from the hand of the doorman, on an upright steel-headed shaft, termed *the Stake*, beginning at the head of the nail and continuing it along the shank on both sides and edges to its extremity, which is then drawn out to a clear point. By this means, the nail is rendered hard and stiff, and its surface smooth and polished. But of as much or more consequence than this, is, the figure which the point of the nail is made to receive, for, after it has been drawn to a clear good point, the workman gives it a final stroke, obliquely directed over, or upon, the very extremity of the nail, so as to impart to it the figure of an inclined plane on one side, leaving it perfectly flat on the other. This bevelling of the point of the nail is of the greatest use in driving it, giving it always a tendency to pass out of the hoof, from the bevel being placed next the interior of the hoof, which facilitates the process of shoeing very much; and greatly diminishes



the risk of pricking the horse, for the foot being softer within than it is externally, naturally draws the nail in that direction.

The nail mostly used at present has a long conical head, with a view of fixing it tight in the shoe; and the pritchel point is directed to be made of the same figure, that it may be the more firmly fixed.\* We are led to apprehend that this extreme fixedness and solidity of the nails is adverse to the ease of the foot, and are disposed to prefer the old nail with a square obtuse head, abruptly rising from the shank; by which the hoof has some chance of being less restrained, and the shoe as to firmness, will be firm enough on, for every purpose. This nail, we believe, has been sometimes called the *rose-headed nail*. Where the conical nail is used, if the head be very long, part of it is apt to enter the hoof, and distending it, must add considerably to the compression of the interior of the foot.

The shoe being well fitted, as wide, or little wider than the hoof, and brought to an equal bearing every where round the wall, is presented by the doorman to the foot for nailing on; the first nail usually driven is one near the toe, on the side of the foot next the right hand of the workman, as presenting more commodiously to the hammer; this may draw the shoe out of its place, which is again adjusted by a blow or two of the hammer on the projecting side, bending the nail or forcing the hoof, or both; the second nail is then passed through the hoof on the opposite side, which renders it in a degree fixed; the rest are then driven pretty much indiscriminately, smaller nails are however used near the heels or inflexions, on account of the horn being thinner. The presentation or planting the point of the nail first in the hoof, in order to give it a proper direction for driving, is called by the smiths *pitching the nail*; this is done with the finger and thumb, and on its being judiciously chosen, the success of driving the nail, it is obvious, will much depend: in giving the first strokes of the hammer, they strike not on the flat part of the head of the nail, but on its exterior edge, and when safe in the hoof, or nearly home upon the flat head, the smith is led to judge by the sound, as also by the resistance the nail makes to the hammer, whether it is in its right course or not, and he aims to bring out the nails as nearly at equal distances as may be, round the hoof, and at equal heights up the hoof, the accuracy of which exhibits the workman: on the first entering of the nail he proceeds with caution; but

For a figure of this conical-headed nail, see Professor Coleman's Treatise on the Foot and Shoeing, Part I.



when the point is felt by the finger, or makes its actual appearance, he strikes more boldly till the head is driven home to the shoe. The nail having passed through the hoof, the shank or extremity of it is next turned down and bent against the side of the hoof for safety, that the horse in struggling or suddenly withdrawing his foot should not tear the clothes or wound the thighs of the workman. In England, it is usual to see the door-man perform the nailing on of the shoe by himself, unless with very heavy draft horses, when he gets assistance; but in France I observe two are generally occupied with this, one to hold the foot, and another to drive the nails; and sometimes I have seen the smith's wife take a part in the labor, by holding up the foot of the horse, while the other, nails it on: and in Holland also, I noticed, that the greater number of horses, in order to their being shod behind, were placed in a trevis and the hind foot was lashed to the post.

The nails being driven and turned down, he next proceeds to give them all round a good smart hammering upon the head to fix them more firmly in the shoe, and by holding the pincers to the shank of the nail draws the shoe tighter against the hoof; this done, he wrings off the shank or point of the nail and files the clinches with a rasp to an uniform length, filing away also a little of the hoof that they may lie the more closely. Now, by reversing the situation of his pincers and hammer, and holding the former against the head of the nail, which prevents its return, he beats down the clinches with his hammer and forces them into the hoof. The clench is in part imbedded in the hoof; but if any part projects, or there should be any irregularities, they are removed with the rasp, and the process is completed. They then very commonly proceed to rasping away the exterior of the hoof, to renew its surface, and give it a fresh appearance, and by which they unwarrantably remove its very necessary cuticular coat; a proceeding that ought always to be dispensed with.

Such is the detail of the actual practice of this art of shoeing horses, which, as we set out with observing, "is in itself sufficiently simple, as a view of the process would show, and also the fact of the facility with which it is acquired;" but, faulty in principle, its pernicious consequences ensue sooner or later, which the smiths, or indeed veterinarians, were never before led rightly to consider or comprehend.

I shall now turn my attention to a new and more agreeable subject;



with what success, remains to be determined, viz. The consideration of the plans or resources which can be resorted to, for the removal of these evil effects of the Shoe.

*On the Powers of the Natural Hoof in respect to wear on the Roads.*

THE noxious effects of the common shoe being clearly manifested, it became a point of some interest, to ascertain accurately what services might be expected from the natural hoof, and what it was, and what it was not capable of, on our common roads, both paved and gravel. I was the more led to this enquiry from observing the fact, that the ancients never in a general way shod their horses, which is now admitted to be decisively proved, and yet accomplished by their armies such extraordinary feats. In respect to swift riding also, Gibbon has mentioned, on good authority, a remarkable instance of speedy travelling with them, which nearly equals any thing of modern times, with all the advantages of shoes. In the first chapter, of his first book, giving a general view of the state of the Roman empire in all respects under the Antonines, he is led to notice their roads, and observes, that one *Cæsarius*, a magistrate of high rank, in the time of the *Emperor Theodosius*, rode post from Antioch to Constantinople, a distance of seven hundred and twenty-five Roman miles; or six hundred and sixty five British miles, in six days.\* Our surprize will be considerably lessened, when the means which they used of doing this are pointed out. For, the Roman roads were wide causeways, raised in the middle, and covered with large flat stones nicely jointed, and sometimes cemented together; these roads or causeways passed in nearly straight lines through every country subjected to their power, proceeding from the *Forum* of Rome as from a common centre.† Post-Houses for the purposes of the Government were erected along these ways, at the distance of every five or six miles, each provided with forty horses; these frequent relays rendered the accomplishment of the thing not difficult without much cruel exertion on the part of the animals. The horses hoofs it may be remarked would be very little worn, if the surfaces of the stones were kept clean, and the joints in

\* Codex Theodosianus, Lib. 8. tit. V. Vol. 2. p. 506. Libanius Orat. 22, and Itineraria, p. 572, 581. Procopius in Hist. Arcanâ, c. 30. † Bergier, Histoire des grands Chemins de l'Empire Romaine, Lib. 2 cap. 1. 28 and Lib. 4.



good repair; and the hoofs on such a pavement must have had an extraordinary sound, which I apprehend suggested very naturally to them the epithet, *Sonipes*, for the Horse, so much used by their poets,\* and of which our present roads made of loose stones and gravel, can afford us no adequate idea.

That it should not longer remain, matter of conjecture merely, what a horse could perform with his hoofs unprotected on our ordinary roads, I made numerous experiments with different horses at first with feet that had been shod, mistaking them for natural feet when their shoes were taken off, as always had heretofore been done; but finding them soon become tender, not from wear so much as from expansion, having been so long locked up and changed by the iron, which we have more fully explained in another part of this work: I therefore procured for the experiment a young horse at three years old, that had never been shod and kept it till four, when I made the following experiment, which I copy from minutes made in the course of the journey.

Ninth of the sixth month (June) 1811, I left London in the evening, for Bath, and rode this young mare without any defence to her feet as far as Brentford that night; the roads were in most places a very deluge of mud, almost fetlock deep, from rains which had fallen several days preceding; she carried me a brisk trot the whole way.

The next morning I left my late esteemed friend JAMES KIDD's house, about eleven o'clock, having first examined the state of her feet and found them not much worn, and that principally at the toe, or wearing line, the heels not having suffered hardly at all.

With a view to prevent the wet from getting into the horn so easily, as the roads were very dirty, I covered the under surface of the wall and sole with bees wax, melting it in by the application of a woman's ironing iron, as a substitute or imitation of the bituminous compound, which the ancients appear to have used for the same purpose, and which they called

\* *Insultans sonipes, et pressis pugnat habenis. Æneid. Lib. XI. l. 600.*

*Quo sonipes ictu furit arduus, Æneid, Lib. XI. l. 638.*

Intended as a contrast to the above sound is, perhaps the following phrase—"cavatque."  
*"Tellurem, et solido graviter sonat ungula cornu."* Georg. Lib. 3. v. 86. At first this would appear absurd that there should be any sound at all on soft ground, which the foot could excavate; but on turf, and at pretty full speed, there is heard a heavy obtuse pounding sound, which is what the poet I apprehend would wish to bring to our imagination.



*allium* or *allion*, and which, as it was not in any sense a shoe, could not affect materially the inductions of the experiment. Choosing the driest part of the road, I arrived at Maidenhead about two o'clock, for in all my experiments I found it made a very great difference indeed, whether the roads were wet or dry, the foot sliding about in the wet caused the wear to be greatly increased, in coming to the ground, the foot would slide forward, and in leaving the ground backward again, which the dry ground, by retaining the hoof firmly at once, did not occasion; this farther extension of the journey she did without material inconvenience; but her feet by the wetness of the road were rendered very supple, so that their expansion at the heels and quarters was rendered plainly evident to the eye. She also, with nearly every horse I ever possessed, favoured the near leg: this appeared here to arise from an injury done to the point of the shoulder from a kick, or some carelessness or negligence in her bringing up, from gates or doors left half shut, or violence of some kind. The frequency of the near or left limb being affected more than the right, I do not undertake to account for; but notice it as a remarkable fact.

wish to attract people's attention to these objects in buying young horses, and put them on their guard, as they are led to suppose from their youth that they must infallibly be sound, and surrender their understandings too easily on these subjects.

As I had in view, in these experiments, the restoration of my injured health, as well as the experiments themselves, so I often dismounted in the course of the journey, and walked by the side of my horse, to relieve myself, and to observe various things I wished to know. In doing this I was led to remark the natural and unconquerable dislike that horses have to being led by the head; persons ignorant of this, are often offending their horses, and by endeavouring to enforce obedience in what seems so simple a measure, get completely foiled and out of humour, and employ perhaps a good deal of unmerited abuse; for, the more the horse's head is pulled, the more disposition does he exhibit to run back; the pressure of the headstall upon the foretop is perhaps one cause of this, and also perhaps from its being the very opposite means to what he has been taught to move forward with, and the bits in the mouth acting against the upper, instead of the lower jaw. He soon was taught to follow me, or run agreeably by my side, by keeping always a slack rein, and with a whip behind me in my left hand having a lash of some length, with which I could, without his



seeing it, reach him behind; this never failed in producing the effect of making him run forward, till he became habituated to it, and then it might be omitted and the word be frequently used instead. It often happens, when men fail in getting the horse along by pulling at the head, that they raise the whip in his face, which has always the effect of increasing the dislike and making him run backward, in which situation he can have no command of the horse, and unable to do any thing further, is fairly beaten. I mention this little circumstance to the reader, as the knowledge of it may, under some circumstances, render a journey not performed in great haste more agreeable.

I got to Reading that evening, being about forty miles from town, without suffering inconvenience, where I slept; the roads had began the latter part of the day to get dry again. However, the next morning a heavy thunder shower wetted them again, and in going out of Reading on the stones she was not without sensation; the wet occasioning the foot to slide about, increased the wear, and was unfavorable to her. And amusing myself on the road with a slow pace I reached Newbury before two o'clock, and on examining her, found her toe shortened to a degree that made me apprehensive; still she went tolerably well and without much signs of favoring them, so I proceeded on my journey: the heels I found had suffered very little, which, as being considered more tender parts, one should be led by *a priori* suggestions to be more apprehensive of; indeed, I found from this and many other journies that I made without shoes, that the toe can be worn to a surprising degree of shortness before much tenderness is felt, and the sole at this part I have also thought is stronger and harder than at any other part of the foot; the wall at the heels or inflections still projected below the sole. Where the ground was very loose and soft, especially if wet, it appeared to be collected by the concavity of the foot, and a pressure and condensation of it seem determined towards the centre of the foot, supporting the animal, and saving the wear of the hoof; from this focus of pressure in the centre of the foot, I have seen the water collected squirt out with considerable vehemence. The bars or inflections will oppose very usefully a too considerable condensation or pressure against the lateral softer parts of the frog in these cases.

On leaving Newbury, after dinner, the sharp flint stones of the street made her feel a little; and after this I noticed, that if she trod on a stone in front of the foot, she flinched otherwise on the soft sandy roads she still



went tolerably well, and I kept on with her till we reached Hungerford, often dismounting and walking by her side, for her own as well as my relief. I remained at Hungerford the night, and examined particularly the state of her feet: the wall was become extremely short at the wearing line, that the sole at that place must have taken the chief pressure. It was in observing this fact, that the wearing line suffered very disproportionately to the other parts of the foot, (which from mere dead pressure did not wear away so fast,) that I was led to apprehend a defence of this line could be resorted to without the use of nails, which would double or treble the use of the hoof, and enable many to have the gentle exercise that health or amusement only required, and save their horses the persecution which the common method entails, by using a kind of *steel ferril*, which could be held on by embracing the wall on the inside as well as the out and which being a totally different principle from the shoe, I termed *the Paratrite*, which I shall describe more particularly hereafter.

After washing her feet in cold water to cool and harden them, I left her for the night, and the next morning early, tried her on the road, and found her to go better than on the preceding evening; the weather was become fine, and the roads drier. I reached Froxfield to breakfast, and with some difficulty and great attention to her road got to Marlborough, and thence to Calne to dinner, where, as the horn was now become very thin, and the casual pressure of a stone might injure, or perhaps fracture, the coffin-bone, I thought it most prudent to desist from farther pressing the experiment. On the Downs, however, she galloped on the sward without inconvenience, or any particular expression of feeling; no doubt, from the general bearing which the foot would here take upon the soft carpet of the herbage, and the absence of stones from contact with the wearing line.

I left her at Calne and proceeded to Bath, now only nineteen miles from me, by the coach; so that she had performed eighty-eight miles with unprotected hoofs. After three days I returned, and brought her with me to Bath, and used her there for some weeks in various little excursions.

It will be seen therefore that the hoof of the horse even at four years old is not so poor a defence as many imagine; for many stable men and smiths are almost frightened at the idea of going from house to house without shoes. Yet, although the natural hoof will do much, it is also a truth, that to obtain the full services of the horse, and all the labour which the strength of his body permits him to give, his hoofs are insufficient without



without protection. Had the weather been fine, and the roads dry, and her hoofs consolidated by a six years growth, she would have performed, I believe, this journey with ease; for the hoofs of horses appear to thicken and enlarge to the eighth year, if unrestrained; as do also the other parts of the body furnish to this period. I think I have also distinctly observed a fact in respect to the horse's foot that is worthy of particular notice; that in the autumn of the fifth year of their age, a remarkable cast or exfoliation of the horn of the frog takes place, which is accompanied with a change in its constitution and character; for, after this period, it becomes more contracted in its dimensions, harder, and more sharply pointed, which change considerably adds to the beauty, and no doubt also to the use of this part. The smiths, who miserably slice away the horn which defends this part, do as wisely, as one who should cut away the horn of the balls of a dog's foot before his being taken to the field to hunt. Indeed, the public but little know the extent of injury they are suffering from this cause, obstinately persevered in; and now, not so much from ignorance, as a perverseness, which merits severe reprehension, or rather deserves a public act, to forbid it. Stable servants also have a notion, taught them originally by the smiths, that the horn of this part should be scalped away, and insist on its being "*well cut out*," thus stepping out of their proper province to do mischief; for it is their's to feed and clean the horse and look after the stable, but not to interfere in the smith's department, in a matter of such moment. Masters, again, in fear of these men, are often not really masters of their own stable, and dare not oppose them; and he who offends the man is also almost sure to offend and lose the business of the master, that it is tender interfering, for those who depend on this business for a livelihood, or wish to be honest in telling them their true interests.

From the above, and other experiments which I have made with the natural foot, I should be of opinion, that a considerable number of horses, whose exercise is hardly more than what is necessary to their health, or that of their possessor, especially where the roads are sandy, or the green-sward presents abundantly, might go without being shod, and escape thereby the various complexity of mischief which this art entails. To those who may be desirous of employing the foot in this natural state, I might just say, that there can be nothing more simple and easy to manage; for by wear it is soon rounded at the edges, and forms in front an obtuse



figure, that cannot easily be torn or splintered. And the wearing line assumes an undulating or waving form, which preserves it from fracture; this figure appears to be the result of the two motions or situations of the limb, viz. in meeting the ground, and in leaving it, describing a different position in each, as it is placed before or behind the radius, or rather centre of motion of the lever of the limb.

As to the *paved roads or stones*, as they are often called, in London, I have had much experience in riding unshod horses upon them; and find the natural hoof does not suffer in nearly an equal degree on these as it does on a gravel road, as there is nothing in the smooth surface of a stone to rub or wear away the hoof. Their hardness, however, is a subject of great complaint, and which has been ignorantly imagined to be productive of numerous evils; but more, I am satisfied, is attributed to this kind of road than belongs to it even in this respect, and that the numbness of feet, and blundering manner of going, is not so much the effect of the stones, as of the hardening and contraction of the hoof, about the foot, and the formation of ring bones from the too solid and fixed properties of the shoe; and these evils ought in justice most often to be referred to its defective general principle.

The coating of dirt, which the stones almost unavoidably get, usefully takes from them that hardness and slipperiness they otherwise would have, especially when the dirt is moderately dried; and which I believe should rather be to a certain degree permitted than removed, and especially if the notable invention of iron paving should become more general. The hard, smooth, and well-compacted causeways of the Romans, on which their horses feet rung and resounded,\* were not complained of as being too hard for their horses feet unshod, and their causeways indeed alone would shew us at once that they did not shoe, for it is evident these irons would have had no more hold on such a surface than upon the flag-stones of the foot-ways of our London streets, the danger of which is pretty well understood.

Fresh granite is more destructive of the Hoofs than old stones, and if covered with new gravel, it becomes a very grindstone to the feet, more so even than any gravel road can be. As the roads are at present, it is obvious some defence is necessary for much use of the horse upon them. The most

\* Atque tuis primùm *Sonipes* calcaribus arsit. Claudian. lib. 1.  
Sit tibi præterea *Sonipes* Maurusia tellus, NEMESIANUS, v. 259.



simple defence of the nailed kind that can be used, next to the natural foot, is, *The Tip*, (see plate 2, fig. 6,) which should be made of steel not very thick, and nailed on by three or at most four nails, assisted by two clips in front; it affords protection only to the very front of the hoof, which should be a little hollowed out to receive it. The next shoe in point of simplicity, is, *the Lunette*, or *Crescent*, somewhat more extensive in its protection than the former, covering a larger portion of the front of the hoof; and after this, will be *the half*, and the *three-quarter Shoe*; this last appears to be what Lafosse intended, and imagining it advantageous that the frog should be pressed upon, he made it thin at the heels, three times thinner than at the toe—See his “*Essai sur la Ferrure*, p. 81, *Planche 4*, *Fig. 5*,” and Plate 2, Fig. 5, of this work.

I have known these shoes to have been used with tolerable satisfaction, and the open state of the foot to be preserved by them much better than by the common shoe; but they do not appear so easy to the foot, which is especially sensible in performing long journies. The objection to them is, the very unnatural tread which they give to the foot, by elevating the toe, and lowering the heels, throwing him too strongly upon the frog and inflexions of the hoof, thereby extending the back sinews, creating first fatigue, then pain and inflammation. Next to these partial shoes, is a shoe covering the entire wall; the nature and properties of which I have already endeavoured to illustrate. *The Bar-Shoe*, again, is a farther extension of it over the frog, usefully defending it after it has suffered by being cut or contracted by shoeing; and in old feet is particularly serviceable, making horses go well, and removing the ill consequences of shoeing. We have now noticed all the shoes at present in use that appeared to be worth considering, and they are all, as we have before stated, upon the same principle, being all portions of a circle or ring, more or less extensive, and nailed to the foot.

Being a little out of the common course of shoeing, I had almost forgot to notice *Frost Shoes*; and as roughing the shoes is an easy thing, and may be accomplished in various ways, so much ingenuity is often exhibited in this way. Two or four points of steel screwed into the web of the shoe is a very favourite suggestion of this sort, and is called the *American Ice Shoe*. To do this, the shoe must be removed, and be drilled and tapped in four places with a female screw, which is about ten times the trouble of simply turning down the ends of the shoe, and when done,



answers about half as well. And we find also, that horses so turned up go particularly firm and strong, so much so, that many have been induced to continue this mode of shoeing ever after, and which I attribute to the removal of the frog from too frequent contusion with the ground.

To make more generally known a mode of treatment for *Corns*, as they are called, I have inserted in Plate 2, Fig. 10, a thick broad-webbed shoe with the inner heel entirely cut off, which is a radical cure for corns as long as it is complied with; this method I have practised now more than a dozen years with great success and satisfaction, and the horse appears to go as well, as far as I have seen, as when both the heels are of a length; this I state, to do away prepossessions and fears, which those who never tried it would naturally have, and which I had myself on first using it. But people are apt, as soon as the corns are thus removed, to hasten to shoe again with the long shoe, by the advice of their grooms or the smiths, and so bruise again this tender *inter-tortional* point of the sole, and then say "corns are incurable." For more full information of the nature of these bruises, I may refer the reader to the article *Corns* written by me about ten years ago, in *Rees's Cyclopædia*.\*

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Having considered the different kinds of nailed shoes, and the probable extent of use of the natural foot, I now proceed to describe a new kind of defence on a different principle, which if carried into general use, will remove the use of nails altogether, and bring the practice of the defence of the hoof within the limits of a simple domestic process, in which the rider himself may perform, and not subject himself to the abuses, conceited ignorance, and often impertinence, of those who are at present occupied

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\* That I may omit nothing which tends to illustrate the subject of the Foot and Shoeing, I may here state that my friend J. Turner of Croydon has lately observed a farther mischief, which attends at times contracted feet, and that is, that the tendon of the *perforans muscle*, or back sinew, is found adhering to the under surface of the *Shuttle Bone*. That such a consequence should ensue from the constrained and motionless state into which the foot is reduced by the overpowering iron is not to be wondered at, and it is perhaps an effect of the upward pressure of the sole and posterior parts of the foot against this tendon that occasions their union. But having obtained a considerable number of contracted feet from the slaughter-house; on examining them, I did not find it to have taken place in more than one in sixteen; that some other cause besides contraction appears to be necessary to this effect, perhaps inflammation from strains, or ring bones, or even bad thrushes, may influence its production.

With Street-Nails, or Kennel-Nails, as they are called, the nail passing through the frog and piercing the Tendon, occasions also its inflammation and adhesion; but such cases have nothing to do with shoeing or its effects.



with this art, and are most often above all kind of instruction. Although one should rather desire, if this art should ever be perfected, that artificers making this branch of work their proper employ should be scattered in towns and villages, and who unaffectedly, and according to good sense and sound reason should do their business in this respect, usefully assisting the equestrian in difficult cases, or whenever needful. And I have sometimes thought whether the heavy horned cattle in their long journies from the North to Smithfield, might not be defended also on the same simple principle, so as to save them the dreadful sufferings they often undergo, obliged to march on their naked tender bleeding flesh, from the loss of their hoofs, or from their being worn through; such things are often seen in the roads leading to the Metropolis, so that it is a remarkable fact, that while one poor animal is suffering from being overshod, if I may use the expression, the other suffers almost as much, from not being shod at all.

This invention I have called *The Paratrite*,\* to distinguish it from other modes of defence, as well as to remove the slavish and mysterious notions which attach to the term Shoeing when applied to horses.

Its principle is founded upon the circumstance of the wall of the hoof being of a cylindrical form, as we have before explained, so this defence embracing a part or portion of the exterior of the cylinder is made to pass underneath and by upright teeth passing within it, to embrace the interior also, and by this means is held on. It is a material consideration in the use of this defence, and has been a circumstance before noticed, that the line of wear is worn away three times faster than any other part of the hoof, so this defence defending this portion, enables it to perform three times the work it is capable of in the natural state of the hoof, which is sufficient for many useful purposes; and we may add that two or more of these shields may be applied, and the defence on the same principle carried round the whole, or any part of the hoof.

A figure of this defence is seen at Plate 3, Fig. 1, on the hoof, where the upright part, *a*, which we call *The Helmet*, lies in contact with, and is closely fitting the outer surface of the Wall; and the three claws, *b*, *c*, *d*, Fig. 2, grapple with the interior surface of it, passing deeply into the horn of the sole, or between it and the wall, but short of its thickness, so as not to endanger wounding the foot. It is simply driven on the hoof by

\* From *Para*, *adversus*, or against; and *tero*, *trivi*, *tritum*, to rub or wear.



means of a hammer, or even a stone, if this should be wanting, and is secured by a screw, *k*, passing laterally into the wall of the hoof through the perforation, *e*, of the helmet; or otherwise, by a purchase against the side of the hoof, by a tooth lodging in a notch of the wall, and secured by a web, thong, or strap, passing round the hoof, and, if necessary, over the coronet, and is either simple or padded—see Fig. 4.

In a journey made to Bath a few weeks after the one I have before described, I drove on a pair of these paratrites, and then performed the journey with ease in three days, the whole way to Bath. The weather being fine much favoured the experiment, and I took advantage occasionally of the grass and loose sand which presented by the road side. Other examples I might also state of their use. I once rode from Cherril, a village in Wiltshire, near Calne, to London, a distance of more than eighty-six miles, in two days, without any other defence, and with no defence whatever to the hind feet. The weather was particularly fine, and the roads dry and dusty. I was often surprised, in making these experiments, at the comparatively slight degree of wear, which the heels of the hoof, or rather the posterior angles of inflection, suffered. I once drove a hob-nail, such as ploughmen use in their shoes, by way of assistance to the paratrite, into the angular column of the inflection, near Marlborough, and I was astonished to find that the hammer markings on the head of it were hardly effaced, on my arrival at Hyde Park Corner. This I am induced to mention, as it is contrary to general apprehension in respect to these parts.

This thin casing of steel does not materially disturb the natural bearings of the hoof on the ground; and I have found that one of a very moderate thickness will endure the wear of a hundred miles. There is no objection to leather being interposed between the paratrite and the hoof, especially between the inferior plate or rubber, which is next the ground. I might also hint to those who may manufacture them, that there must be no incongruity or want of harmony in the direction of the teeth. Other constructions of the purchase lever are seen at Fig. 6, 7, and 8, with and without a joint to the hook, and one with an adjusting screw. Another mode of attaching them is seen at Fig. 9, by means of a screw; the two claws, *a*, *b*, driven against a notch in the hoof by the screw, *d*, will force the piece, *e*, against the top of the paratrite, *n*, and so draw it on and fix it to the hoof. Another suggestion for preventing



the return of the paratrite, after it has been driven on, is seen at Fig. 10, where the points, *g, g*, forced against the hoof by the screw nut, *f*, will oppose the descent of it; not having had time to try it, however, I do not vouch for its effect.

Having described the plan, and suggested farther improvements of it, I leave the perfecting it, if found worthy of it, to more ingenious artificers. I may here just state for their help, that in order to make the dies for impressing the steel accurately to fit the hoof, an impression is first taken in sheet lead, and the steel made red hot is reduced to the figure between the dies in a strong vice. As no patent has been taken out by me for this invention, it is open to the attempts of the ingenious.

In thus arming the foot a formidable obstacle presented itself in the obdurate nature of the steel. I record here the machine which after many trials, I found to answer best for this purpose, and which would cut out of a steel plate an entire paratrite with its teeth at one blow; a thing deemed utterly impracticable by an eminent artist in this metal. The machine I used was made of a thick square piece of wrought iron cut entirely through, in notches, in which were lodged chisels of tempered steel; placed upon an anvil, the backs of the chisels rested upon the hard face of the anvil, and the steel plate made red hot and placed upon them, was cut through, by the blow of a heavy hammer, or which was better, a ram-head, descending fifteen or twenty feet, in a groove.

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#### *On removeable Shoes.*

IN making shoes to take on and off, or removeable shoes, as I call them, which would be the perfection of shoeing, there is great difficulty in fastening such securely, on account of the hoof being a cylinder, not a cone, as is generally, indeed universally, apprehended;\* for had it been a cone, the difficulty would have been much less. I shall briefly describe four of these shoes, represented in plate 3, which are put on without nails, and removeable at pleasure. I used many of them on the road with considerable satisfaction; but thought them on the whole too complex to recommend for general use.

\* See Prof. Coleman's Works, p. 42, as indicating the general views of this subject.



Fig. 1, is a shoe of this kind made of steel, intended solely for fixing it to the hoof; beneath it I place a second, for receiving the wear of the roads, which is renewable, the other permanent. The points, *a, a, b, b*, after the shoe has been slid upon the hoof, are driven laterally into it, which prevent its return, and the button or nut *d, d*, serve to fasten down these arms or indexes, which open by a hinge at the other extremity; *g*, is a piece for securing the toe or front of the hoof. The tops of these stays which receive the hoof may be connected together by a band of steel or leather, making them firmly embrace the hoof, and preventing their flying from or relaxing by the pressure of the lateral points. The points may be shifted, if required, there being two or more holes in each tongue, for screwing them into.

Fig. 2, is also a double shoe, and differs from the former by having in front a steel piece moveable on an hinge provided with a slit, in which a steel tooth, *a*, slides up and down, and is fastened at any place by the nut, *k*; this passes into a hole made by a passer at right angles to the slope of the front of the hoof, is adjusted by the groove, and then fastened; a curb chain, *g*, passes round the top of the hoof and secures it. The hooks, *m, m*, serve to keep the chain in its place; at the extremity of this chain is a notched steel pin, which fastens it by a small bolt with any degree of tension: this chain may also be covered with leather.

Fig. 3, is a shoe somewhat similar to the former; the toe is fastened or locked by a diagonal pin, which is then secured by a notch and point, revolving on its axis. A band or web is passed over the heels to assist its firmness; the stays for the points are also different to the former.

Fig. 4, is a shoe, formed of elastic straps of steel, having numerous points which enter laterally into the hoof, on the closing of the straps by the steel band and secured by the rack-clasp. One of the pieces open on an hinge, the better to let in the foot, and carries a flattish stout point, which enters the hoof on its being closed, urged by a hammer or the hand.

These we have often used, and they serve to show that the art of shoeing is not exhausted in the use of nails, as many smiths conceitedly imagine.

Since the disclosure of these facts respecting the feet of horses, many persons touched with compassionate feeling for their sufferings have sent



me their propositions and plans for removing the evil, one of them, that of my friend, Benjamin Rotch, Junr. seems worthy of a more particular notice, and for which he has actually taken out a patent. It consists of a common horse shoe, divided or cut into several pieces, as four, five, or six; these being placed on a piece of stout leather of the figure of an ordinary horse shoe, are riveted to it, thus united they are applied to the foot, and nailed on in the usual way. The defect of this ingenious invention appears to be, that one or two nails, which these pieces only admit of, are insufficient when partial pressure, from irregularities in the road, such as loose stones, &c. come in contact with them, to retain them firmly in their situation, the whole weight of the horse then falling upon an individual piece, loosens it, by drawing the clenches, or breaking the nails.

A Nobleman of elevated rank, and eminent for his knowledge of these delightful animals, has condescended to consider these difficulties of the feet, and has honoured me sometimes with his communications in this respect; more than three years before Benjamin Rotch's Patent was taken out, he ingeniously suggested a shoe made of pieces, pretty much in the same way, but proposed their being combined again, not by a Sub-shoe of leather, but of some tough, elastic wood, which would be found I believe preferable to the former, as it would give a more firm support to the individual pieces, and would not be so subject to be relaxed and rendered soft by wet.\*

Various other plans I also received; but from their obviously impracticable nature, forbear to notice them. On plain, smooth roads, such shoes as the above, might I apprehend be used; and also for standing in stables, for Riding-Houses, parks, pleasure grounds, and fields; but a shoe more firm will be necessary for rough and stony roads. The public long used to shoes of immense strength, disregard all partial helps, though in many cases they might be useful, and are ever considering an extreme case of labour, and the worst of roads, as though all horses were used for stage-work, or all the roads of the worst kind, therefore nothing short of a shoe obviating such difficulties will probably meet with general favour; and such a one I have now with infinite satisfaction to propose, which is strong enough for every sort of road, and will afford the full advantage of all the labour the horse can render, whilst it admits the movements natural to the foot; at the same time is as simple and easy of application as another shoe. I am

\* Perhaps the *Wild climber* or *Honesty*, (*Clematis vitalba*,) would afford this sort of tough elastic medium, and there are also many exotics of the same family for examination.



the more pleased with it, as great doubts were entertained by me for a long time of the possibility of such a defence in a manner suitable for public use, as may be seen in perusing the second part of this work, page 95, so am I gratefully thankful to be able, almost unexpectedly, to conclude my labours in so satisfactory a way. For the discovery of the cause of the evil was made matter of reproach to me, since there appeared no remedy; and it is indeed singular, considering how much reflection had been turned upon this subject, that no one should have suggested it before, as it is now nine years since the first part was published. The manner of my being led to it, I shall here simply relate.

When the injurious effect of the common shoe first became understood by me, the immediate suggestion that occurred for relief was a jointed shoe; but as the joint would necessarily fall in the front of the shoe and come within the wearing line, so it would be soon worn through; or if only half through, or the head of the rivet was gone, the two pieces would come asunder, or no longer support each other; for it is clear a shoe of two pieces, meeting in the middle of the toe without any joint or connection, would be liable to be torn off in rough roads, and the side of the hoof torn away with them; I therefore laid aside this sort of shoe as impracticable, and began to attempt the difficulty by removeable shoes, till wearied with unsatisfactory efforts, at least for general purposes, I fell afterwards upon the more simple principle of the Paratrite, hoping to secure by this means one class of horses, from these mischiefs, whose utmost labour was not required. I was about to conclude this work, in fairly stating the difficulties of the subject, when the remedy was unexpectedly supplied, in the following way: my esteemed, and ingenious young friend, Thomas Hodgkin, then living at Tottenham, brought me a shoe of his contrivance formed of two halves, which hooked by dovetail into each other in front; I shewed him the objection they were subject to, of being quickly worn through, and soon becoming unserviceable. This object, however, lay before me for some days, and it was in viewing it that it occurred, that this difficulty of the hinge might most easily be removed, and this by the simple application of a steel pin for the iron one to rivet them together with; and farther, that if the head of the rivet was made large and hardened, it would serve at the same time to defend the joint and steel the shoe. So that by this unexpected incident my views were recalled to this first object. I shortly after had one made, and the experiment answered my utmost expectations: in respect to flatness and smoothness, they can be made, if required, as smooth as the common shoe;



and as to the mode of fastening, it is in all respects the same, viz. with nails, that it is as firmly attached as they can be.

The shoe itself I do not claim as any novelty; for it is often seen hanging as a curiosity against the walls of forges, and has been called by some the hunting shoe, being, as it was said, sometimes taken into the field by the huntsman, and if any shoe came off during the sport and was lost, this supplied its place;—possessing the power of dilating and contracting, it fitted all, if a village smith could but be found to nail it on. It is not therefore the shoe itself, but the new principle for its application, that I claim, and the discovery of the real structure and habits of the hoof, which indicate its necessity, as also the rendering it practicably useful by the substitution of the steel-headed rivet for a common iron pin, without which it would be scarcely of any real value.

It will now be necessary to advance some proofs that this shoe does not contract the foot, which I believe can be established satisfactorily. An experiment was carefully made on my young bay stallion, got by Waxy out a celebrated Hungarian mare, and bred by the late Lord Heathfield; he is now nearly six years old, and has been shod with these shoes more than a twelvemonth, without the least contraction of the hoof whatever, which continues as round as an apple, and his going is bold, extensive, and firm; his frogs, which never instrument touched, are a model of this organ, and demonstrate most clearly the perfect absurdity and folly of slicing away on any pretence the horn of this part.

The same experiment has been made by my friend, John Hall, Esq. of Pinney Cliffs, Devonshire, with the same satisfactory results, but with him the horse had previously been shod, and contraction of the foot had commenced, which it completely remedied, and restored his action; some others also of my friends have found them equally beneficial.—For the appearance of this shoe, see Plate 2. Fig. 10.

We may see the movement of the shoe, by taking up the foot between the hands and squeezing it; on relaxing the pressure, the shoe and foot may be seen to fly open again.

To witness the effects of a common shoe, one was put on for six weeks, and an impressed ring took place round the coronet, or rather upper part of the hoof, as described before at page 93 of the Second Part, which shows this to be a delicate and useful test on a new foot.

Perhaps a farther improvement on it would be, to make the hinge, not in the middle, but on one side, and instead of making the toe perfectly round, to



give it an obtuse figure in front, see Fig. 12, which is more consistent with the form of the natural foot unshod; two advantages attend it, by the toe being shortened, the danger of tripping and stumbling is lessened, and there is less distress or strain on the back sinews. Opportunity also is conveniently afforded by this figure for the insertion of a piece of steel rivetted through, by the ends of the steel being bent up, as seen at Fig. 13.

In regard to the expence of such shoes, if a little more expense did attend them, to preserve a noble and costly animal from suffering, a few shillings a year would be of no real moment, but my belief is, that most fortunately, they can be made as cheap, if not cheaper, than the common shoe, for the following reasons: that iron being a very stubborn metal, to cut out an entire shoe of any size by an engine, has been found not commercially practicable, the dies breaking too frequently from such straining efforts: but the half of a shoe most happily for this system can be stamp'd out at a blow, without risk, and then the expence is not great. Such shoes, accurately made, have been already sent me from an iron works, near Stourbridge in Worcestershire, at a moderate price, that I apprehend the expence will not be felt, and they may become a useful object for some of our manufacturing towns; and as no patent has been taken out for them, they are open to improvement.

I now conclude my treatise on the foot, which imperfect as it is, has been the result of much research and labor, having nature ever before me for my guide and not books, that I trust it will form a more solid basis for the repose of the art, than has hitherto been known. Of my predecessors I have rather screened their mistakes than called them into notice, and hope to experience of others the same charity.

The French have deemed it worthy translation, and in that work a new arrangement of the matter is seen, which it is my intention to adopt in a second edition which appears likely soon to be required, with other additional matter that has occurred since. For many facts were discovered in the course of printing, and were introduced rather than omit them, out of their places; the whole anatomy of the hoof is of this description, as I had in view in the commencement only to report the experiment of the effects of iron on horses feet.

The past sufferings of these animals we may regret, but cannot now recall, let us in future be more on our guard, for this noble gift of providence is not bestowed without conditions, if the earth we cultivate requires previous consideration to obtain its fullest rewards how much more to obtain his services agreeably and lastingly does a living animal so exquisitely wrought,





