

sinuses, which become very difficult and tedious to heal. It is such a suppurating fistulous sore which deserves the name of poll-evil.

FISTULOUS WITHERS.

This is also a suppurating fistulous sore at the top of the withers very frequently involving the top of the superior spines of the vertebræ.

Causes.—Injuries from badly fitting riding saddles, or cart saddles pressing on the withers when the animal is holding back a heavy load going down a hill, when there is a great weight on the back.

Symptoms.—In some cases of severe injury, an open sore is formed in the first instance, making a little pocket, the bottom of the pocket being towards the neck; if this is neglected matter lodges in the sore, and gradually burrows downwards. Most frequently, however, a diffuse painful swelling follows the injury, an abscess forms, which, if properly treated, will ripen and discharge its contents, and if the bones are not injured, may heal up again without much trouble if kept properly cleaned and dry. When the bones are injured, or the ligaments and covering of the top of the spines are destroyed and slough off, leaving the top of the spines bare, or when matter burrows down on either side of the withers forming pipes or sinuses, the case becomes very troublesome to heal.

Treatment.—The principles of treatment for poll-evil and fistulous withers are the same. If there is an open sore to start with, the wound requires to be carefully cleaned, and dressed with an antiseptic dressing. But the secret of success consists in keeping the wound dry, *do not allow any matter to lodge in it.* All that is required is a small piece of sponge soaked in a little antiseptic lotion, then wrung out, and applied to the wound to absorb all the moisture which collects in it. If the wound is cleaned and dried in this manner, six or eight times a day, and a little iodoform dusted over it, each time that it is dried out, healthy granulations will gradually form over, and the wound will heal up readily, without any burrowing of matter.

In cases where the bruised part swells up and matter forms, the abscess must be assisted to "ripen" as far as possible, and a very good application for this is a paste made of white of egg and flour. Whisk the white of eggs—using as many as required—and flour together, into a paste, lay this thickly on to a piece of linen or calico sufficiently large to cover the whole swelling, and fix it on to the swelling, it will stick like a plaster and will only come off when the abscess is "ripe," when it generally brings the sloughed portion of skin with it, allowing the matter to escape freely. Hot fomentations or hot poultices act equally well, or better, if applied continuously, but I know the difficulty of getting such directions carried out in this Colony. If the abscess opens at the lowest part and there is no appearance of pipes or sinuses, clean and dress the wound in the ordinary way, but if the opening is *not* at the bottom of the abscess, it is

absolutely necessary to make a free opening at the bottom to allow the matter to drain out. If the sinus burrows deep down the side of the withers within some of the muscles, a good plan is to take a large seton needle, and put a piece of tape through the eye, insert it down to the bottom of the sinus and bring it forcibly out through the skin in a sloping direction. Leave the tape in, tie a large knot on each end to keep it from being pulled out, and move it up and down several times a day to keep the drainage hole open. If the sinuses are near to the surface, slit them open with a knife to the bottom, and dress as recommended for open sore. Very often when the wound has almost healed, a fistulous tube or pipe will appear, which, on examination, may be found to penetrate down from four to eight inches. These are very trying. For these inject the following caustic tincture by means of a glass syringe:—

Perchloride of mercury	30 grains.
Spirits of wine	1 ounce.
Hydrochloric acid	10 drops.

Mix and inject this into the sinus once a day until the discharge ceases; apply pressure to the parts by means of bandages or other contrivance to bring the edges of the sinus together. *This caustic should not be used in poll-evil, as there is a danger of the slough penetrating the spinal canal there.*

The principal considerations, then, in the treatment of poll-evil and fistulous withers, are, to open the sinuses freely to the bottom with a probe-pointed knife, and keep the wounds thoroughly clean and dry by frequent careful dressings.

ERYSIPELAS.

This is diffuse inflammation of the skin, and generally of the subcutaneous tissues, having a tendency to spread freely and in many cases to become contagious; it is preceded and accompanied by a febrile disturbance. Although occurring most frequently in connection with a wound, it may arise occasionally on an apparently uninjured surface. Erysipelas varies in severity from a simple skin redness, with little general disturbance, to a severe destructive inflammation, with dangerous constitutional symptoms. It is generally considered to be a specific inflammation of the skin.

It occurs most frequently in horses from wounds about the legs, and is due to infection with micro-organisms; in most cases, if not in all, to the variety of organism known as a Streptococcus.

Symptoms.—"In an indefinite period, but generally about the third or fourth day after the infliction of an injury, the skin in the immediate neighbourhood of the wound is found swollen, hot, tender, and painful; the swelling gradually extends from the wound, embracing in some instances the whole superficies of a limb in the course of a few hours. The swollen surface pits on pressure where much areolar tissue is found, &c." (Williams.) "I have not seen it in the legs of horses in this Colony, but it may occur about the head, chest and belly" (Law). It may arise from a trivial wound,

which is apparently healing satisfactorily; the limb may be all right at night, and next morning a diffuse swelling may have extended from the coronet to the knee. In one case which arose from a wound on the upper part of the fore-arm, the whole limb was swollen within twelve hours, although the wound was inflicted a fortnight before. Vesicles or blisters are described as sometimes occurring on the surface of the swelling but I have not seen them. After a few days the swelling begins to subside, with desquamation of the cuticle, or cracks may form with a sluggish, unhealthy action and little tendency to heal.

In some cases where the deeper structures become involved in the inflammatory action, matter may form, and considerable destruction of tissue take place, with severe constitutional disturbance, &c., but such cases are rare in this Colony.

Treatment.—Give a dose of purgative medicine, a pint of raw linseed oil, or four drachms of aloes; bathe the part with warm water, containing some antiseptic, such as cyllin or Jeyes' fluid, afterwards moistening the affected surface with a solution of borax in water (1 in 30) and laudanum, or a mixture of liquor plumbi and olive oil (one of the former to four of the latter), and cover up the swollen part, if a leg, with flannel bandages put on loosely.

Give good, nourishing food, and two drachms of the tincture of the perchloride of iron twice a day.

Any abscesses which may form will require opening with a lancet to allow the discharge of pus ("matter"), the wound or wounds must be disinfected afterwards with carbolic acid lotion (one part carbolic acid in twenty parts water).

DISEASES OF THE BONES.

OSTEO POROSIS, SPONGY BONE, OR BIG HEAD.

This is a peculiar disease of the bones of horses, in which they gradually become spongy in texture. One authority says "it is due to the absorption of the walls of the medullary spaces and secondary areolæ of developing bone;" another that "it consists of the excessive development of the tissues which occupy the canals and cells of the bones, whilst at the same time the actual quantity of bony matter remains unaltered." In quoting the latter opinion Professor Williams says, "the growth of the contents of the canals and cells must naturally cause a rarefaction of their walls and the bone becomes increased in volume, expanded, as the walls of the expanding cavities become thinner and thinner, till at length apertures are formed, and cavities which communicate one with the other, containing a dark red medulla, traversed by dilated vessels, and which sometimes become ruptured, and the cavities become filled by loose or firm clots of blood."

The cause and pathology of the disease are not thoroughly understood. Some authorities attribute the cause to a deficiency of lime salts and phosphates in the oathay which is

grown in some of the Colonial districts, but diet would not appear to have much influence either on the origin or development of osteo-porosis, as the disease is equally likely to occur in the most completely appointed stables where the food, care and management are of the best, as it is in the half-starved and hard-worked animals which are kept in the most insanitary of surroundings.

The whole of the evidence connected with the several outbreaks of osteo-porosis, the history of which is known, points to some definite originating cause. Although up to the present no specific micro-organism has been discovered in the bodies of affected animals, and inoculation and feeding experiments have failed, the fact remains that once the disease has appeared in a stable, it will continue to manifest itself with more or less frequency in that stable or locality for an indefinite period, unless some radical measures are taken to arrest it. Numerous observers have noticed that "if a fresh horse be put in a stall which has just been vacated by one which suffered from osteo-prorosis, the newcomer usually contracts the disease within a limited period."

It is wise to take these facts into consideration when dealing with the disease, and it is a sound precaution to thoroughly disinfect premises which may have been occupied by an animal suffering from osteo-porosis before allowing the place to be again used for stabling other horses.

Symptoms.—These are not very distinct or uniform, the animal does not appear so lively as usual, and does not feed well; he is then reported as going stiff or lame in his gallops, first in one leg and then in another. In some cases the movements seem to indicate disease or injury about the loins; there is an inability to flex or extend the hind quarters properly. An examination does not show anything very definite to account for the lameness, except tenderness on manipulating the affected limbs. This may go on for weeks, but by and by the head begins to enlarge, especially about the lower part of the face and nasal bones, which become rounder and fuller looking than natural, and manifest tenderness when tapped with the knuckles. The appetite now begins to fall off, there is a disinclination to eat hard food, and when the bones swell very much the nasal passages become contracted, and the animal may experience considerable difficulty in breathing.

Treatment.—The treatment which has proved most successful has been to send the horse to a farm, or to another stable some distance away, and feed him on green succulent food, more especially carrots. Several have recovered under such treatment leaving very little trace of either swelling or lameness, but none have returned to hard work. The majority have been destroyed as soon as their heads began to swell, not being considered worth keeping. Until something more definite is known with regard to the nature and cause of this disease, it is difficult to give any satisfactory advice respecting either its prevention or cure.

RICKETS.

Rachitis or Rickets—a disease of young growing animals—is characterised by a softened and distorted condition of the bones. Young pigs and dogs are mainly affected, but the disease may occur in other young growing animals including foals, although it is somewhat uncommon in the last mentioned species.

Rickets consists essentially in the bones of the young animal remaining soft in consequence of deficient calcification, whilst osteoporosis, on the other hand, is a rarefying process of formed bone in which the earthy salts are absorbed.

Cause.—A deficiency of lime in the food is regarded as the principal cause of rickets. Confinement in dark insanitary stables and buildings and want of exercise are liable to act as predisposing causes, interfering with the health and tone of the young animals.

Symptoms.—Unthriftiness. Stunted growth. The ends of the bones become enlarged—this is frequently most noticeable in the ribs and the limb bones. In some cases the softened bones bend under the body weight—the legs become distorted, bent outwards or inwards, this, however, is more commonly seen in rickety puppies and pigs. The sternum (breast bone) may likewise be distorted, and the back may be arched, upwards, downwards or to one side. The joints of the limbs are usually swollen—that of the knee, hock and stifle more especially. Pain and lameness may be manifested. Fracture of the bones occasionally happens.

Treatment.—Change the diet, giving a ration rich in nutritive matter and earthy salts. Sterilized bone meal may be mixed with the food—a teaspoonful to a tablespoonful according to the size of the animal. Common salt also acts beneficially, and antacids, especially lime water are likely to produce a good effect. A change of pasture should be given whenever possible.

In sucking foals the dam may need attention—a change of diet will be required, together with daily doses of bone meal and salt.

Prevention.—Attend to hygiene. Allow exercise and plenty of air and sunlight. Avoid the use of dark insanitary stables and buildings. Endeavour to improve the conditions of breeding generally. The use of foodstuffs deficient in earthy salts for mares with foals or young growing animals should be avoided. Maize (mealies) being deficient in saline matter should not enter largely into the diet of such animals, unless supplemented by some other article of food making good this deficiency. The same remarks apply to forage grown on land deficient in lime and phosphates.

FRACTURES.

A fracture is a solution of continuity of one or more bones. It is termed *transverse*, *longitudinal* or *oblique*, according to its direction, in regard to the axis of the bone. Fractures are termed *simple* when the bone only is divided, without an external wound; *compound*, when the tissues are lacerated, with a wound through the skin; *comminuted* when the bone is broken into several pieces; *complicated*, when, in addition to the fracture, there is some serious

injury to the adjoining parts, as when a fractured rib penetrates the lung; *compound comminuted*, when there is an external wound, and the bone is broken into several pieces. There are other distinguishing terms used, such as *complete*, when the whole bone is broken, *incomplete*, when the bone is only partially fractured.

CAUSES OF FRACTURE.

These may be either *predisposing* or *exciting*. Amongst predisposing causes may be classed certain diseases of the bones, such as osteo-porosis, osteo-malacia, or a brittle condition of bones frequently met with in old horses; hence, there is always a greater risk of a broken back when casting an old horse.

The exciting causes are external injury from falls, blows, violent muscular contraction, and concussion.

General symptoms of Fracture.—Severe and sudden lameness, and an utter inability to bear weight on the limb; a striking deformity of the limb, with shortening, if it is in the shoulder or upper thigh bones, with trembling of the muscles at the seat of injury; an unnatural freedom of movement of the part, with a grating or crepitating sensation conveyed to the hand when the broken bone is moved; there is also considerable swelling generally when the surrounding tissues are lacerated or a blood-vessel is ruptured. There may, however, be partial or even complete fracture without displacement, as frequently occurs in the tibia or lower thigh bone; this bone is firmly surrounded by a strong fibrous membrane which often holds the fractured ends in position for a considerable time after the fracture has occurred, the severe lameness being the only indication that a fracture exists, hence, as Professor Williams pertinently remarks:—"All cases of punctured wounds of this part, from violent kicks, &c., should be treated as if the bone were fractured, until the lameness disappears." I remember one such case of fracture of this bone, in which displacement only occurred during the painful struggles which the animal made when the limb was being examined in order to detect the seat of the lameness, which was suspected to be in the foot.

Treatment.—This consists in bringing the broken ends of the bone into exact apposition, and retaining them there by means of splints and bandages, and this should be done as early as possible after the fracture has occurred, in order to avoid any further irritation to the adjoining parts, and to get the fracture reduced before the parts have become swollen and stiff.

When a fracture with displacement occurs in the muscular part of a limb above the knee and hock, it may be necessary to cast the animal on the sound side to get the broken bone set properly, and employ extension and counter extension, that is, the upper portion of the limb is drawn up and held firm to the body, while the foot, or portion of the limb below the fracture, is pulled out with sufficient force to enable the operator to bring the broken ends of the bone into exact apposition, and to keep them there while the splints and bandages are applied.

Splints may be extemporised from a variety of materials, the choice being often a matter of necessity rather than preference. Gutta-percha, or thick sole leather, softened in hot water and moulded to the form of the limb, is generally preferred; strong paste-board treated in the same manner answers very well. For small animals, the starched bandage or plaster of Paris bandage, is very suitable. There are many specially prepared splints and supports for the limb used by professional men, but it is not for the instruction of such that I write. Suitable splints may be made out of any green tough wood, or even from the thick bark of some trees, an appliance which I have used several times in this Colony. The object aimed at is to fix the limb so that all movement at the seat of fracture is prevented, and to do that without injuring any other part of the limb, or interfering with free circulation of the blood within it.

Each particular fracture will, of course, require a certain amount of special consideration, but the following general directions are applicable to all simple fractures of the lower portions of the limbs. Get from four to eight yards of strong calico, depending on the size of the animal; tear it into strips its full length and about three inches broad, and roll each strip up evenly and neatly as a roller bandage; then make about a pound of good strong starch or flour paste, but before applying the starch, incase the leg from the foot upwards with a layer of dry bandage to protect the skin from chafing. Commence the application of the starch to the second and every succeeding layer of bandage. Several layers of bandage are required, and the paste or starch should be freely applied to each layer after the first. The limb requires to be kept in its proper position until the starch dries, when the latter will form a perfectly-fitting unyielding case.

Plaster of Paris is applied very much in the same manner. Prof. Law recommends "that the powder be thickly dusted into the folds of the bandage as it is rolled up, then soaked in water before it is applied," while Prof. Williams recommends "that the powder be mixed with cold water to a consistence a little thicker than cream, the strips of calico to be soaked in it, rolled up quickly and bound round the leg." This requires to be very hurriedly done or else the plaster of Paris will set in the dish. I generally make a little at one time, and apply it, like the starch, to each layer of the bandage after it is put round the leg. It is important to note that the bandages must in every instance, no matter in what part of the limb the fracture be situated, extend from the foot, so as to embrace the whole of the soft parts; if this be not done, the part immediately below the bandage will swell, inflame, and perhaps slough off from stoppage of the circulation. Further, the bandage and plints should not only embrace and fix all the joints *below* the fracture, but also the joint above the fracture, if possible, in order to secure perfect rest to the broken ends of the bone. Unless complete immobility of the fractured ends can be secured, a false joint is apt to form, from incomplete ossification of the uniting material.

Nature is, however, great in the adaptability of her resources, and succeeds in effecting the complete union of the fractured ends if a bone, in situations, and under circumstances where it is impossible to retain the fractured ends immovable, or even in apposition, and this she does by forming a band of bony matter round the outside of the fractured ends of the bones, which bind them together until union has taken place between them. In such cases, however, there is very often shortening and distortion of the limb, with considerable enlargement round the seat of fracture, which would render the animal worthless, except for breeding purposes.

This is the primary consideration in deciding whether a fractured limb in the horse should, or should not, be set. Is the animal worth the expense, more especially if there is a doubt about the complete success of the operation? The bones of horses unite together as readily as do those of any other animal, but a longer rest is required, before the horse can be safely put to work again. Further, there is little use in attempting to set the broken limb of a horse, unless he can be placed in slings.

LAMENESS.

The term *lameness* has received various definitions. Professor Liautard defines it "as any irregularity or derangement of the function of locomotion." Professor Williams' definition is "a manifestation by one or more of the limbs of pain, weakness, inability or impediment," while Percival adds the words, "in the act of progression." Like most definitions, there may be something relating to the subject which they do not fully express, but these are complete enough for all practical purposes.

Pain, is a common cause of lameness, hence an animal endeavours to move the affected limb or limbs in the way that tends to give the least pain or uneasiness. In like manner, when an animal is in a state of repose, it will rest the affected limb or limbs in that position which is the most favourable to ease and comfort. For these reasons, therefore, when examining a horse in order to ascertain if he be lame, and to determine the seat of such lameness, it is of considerable advantage to examine him both at rest and in motion. Watch the horse while he stands quietly in the stable, should he point one fore-foot, make a note of the fact as this is suspicious of navicular disease in the absence of any other visible cause. Does he uneasily move forward first one fore foot, and then the other, the action indicates tenderness in both fore feet, whatever the cause may be. If he stands with the toe of a fore foot barely touching the ground, whilst the limb is supported by the muscles of the shoulder, this is indicative of acute pain in the sole or heel; whilst to stand with both fore feet extended, resting the weight on his heels, with the hind feet brought forward under his belly, is a characteristic symptom of laminitis or inflammation of the laminae of both fore feet. If the pain is in the elbow joint, the knee will be bent, the toe resting on the ground, the elbow joint being relaxed. Similar symptoms will present themselves in shoulder lameness, but in this case the lame leg is generally

placed a little behind the sound one, "pointing back," as it is termed. Passing now to the hind limbs, if one hind quarter be raised a little higher than the other, with the leg drawn up, and the toe only touching the ground, it is diagnostic of disease about the hip joint, but if the hind quarter is lowered, and the stifle joint flexed in a relaxed position, the indications point to that joint as the seat of the trouble. If a hind leg is placed slightly in front of the other, the toe resting on the ground, with the fetlock and hock joints flexed and the quarter lowered, the position is suspicious of pain in the hock, but a similar position may be assumed when the pain is about the fetlock.

Having carefully noted every peculiarity about the horse's position and movements in the stable, have him led out and trotted on a level hard road, if possible, and be particular to watch his first movements, as the indications of certain lameness are apt to pass off with exercise in the early stages of diseased action. For this reason it is better to have him trotted out at once, as soon as he comes out of the stable, as that is the best pace for showing any defect in action. The groom should give the horse about two feet of the rein or halter-rope, so that the horse's head may be free, as the movements of the head are of considerable assistance in detecting the lame limb, if a fore one. A slow, steady trot is the pace which he should be made to go—straight from, and to, the examiner.

When the horse is trotted out in this manner, the first point to decide is, which leg is he lame in? And it will assist the inexperienced horseman—for it is only for his benefit that I write—considerably, in arriving at that decision, to note that a horse treads lighter on a lame leg than he does on the sound one. If a horse is lame in one fore limb, therefore, he will raise his head and elevate the fore quarter, when the foot of that limb comes to the ground; whereas, he will drop his head, and bring down the whole weight of the fore quarter, when the foot of the sound limb comes to the ground. Therefore, in lameness in one fore limb, remember that the head always drops with the sound one. A similar action is observable in the hind limbs, only the head does not perceptibly take part in it; the hind quarter of the lame limb is raised when the foot comes to the ground, and, correspondingly, the hind quarter of the sound limb drops as soon as the foot of that limb is firmly planted on the ground.

If a horse is lame in both fore limbs, he trots with a short and tender step, holding his head up, his shoulders stiff, and with a peculiar rolling motion of the body. Lameness in both hind limbs is also marked by a short, pottering step, and he generally treads more or less on his toes.

When the lameness is not very distinct, and passes off before there is time to arrive at a decision, as may happen in some cases of incipient navicular disease or spavin, a good plan is to have the horse taken out for a good ride or drive, which will heat him well; on his return allow him to stand perfectly quiet for an hour until he is cool, when, if there be any lameness present, it will most likely manifest itself.

After having examined the position and movements of the horse when at rest and in motion, next, by careful manipulation, endeavour to distinguish the exact seat of the disease or injury, and its character and extent. In doing so, if the lameness is in a fore limb, get an assistant to hold up the opposite fore-leg; and if it is in a hind limb, the fore-leg of the same side should be held up. When bearing the weight of the body in this manner on the lame leg, the patient will, as a rule, indicate at once the seat of lameness when it is pressed upon.

PARTICULAR LAMENESSES.

SHOULDER LAMENESS.

This is a comparatively rare form of lameness, although by the inexperienced, many cases of foot lameness are erroneously attributed to disease of the shoulder joint.

Symptoms.—The leg is brought forward with a circular movement, with the toe dragging on the ground. The pain is manifested more in the movement of the limb, than in bearing the weight when the foot comes to the ground. If the pain is in the joint itself, a good test is to seize the foot, extend the limb straight out, and then raise it up; this brings the head of the humerus forcibly against the articular surface of the scapula, and if the parts are inflamed the pain will make the horse rise completely off the ground. If the inflammation is in the large round tendinous muscle which passes over the front of the shoulder joint, there may be slight swelling, which will be detected by carefully comparing it with the corresponding region on the other side of the body. The part will be tender, moreover the limb, when standing at rest, will be bent at the knee, the toe resting on the ground and pointing slightly back behind the other leg. Take up the leg, bend the knee and move the limb forcibly backward and forward, when acute pain will be evinced.

Treatment.—If recent, reduce the inflammation and tenderness by hot fomentations,—fasten several folds of a blanket around the shoulder, and apply hot water frequently. If the lameness persists, apply a smart blister over the point of the shoulder, and repeat if necessary. In neglected cases, or those of long standing, ulceration of the joint, or ossification of the tendon is liable to follow.

SHOULDER SLIP.

This condition is considered by some to be a sprain of the muscles situated on the outside of the shoulder joint, and which pass down each side of the spine or ridge of the shoulder blade over the joint. "Shoulder slip" is now, however, generally understood to arise from paralysis of the nerve, which supplies these muscles.

"Shoulder slip" is most commonly seen in farm horses used in the plough; it is very rare in this Colony.

It is called shoulder slip, because the head of the humerus rolls or bulges out when the weight comes on the limb. This is due to the fact that these muscles which brace up the joint and hold the articulation in its proper position, lose their contractile power, and very soon become atrophied or wasted. It is surprising how rapidly these muscles waste away in this condition, leaving the shoulder blade with little but the skin covering it.

Treatment.—If there is heat, pain and swelling of the parts, apply fomentations and give absolute rest, but as soon as the tenderness is removed, apply friction to the muscles with coarse cloths, rub in a little embrocation also, and give the horse walking exercise on level ground. Many recommend swimming the horse, and this may be tried where the means of doing so exist.

LUMP OR ABSCESS ON THE SHOULDER.

A large lump will often be seen about the point of the shoulder, quite hard, and showing no tendency to ripen or come to a head, no matter how much it be poulticed or blistered. I saw a tumour once, which was about the size of a man's hand, and, although it was constantly blistered and poulticed, it remained hard, with no tendency to point, for about nine months, when it was opened by a deep cut, the imprisoned matter escaped, the wound healed, and the lump disappeared. These shoulder abscesses generally follow a bruise, or wrench with the collar.

Treatment.—First foment; allay inflammation, and then blister. If the lump persists, and, as is frequently the case, it contains pus, it will be necessary to make an opening towards its centre in order to allow the imprisoned matter (pus) to escape, afterwards treating the wound with ordinary cleanliness and the application of some antiseptic dressing, such as the carbolic lotion. These shoulder abscesses form, not infrequently, quite close to large blood vessels, consequently the knife must be used with caution,—in fact it is questionable whether the operation should be attempted by an inexperienced person.

RHEUMATISM OF THE MUSCLES OF THE SHOULDER. "SHOULDER TIED."

Symptoms.—The muscles of the fore quarters, especially behind the shoulders, are tender to the touch, and the animal moves stiffly, as if his shoulders were fixed. There is no swelling, in fact there is an absence of any other visible cause of lameness.

Treatment.—Hot fomentations, a dose of laxative medicine, followed by one ounce doses of bicarbonate of potash daily in a bran mash. Rub in a little embrocation over the muscles with smart friction. Avoid washing such a horse with cold water.

ELBOW JOINT LAMENESS.

Symptoms.—In severe injury or disease of the elbow joint, the knee is bent, the toe resting on the ground; the elbow-joint is held in a relaxed position, and the animal is unable to stand firm on the limb. In walking or trotting, the lameness and dropping of the head is very pronounced. Forcible movement of the joint will cause acute pain.

SPRAIN OF THE MUSCLES ATTACHED TO THE ELBOW.

Severe sprain of the thick bundle of muscles situated behind the shoulder, and which become attached to the point of the elbow, may occur from slipping, &c. In some instances their tendinous attachments to the point of the elbow may be torn, or the point of the elbow may be broken or torn off. In such cases, there will be acute pain, and considerable swelling. If the swelling is so tense that you cannot detect the loose piece of bone, and yet the lameness is so great that you suspect a fracture, the following directions are given to aid your decision, "bend back the knee forcibly, and let an assistant raise the opposite foot. If the bone is broken the animal will drop, if the muscles only are injured, he may stand."

Treatment.—If the muscles only are injured, give absolute rest, hot fomentations, followed by friction and embrocation. If the bone is broken, this being a very serious matter, put the horse in slings, place a soft pad inside the point of the elbow, and fix the whole limb in bandages, commencing at the foot and continuing right up to the elbow. Splints may be adjusted over all. But unless the animal is of value for breeding purposes, it is rarely fit for hard work afterwards. A long rest will be necessary.

In severe injury to the point of the elbow, causing inflammation of the bone, the head of the bone may enlarge to such an extent that it cannot enter between the condyles of the humerus, and in consequence the animal is unable to straighten the limb; such a horse is comparatively useless.

CAPPED ELBOW OR A "ZWAM."

Causes.—A bruise by the heel of the shoe or a rough, hard stony floor and deficient bedding.

Symptoms.—A diffused swelling first appears, which is tense, hot and painful, by-and-bye it becomes soft, containing serum. If this is not allowed to escape by lancing, it may become partially absorbed, leaving a small, firm tumour. If the injury is repeated, a tumour of considerable size may form. It is unsightly, but only causes lameness during the acute stage, immediately after the bruise is inflicted.

Treatment.—In the first stages apply hot fomentations, and as soon as the swelling becomes soft and serum forms in it, lance it freely at the lowest part, and press the fluid out. Keep the wound open, and encourage it to discharge by inserting a piece of flannel soaked in equal parts of turpentine and oil. If the walls become thickened apply the following liniment:—

Linseed oil	$\frac{1}{2}$ ounce.
Oil of turpentine	$\frac{1}{2}$ ounce.
Crude carbolic acid	8 ounces.

Mix and rub in daily until a very thick crust or scab forms. After that comes off clean, re-apply the dressing as before, if necessary.

If a large hard mass forms, it is better to dissect it out, and stitch up the wound, leaving a small opening at the lowest part

for the discharge to escape. Keep the horse tied up until the wound has healed.

SPRAINS AND INJURIES ABOUT THE KNEE JOINT.

SPRAIN OF THE RADIAL LIGAMENT.

This is a fibrous band situated immediately at the back of the fore leg, a little above the knee joint. When sprained there is pain and a little swelling at the part, accompanied by a difficulty in bending or flexing the knee.

SPRAIN OF THE SHEATHS OF THE BACK TENDONS.

Occurs where the tendons pass down a little above and behind the knee joint,—just where the radial ligament is attached. The swelling which arises from this condition, especially when chronic, is called thoroughpin of the knee, as pressure on one part of it not infrequently causes bulging at the other.

Treatment.—Give rest; if pain and heat are present apply bandages wrung out of boiling water, with firm, even pressure, followed by a blister if the swelling does not subside.

SWELLINGS IN FRONT OF THE KNEE JOINT.

These may be divided into (a) a serous diffused swelling under the skin, resulting from bruising or direct injury, (b) distension of the sheaths of one or more of the tendons which pass down over the knee in front and on each side of the joint; and (c) disease of the knee joint itself and distension of its capsule.

The most common of these in the horse is distension of the sheath of the large tendon which passes down in front of the knee joint, caused generally by sprains and chronic irritation from severe continued work.

Treatment.—For a serous effusion under the skin, cold applications or fomentations should be used in the early stages, followed later by friction with embrocation or a blistering ointment. Care should be taken to prevent the patient bruising the injured region.

If the swelling persists, it may require to be punctured at its lowest part to allow the contained serous fluid to escape, afterwards applying bandages soaked in astringent, antiseptic lotion (zinc sulphate or the "white lotion"), until the skin becomes adherent again. This operation, however, needs to be performed with caution, in order to avoid puncturing the tendon sheaths or joint.

(b) For distension of the sheaths of the tendons, cold applications should be tried in the early stages, followed by pressure bandages. Later, warm fomentations may assist absorption, but a blister is necessary in many cases, followed by a long rest.

The cause should be ascertained and removed, and whilst undergoing treatment the patient should be prevented from bruising the injured region.

Although these superficial swellings in front of the knee are frequently unsuspected they are rarely associated with acute lameness.

(c) Inflammation of the knee joint itself, with distension of its capsule. The swelling here is deep-seated and not very easily recognised. Professor Williams describes a chronic form of inflammation of this joint.

The *symptoms* are—"Stiffness in the movement of the knee joint, with a circular movement of the leg in bringing it forward; the heel is placed first on the ground, and the step of the lame leg is rather longer than the sound one. At rest, the animal stands squarely, with no inclination to raise the heel or bend the knee." The whole limb is not dragged forwards as in lameness of the shoulder. In all cases of disease of the knee joint, or the various structures surrounding it, there is always pain manifested when the knee joint is forcibly flexed or bent.

Treatment.—This consists of rest, hot fomentations, the application of bandages, followed later by a blister.

BROKEN KNEES.

"Wounds in front of the knee, usually sustained in falling, but they may be caused by striking against a manger, or other hard object. They are of all degrees of severity: 1st, simple loss of hair and slight abrasion of the scarf skin; 2nd, a severe bruise of the skin without laceration; 3rd, a wound extending no deeper than the skin; 4th, a wound laying bare the tendons and opening their sheaths; 5th, a wound laying open the joint and exposing the bones, with or without laceration of the tendons; and 6th, when the joint is opened, and the small bones of the knee broken."
—(Law.).

Treatment.—1st, with slight abrasions of the skin; no treatment is required beyond the observance of cleanliness; 2nd, if the skin is much bruised, tie the horse's head up to prevent him from lying down, and apply a bandage kept constantly wet with the white lotion (half-an-ounce each of sugar of lead and sulphate of zinc in a quart bottle of water); 3rd, in many cases in which the skin is cut through, a sort of pocket is formed, or the skin may fall down in a flap, or there may be much laceration of the skin. In all such cases all dirt, gravel, and foreign matter of any kind must be thoroughly cleaned out of the wound with luke-warm water, using plenty of it so as not to hurt the bruised tissues. Be careful not to remove any portions of skin, unless they are quite destroyed, "as it will be all wanted." After thoroughly cleaning the wound, dress it with a solution of carbolic acid, one in thirty of water, then dry the parts, and soak a piece of thick flannel, of sufficient size to cover the wound well, with Friar's balsam; bring the torn pieces of skin into their proper position, lay the piece of soaked flannel over them carefully, and fasten it there with a bandage. If the wound is carefully cleaned and disinfected and then dressed with Friar's balsam in the manner above described, I have seen the dressing remain on for days, if undisturbed, and the wound heal rapidly, without the formation of matter. So long as the piece of flannel adheres to the wound, do not disturb

it, but see that the bandage remains firm and properly adjusted. If matter forms the dressing will loosen, when the parts must be cleaned and dressed daily, and the bandages re-applied, using then the white lotion, with a little carbolic acid added. 4th. When the tendons are laid bare, and their sheaths opened, with an escape of synovia, clean out the wound thoroughly as above directed, but instead of dressing with Friar's balsam, soak a piece of flannel of sufficient size to fill the wound, with a solution of carbolic acid and water, one in twenty, and apply a bandage firmly over it; repeat this daily. I often apply a little pure carbolic acid at *first* to such a wound, as it tends to check the flow of synovia. 5th. When the tendons are cut through, and the knee-joint is laid open, similar treatment should be pursued, unless arrangements can be made for either placing the leg in a tub, and keeping it constantly covered with cold water, or allowing cold water to run on to it continuously by means of a hose pipe. Dress, and place the bandages on as directed, but keep up the cold water continuously until the acute inflammation subsides and the discharge of synovia ceases. I know of no treatment of open joint equal to the constant application of cold water. 6th. When the joint is opened, and the small bones of the knee broken, there is little hope of a successful recovery, and the animal would be useless, except for breeding purposes.

In all severe injuries to the knees, if both are injured the animal should be placed in slings, but if only one knee is injured he may bear the weight on the other limb without harm for a short time. With respect to pressure to the wound, when a deep one, the pressure by the pledget of flannel in and around the wound, and the bandage over it, hastens the process of granulation and the closing of the wound; never mind if a little proud flesh forms round the edges of the wound by the pressure, that can easily be reduced by applying a little powdered sulphate of copper to the edges after the bandage is taken off, but keep up the pressure until the wound is filled by granulations in the centre. It is necessary also, in open joint, to fix the limb by bandaging it from the foot and placing a splint over it to prevent all movement of the joint.

SPRAIN OF THE BACK TENDONS.

These are the tendons which pass down behind the canon bones, from the knees to the feet in the fore legs and from the hocks to the feet in the hind legs. The sprain generally occurs about midway between the knee and the fetlock in the fore leg and in the same relative position in the hind leg. In the majority of cases the tendons themselves are not really sprained, it is the fibres of a ligament which arises at the upper end of the canon bone, immediately below the knee and the hock respectively, and becomes inserted into the back tendons at this part, which become sprained or torn; the tendons may also become involved and thickened. This sprain occurs most frequently in the forelegs in riding and racing horses, and in the hind legs in heavy draught horses.

Symptoms.—When severe, there is heat, pain and swelling with acute lameness, the animal walks stiffly, digs his toe into the ground, and is very liable to stumble (if it is a fore leg that is sprained). In the hind leg, as Williams says, flexion is very imperfectly performed, the horse seems to throw the leg behind him as he lifts it from the ground. When the sprain is slight get some one to lift up the sound fore leg, then pass your fingers and thumb firmly down the course of the tendon: a slight thickening will be felt at the part, and the horse will flinch as soon as you press it. In cases where the tendons are involved, they can be seen and felt as thickened cords, sometimes all the way down to the fetlock.

Treatment.—Give rest, support the heel by putting on a high-heeled shoe, apply a bandage and cold water continuously. If you cannot apply cold water constantly, apply flannel bandages wrung out of boiling water, and change frequently. If well attended to in this manner, you may be able to prevent serious tissue change and chronic lameness. As soon as the pain and tenderness are removed, take off the high-heeled shoe, and put on a level one, and apply the following blister:—

Biniodide of mercury	1 drachm.
Powdered cantharides	1 drachm.
Prepared lard	2 ounces.

Mix and make into an ointment, and apply to the tendons with smart friction.* Give a long rest if the case has been a severe one.

In chronic cases, where the tendons become contracted, they are cut across and the limb extended; but that can only be done by a veterinary surgeon, and this handbook is not written for professional men.

SPRAIN OF THE SUSPENSORY LIGAMENT.

The suspensory ligament is the flat, strong, fibrous band, which arises at the top of the canon bone behind, and immediately under the knee and hock joints respectively, and passes down between the canon bone and the back tendons; a short distance above the fetlock joint it divides into two branches, each of which becomes firmly attached to the outside of the two little bones, called the *sesamoids*, which form both a groove and a pulley for the passage of the back tendons over the back of the fetlock joint; the branches of the ligament then pass downwards and forwards, until they meet and become blended with the fibres of the extensor tendon of the foot.

The seat of sprains may occur at any part, but it is much more common in one or both of the branches after it divides. If the ligament is completely torn across, the fetlock joint descends to the ground as this ligament is really the mechanical support of that joint, this is called "*breaking down.*" More frequently, however, the injury is less severe, there is a hard swelling, extending some distance up from the sesamoid bones, and the fetlock

* After applying the blister secure the horse's head in such a way that he cannot bite or lick the blistered part. This will be necessary during the first twenty-four hours, or so, or until the irritant action of the blister has ceased. See also footnote page 118.

joint behind appears much broader than natural. This, like sprains of the back tendons, occurs most frequently in the fore legs in racers, and in the hind legs in draught horses.

Symptoms.—These are very similar to sprain in the back tendons, (except in complete rupture when the fetlock joint descends to the ground). Make an assistant hold up the opposite fore limb, then pass your fingers and thumb down the lame leg along the course of the ligament; the horse will indicate the seat of pain when you come to it. This plan should be adopted in examining hidden lamenesses in all the limbs. When examining a hind leg in this manner, the foreleg of the same side should always be held up.

Treatment.—This is similar to that recommended for sprain of the back tendons, only when rupture takes place and the fetlock comes down, it must be supported by a pad placed under it in the pastern, and firmly supported by bandages. After the inflammation is subdued, apply a blister, which may be repeated, and give a long rest.

WIND GALLS.

These are soft, synovial swellings situated on each side of the back tendons, immediately above where they pass through the groove formed by the sesamoid bones. Simple wind galls are generally due to over-exertion.

Treatment.—Firm pressure by the application of cold bandages and cooling lotions when standing in the stable. Some apply pads over the swellings and then apply a bandage, but unless care is exercised the pads cause irritation of the bursa and produce inflammation.

SESAMOIDITIS, OR INFLAMMATION OF THE SESAMOID GROOVE AT THE BACK OF THE FETLOCK JOINT.

When inflammation has been set up in the sesamoid groove, or joint, it may be due to sprain of the tendons as they pass over the groove, or there may be inflammation of the cartilage which lines the groove, which may end in ulceration and disease of the bones themselves, ending in a stiff joint.

Symptoms.—The horse walks on his toe, the swelling which is in the seat of the wind-gall is hot, tense, and painful. (The swelling of simple wind gall on the other hand is always soft, and easily pressed.)

Treatment.—Rest. Put on a high heeled shoe, reduce the inflammation by continuous cold applications, which are best, or apply the hot bandages. As soon as inflammation is subdued, apply a blister, and give a good long rest. As Williams observes, after a good rest, the horse may come out comparatively sound, but if there is disease of the joint, he very soon becomes lame again.

There are many cases which assume a chronic form of inflammation, the animals going short and tender for a long time, until the swellings of the sesamoid joint become quite hard, and all gliding movements stopped, the poor animal going on its toe. It is cruel neglect to allow such a thing to occur, and more so to keep the animal at work.

Other swellings occur in the neighbourhood of the fetlock joint, such as, (a) a serous swelling under the skin at the fetlock, sometimes caused by knuckling over, or any external injury, (b) distention of the sheath of the extensor tendon as it passes over in front of the joint, and (c) a swelling in the pastern immediately below the fetlock pad.

Treatment.—Subdue inflammation by cold water applications and cooling lotions. Apply pressure bandages. Later, if necessary, blister.

INFLAMMATION OF THE TRUE FETLOCK JOINT.

This is not nearly so common as inflammation of the sesamoid joint, but still it does occur.

Symptoms.—The horse stands resting the leg a little in front of the other; there is inability to flex the joint, and when it is forcibly flexed in either direction it gives him great pain. There is also heat, tenderness, and swelling of the joint.

Treatment.—Similar to that for sesamoiditis.

SPLINTS.

The late Professor Williams defined splints as “exostoses due to a circumscribed superficial inflammation of the bone and periosteum.” These exostoses, or bony swellings, occur generally on the inner side of the large and small metacarpal bones (canon bones of the fore legs). Splints are most frequently found in young horses, but they also occur in old or mature ones.

The cause of splints is concussion, but some horses are much more liable to bony enlargements than others.

The importance of a splint depends upon its position; if it is situated on the side of the bones, away from the friction of the back tendons and not too near the knee joint, the unsoundness is generally of a very temporary character, but if near the joint, or interfering with the tendon, the question how long the animal may remain lame, cannot be answered satisfactorily.

Symptoms.—Splint lameness very often appears *before* the bony enlargement can be felt, hence the characteristic symptoms become of great value. A horse suffering from the pain of a splint in process of formation generally “walks sound and trots dead lame.” That is to say, it is the jar which causes the pain, not the mere movement of the limb (except in those cases where the osseous growth is pressing against the tendons or ligament, when he may walk stiff). The horse should be led out at a walking pace first, and then trotted smartly on a hard road or street, when the lameness will become marked, getting worse the longer he goes, the dropping of the head being extreme. Examine the leg as already directed, by having the sound limb held up by an assistant, and then passing your fingers and thumbs firmly down the side of the small bones of the leg, the horse will most likely wince when you touch the inflamed part. If he does not, take up the lame leg, bend the knee, and then run your thumb along the inner edge of the small metacarpal or splint bone, when you may find a small, bony nodule there, which the horse will indicate is painful as soon as you press it.

Treatment.—Rest, give the horse a dose of physic, and apply cooling lotions until the heat and tenderness subside, then blister; the latter, in protracted cases may require to be repeated. When the splint appears to interfere with the action of the tendon, give the patient walking exercise on sand or soft ground. I have seen many of these cases become rapidly sound when sent to work at the plough on the land.

To reduce a large splint the following tincture is sometimes very successful:—

Perchloride of mercury 40 grains.
Spirits of wine 1 ounce.

Mix and dissolve. This is to be rubbed on to the splint carefully, daily, until a thick scab or crust forms, which will be about the fifth day. Allow this scab to come off, then re-apply the dressing as before. It must be rubbed in lightly after the first day, so as not to injure the skin.

Instead of the above, the following blistering ointment may be applied:—

Binioidide of mercury 1 drachm.
Powdered cantharides 1 drachm.
Prepared lard 2 ounces.

Mix. To be rubbed in well with smart friction; a little may be lightly painted on the second day, if it does not appear to have "taken" well.*

INFLAMMATION OF THE CANON BONES, AND THE PERIOSTEUM COVERING THEM—"SORE SHINS."

This disease of the bones occurs in young race horses more particularly, but may be seen in others. It is generally due to hard galloping work at an age when the young growing bones are too soft and vascular to bear it. It generally affects the lower half of the canon bone, but may involve the whole of it, and in severe cases, the exudation may be so great and thrown out so rapidly, that complete separation between the bone and the periosteum takes place, ending in death, or necrosis of the bone. It is more common, I think, in the fore-legs, but I have frequently seen it in all four canon bones at once.

Symptoms.—"Lameness occurring after a gallop, insidious at first, the horse is restless, shifting his weight from one leg to the other if both legs are affected, if only one, standing with the foot pointed." If the inflammation is acute, there will be fever, and the bones are sensitive when pressed upon. Swelling is an early symptom; at first it is elastic, tense and doughy, to the touch . . . afterwards the swelling may become dropsical from effusion into the areolar tissue external to the periosteum, but it always maintains the elastic feel underneath the œdema." (Williams).

Treatment.—In mild cases, subdue the inflammation by the continuous application of cold water or cooling lotions, after which apply a cantharides blister. In the more severe forms, where there is great tenderness and doughy swellings, free incisions

* See footnote page 115. Never blister more than two legs at one time and do not repeat the blistering, until at least three or four weeks after the first application.

into the periosteum at several places may be required, but this operation lies within the province of the expert surgeon, and should not be attempted by the layman. After this, hot fomentations should be applied until the swelling is reduced, followed by cooling antiseptic lotions (such as the white lotion, with a little carbolic acid added). Keep the animal on a cooling laxative diet, and give one ounce doses of saltpetre in its food or water daily. When the soft swelling is reduced, apply a blister.

RING-BONES, OR BONY GROWTHS ON THE PASTERBONES.

There is some difference of opinion amongst authorities respecting the origin of ring-bones. Prof. Law says "these bony growths usually begin as inflammation of the membrane covering the bones—the periosteum—at such points as give attachment to ligaments," while Prof. Williams maintains that "as a rule, ring-bones are the result of ostitis, inflammation of the bone, commencing in the cancellated structure of the bones." Perhaps they are both right, certainly the deposits, which occur on the sides of the bones, termed *false ring bones*, appear to support Prof. Law's opinion, while those surrounding the articular extremities of the bones called *true ring bones* support the opinion of Prof. Williams. Be that as it may, ring-bones are bony deposits, or growths, found upon the pastern bones. They are divided into true and false ring-bones. True ring-bones are those which involve the joints, and are further divided into high and low; the ring bone is called high, when it involves the pastern joint, the enlargement being situated about the middle of the pastern; it is termed low ring-bone, when it involves the coffin joint, the enlargement being situated at the coronet. False ring-bones are those situated on the sides of the pastern bones, principally the upper one, and which do not involve either of the joints. Very large bony growths are sometimes seen in these situations, and yet the animal goes practically sound. As Williams says, "they may be compared to splints." True ring-bone involving either of the joints, invariably causes lameness, which is more or less permanent, although when the osseous deposit completely fixes, or locks the joint, and prevents any further movement in it, the animal may become practically sound for slow work, the pastern being merely stiff.

Symptoms.—Pain and lameness may occur before there is any manifest local swelling, but the manner in which the horse moves is characteristic. In true ring-bone, when the inflammation involves the joints, the horse puts his heel to the ground first. An exception is made, in the case of the high ring-bone on the hind pasterns, in which he is said to go on his toe, and knuckle over with the fetlock; but in all true ring-bones, where the deposit surrounds the joints in front, the heels are placed on the ground first, like a horse suffering from laminitis (but it may be easily distinguished from that affection by the absence of pain on tapping the foot at the toe). Forcible bending of the pastern and coffin-joints, will cause the animal to indicate pain. Firm manipulation of the parts, when the other leg is

help up and the weight thrown on the lame limb, will generally make him wince. Occasionally a ring-bone of considerable size, will be observed, although the horse may not have manifested any acute lameness, just as large splints sometimes appear before anyone is aware that such a thing has been in process of formation. Ring-bones are most common in the hind pasterns, and are due to severe strain, concussion, or any external injury. A hereditary predisposition is also recognised, as well as a structural tendency, "straight-up pasterns" are considered more liable to ring-bones, than are sloping ones.

Treatment.—Give rest. Reduce the inflammation by constant applications of cold water, or put a stocking poultice on. Cut off the foot of a man's stocking, draw it over the foot, fix the lower end round the hoof, above the shoe, fill it with wet bran, draw it up uniformly round the leg; then fix it on by rolling a large bandage round it from the bottom upwards, and pour in cold water at the top at short intervals. Although hot and cold water properly and reduction of inflammation, it is rare to find anyone in this Colony who will take the trouble to apply them properly. Give the animal cooling, laxative diet, and place one ounce of saltpetre daily in his food or water.

After the superficial inflammation is reduced, rub in the biniodide of mercury and cantharides blister, recommended for splint. This may require to be repeated. When a joint is involved, the only hope of a cure of the acute lameness lies in the joint becoming fixed or ankylosed.

HIP JOINT LAMENESS.

Disease of the true hip joint is comparatively rare, except when associated with fracture of the pelvic bone, involving this joint, or from a severe slip or wrench which injures the strong, round ligament which binds the articular head of the femur into its socket.

Symptoms.—In acute inflammation of the hip joint, the animal stands with the hind quarter slightly elevated, the whole limb being drawn up and the toe scarcely touching the ground; the pain on putting the foot down is so great that the animal stands persistently and can scarcely be made to move; acute pain is indicated if the hind leg is moved outwards and inwards in a lateral direction; there is rarely any external swelling, the joint being very deeply imbedded in the muscles, there is, however, rapid wasting of the muscles of the quarter.

The above are the typical symptoms, but they may be modified depending on the extent of the injury. It is well in all cases of severe lameness of this joint to oil the hand, insert it into the rectum, and place it against the hip joint, then make an assistant move the leg in various directions; if there is a fracture into the joint, you will feel the movement and crepitation, when the animal should be destroyed at once.

Treatment.—If lameness is severe, sling at once, apply hot fomentations continuously by laying several folds of a blanket wrung out of boiling water, over the quarter, and changing frequently. Put on a high-heeled shoe to assist in resting the limb.

I do not think that blistering does much good in hip joint lameness, the surface is so far from the seat of injury. Some recommend setons inserted deeply, while others fire. The principal thing is absolute rest, continued until the animal is sound. Friction and embrocation may be used after the pain subsides, to stimulate the wasted muscles of the quarter.

SPRAIN OF THE MUSCLES OF THE HIP, AND DISEASE OF THE HEAD, OR PROMINENCE OF THE HIP BONE.

This is a most common form of hip lameness, and arises from sprain of the tendon of the large muscle of the haunch, where it plays over the large prominence of the hip bone (this round prominence is generally called by mistake the hip joint). When a severe sprain of this tendon occurs there is generally a distinct swelling, with heat and tenderness on pressure. If the inflammation is severe it will extend to the membrane lining the bursa or sheath of the tendon, and even to the bone itself. The causes of this injury are severe strains, slips, or a direct injury from falling, &c.

Symptoms.—These are very similar to those of hip joint lameness, while the animal is standing, but there is not the same aversion to placing the foot on the ground. In moving, as Williams says, "there is a hop and a catch in the lame limb, and a want of movement in the quarter." When the limb is forcibly drawn forward, rendering the tendon tense, the animal evinces acute pain. By comparing the two joints, one may be able to detect a difference by the eye as well as by the touch.

Treatment.—This is similar to that for hip joint lameness, except that it may not be necessary to place the animal in slings. Apply hot fomentations. A high-heeled shoe should be placed on the foot. Afterwards apply a strong blister over the part. Rest is essential.

SPRAIN OF THE CRURAL MUSCLES.

These are the mass of muscles forming the anterior border of the thigh, and extending from the point of the hip to the patella on the stifle joint. The function of these muscles is to extend the leg, and when sprained or injured in any way, or when the nerve which supplies these muscles is injured or paralyzed, their function is arrested, hence the animal is unable to extend the limb properly, but drags the toe on the ground when walking. "Standing still, the patella seems to have slipped down, and there is knuckling over at the fetlock, the whole limb being held posterior to the other." (Williams.) In all cases of sprains, injuries, or paralysis of muscles, there is a tendency to atrophy or wasting.

Treatment.—This consists in rest, hot fomentations by means of cloths fixed round the part, followed by friction of the muscles, with a little embrocation.

STIFLE JOINT LAMENESS.

The stifle joint of the horse corresponds to the knee joint of man, and is the most complicated joint of the body. It consists of two articulations, the one formed by the patella or knee-cap,

and the groove at the lower end of the femur over which it glides and forms the prominence in front of the stifle joint; the other, the principal joint, which is formed by the two large round articular extremities of the femur and the head of the tibia or thigh-bone. It is further complicated by two biconcave, crescent-shaped, fibro-cartilaginous discs, which are interposed between the head of the tibia and the two round, articular ends of the femur. Either of these articulations may be affected with disease separately, or combined, but, as Prof. Williams says, "the pathology of both forms is alike—inflammation arises, which is followed by ulceration of the articular cartilage, and involving the two crescent-shaped discs, when the true joint is affected, &c."

Symptoms.—When the patellar articulation becomes inflamed, there is generally a tense swelling in front of the joint, which can be both seen and felt, especially when the joint is carefully compared with the corresponding one on the other hind limb. In standing, the stifle joint is bent and the knee-cap (patella) is relaxed. When walking, the leg is dragged with the toe near the ground, and is brought forward by a slightly outward movement.

When the inflammation is in the true joint, no external swelling can be felt, at least not usually, but the animal stands in the same manner, with the joint bent in a relaxed and resting position; in walking or trotting there is not the same difficulty in bringing the leg forward, as when the knee-cap is affected, but the stifle joint is carried in a rigidly stiff manner, all movement being prevented as much as possible, and the foot comes down to the ground flat. In fact, both the hock and stifle joints are carried stiffly, the principal movement being in the hip joint. One has to be guided entirely by the symptoms, and the absence of disease in any other part of the limb.

Treatment.—Put on a high-heeled shoe and apply fomentations, followed by a blister and a long rest; the latter is most essential. Many cases of stifle joint lameness after a week's rest, will appear quite sound, but if put to work, will invariably become lame again almost immediately. Nothing less than six weeks' rest should be given to a horse with stifle joint lameness, and if a severe case, twice that period.

LUXATION OF THE PATELLA, OR DISLOCATION OF THE KNEE CAP.

This occurs in young horses occasionally, although it is not nearly so common in this Colony, as among farm horses in England. The patella, or knee-cap, is always forced to the outside—the internal lateral ligament becomes stretched or torn, and the patella slips outward. In some young horses, from weakness or defective conformation, there is partial displacement of the patella, which will be heard slipping out and in as the animal walks. In complete luxation, the leg extends outwards and backwards, the foot resting on the tip of the toe, the animal being totally unable to bring it forward. The patella may be felt at the outer side of the stifle joint

Treatment.—Place a rope or rein round the horse's neck, then put a side line on to the pastern of the extended leg, bring the end through the rope round the neck, get an assistant to draw the leg forcibly forward, whilst you press the patella inwards,—it will return with a click. The further treatment consists in tying the animal up, so that he cannot lie down; apply a blister all round the stifle joint, and keep the patient quiet. In bad cases it may be necessary to leave the side line on the foot for a day or two, to prevent the leg from being set back and the patella re-slipping out.

SPRAIN OR LACERATION OF THE MUSCLE WHICH BENDS THE HOCK JOINT.

This is the muscle which is situated in front of the tibia, or thigh bone, and its tendon passes down in front of the hock. The action of this muscle is to bend the hock joint and extend the foot forward. When this muscle becomes severely sprained, or ruptured, the horse, in raising the leg to move it forward, is unable to bend the hock, or extend the foot properly, consequently the hock is brought forward in a straight position, with the leg and foot hanging in a "dangling" manner from it. Prof. Williams gives an illustration of a very aggravated case of this kind in his work on veterinary surgery. In this case, "the muscle was torn right across its whole thickness, and when the animal attempted to lift the leg, it was thrown upwards and backwards with great violence."

Treatment.—This consists of absolute rest and fomentations to reduce the inflammation and swelling, followed by stimulating embrocation and friction to the muscle.

SPRAIN OF THE HAMSTRING OR TENDO-ACHILLES.

These are the tendons of the gastrocnemii muscles, those powerful cords which are situated above the point of the hock, to which they are attached. They may become sprained or injured, and when cut through an animal is said to be "ham-strung."

Symptoms.—The leg is lifted with a sort of catch or jerk, similar to a horse with string-halt, and when the animal is standing, there is a knuckling over at the fetlock joints. If the tendon is sprained, a swelling will easily be detected by examination.

Treatment.—Rest, fomentations, followed by a blister.

BOG SPAVIN.

This is a fluctuating swelling on the front of the hock, situated towards the inner side. It may arise from dropsy of the joint, due to over-exertion merely, and resemble the soft compressible swelling of wind-galls, without either heat, pain or swelling. Or, it may be due to inflammation of the joint, when the swelling is tense, hot, and painful, and accompanied by severe lameness.

Acute inflammation of the true hock joint, unless promptly attended to and arrested, has a tendency to go on to ulceration of the articular cartilage, the formation of bony deposits, ending in complete ankylosis or locking of the joint.

Symptoms.—The horse stands resting the leg with the toe on the ground, there is a tense swelling on the front and inner side of the hock. When walking or trotting the hock joint is carried stiffly, and the toe strikes the ground first.

(In horses with straight hocks, there may be a puffiness about the seat of bog spavin, but it is soft and easily compressible, and manifests neither heat nor tenderness; such cases require no attention).

Treatment.—Consists in rest, hot fomentations applied by bandages around the hock, followed by a blister.

THOROUGH PIN.

This is distension, with synovia, of the sheath of the flexor tendon as it passes down the tarsal groove behind the hock joint, on the inner side of the os calcis, or bone forming the point of the hock. The swelling stands out on each side of the point of the hock—bulging through and through—hence its name thorough pin.

If the swelling arises merely from a dropsical condition of the sheath due to some slight cause, or from hard work, as in wind-galls, there may be neither heat, tenderness, nor lameness; but if the tendon is sprained the swelling will be tense, hot, and painful, and accompanied by more or less lameness, depending on the severity of the injury. In moving, the horse puts the toe to the ground first, and there is a tendency to knuckle over at the fetlock.

Treatment.—Give rest, put on a high-heeled shoe, and apply cold water continuously. If that is impracticable, reduce the inflammation by bandages wrung out of boiling water. As soon as the inflammation subsides, apply pressure; there are special trusses made for this purpose, but pressure may be applied by folding pieces of flannel to the size of the swellings, and applying pressure to these by means of bandages. These pieces of flannel may be soaked in arnica lotion, and changed two or three times a day, keeping up the pressure continuously. If pressure does not answer, or is impracticable, the application of a blistering ointment may be tried. "Thorough pins" of any standing are very difficult to reduce. Occasionally they have been successfully opened by puncturing them at the lowest part, pressing out the fluid, and injecting into the bursa tincture of iodine, but this operation should never be attempted by the inexperienced. *If thorough pins do not cause lameness, it is better to leave them alone.*

It is important to note that a large bog spavin will cause a bulging of fluid into the seat of thorough-pin, although a thorough-pin does not produce any bulging in the seat of bog spavin.

CAPPED HOCK.

There are two forms of this injury. The one is simply a serous swelling under the skin, uniformly diffused over the point of the hock. The other, and more serious form, is distension of the synovial bursa, or sheath, of either the tendon which passes over the point of the hock, or of the tendon which is attached to it. The swelling of this latter form of capped hock

bulges out *on each side* of the point of the hock, and is tense and painful. This form may be accompanied by severe lameness, more especially if the tendon or point of the bone has been injured, as inflammation and ulceration of the point of the bone may result. This second form of capped hock (when uncomplicated with the first or serous form) arises from a severe slip or some such injury. When the injury is caused by external violence, such as kicking, both forms are present, and the diffuse swelling is so large and tense, that it is impossible at first to tell which strictures are affected.

Treatment.—This is very similar in both forms. Hot fomentations and cooling astringent lotions, to allay the inflammation, to be followed by repeated blisters, such as the biniodide of mercury and cantharides. When there is severe lameness, as in the second form, put on a high-heeled shoe, and give rest. In the simple form rest is not necessary after the inflammation is subdued, except for a few days, when the blister is applied. Time, patience, and repeated blistering are generally required in successfully treating capped hocks. In simple cases a paste made of whitening, powdered chalk and vinegar, and pasted on, is said to be very good. Padding the side of the stall may be necessary, in order to prevent further injury to the hock.

BONE SPAVIN.

A bone spavin may be described as a bony enlargement on the inner and lower part of the hock joint, due to inflammation of the articular surfaces of the small bones of the hock; this is followed by ulceration of the articular surfaces and the formation of a bony deposit at the edges of these bones, which ultimately unites them together, and prevents any further movement between them. This definition is scarcely quite correct, nor quite complete, but I will try to explain: Many horses are observed with a large bony deposit at the seat of spavin, and yet go practically sound, in fact they have never been "off work," only they may have manifested a little lameness during the formation of the spavin. In such cases the inflammatory action is mainly at the surface of the bones, and the deposit of bony matter, is formed between the bone and its covering, the periosteum; and I am firmly of opinion that the inflammation in such cases commences in the periosteum, at the seat of attachment of the external ligaments which bind the bones together, and that its originating cause is sprain of these ligaments, and not inflammation of the bone. I know that this opinion is contrary to that held and taught by my friend and former teacher Prof. Williams, and I give it with much diffidence accordingly. Still, I have made careful post mortem examinations of spavined hocks which appeared to me to support this statement. Be that as it may, it is a fact that there are many horses with large spavins, which go practically sound, while there are others, where the bony enlargement is scarcely discernable, which go "dead lame." The latter, unfortunately, are in a large majority, and I quite agree with Prof. Williams that in all

such cases the inflammation commences in the cancellated structure of the interior of the bones, leading on to ulceration of the articular surfaces, the formation of bony matter, both between the bones, and on their external surfaces; ultimately, resulting in ankylosis, or locking of the bones together; after which the animal goes comparatively sound, but with a stiff hock. In those cases where the lameness persists, notwithstanding that the bones are locked together externally by a large, bony deposit, it is due, as Prof. Williams says, "to the destructive ulcerative action still going on between the articular surfaces of the bones, seen most commonly in old horses which are lacking in reparative power."

Causes.—These are severe concussion, from galloping or jumping, starting heavy loads, and slipping. A hereditary predisposition; just as some horses are predisposed to splints, and ring bones, so others are to spavins.

Symptoms.—When the disease commences within the bones, lameness will precede any external enlargement. The first thing noticeable is generally a stiffness of the hock; as the horse is moved from one side of the stall to the other, he will step over on his toe. The same thing will be observed during the first few steps, when he walks or trots away from the stable; this stiffness very soon passes off, however. As the disease increases, there will be a distinct catch or "jerk up" of the limb at starting, but until the lameness becomes very severe, it generally passes off after the animal becomes warm at his work, becoming intensified, however, on re-starting after each rest.

When standing in the stable, "the posture assumed by the patient is due to the action of the adductor muscles, the lower part of the legs being carried inward, and the heel of the shoe resting on the toe of the opposite foot." (Prof. Liautard.) In walking or trotting, the toe touches the ground first, and the heel is brought down slowly and reluctantly, while the quarter of the lame leg is raised, to be followed immediately by the dropping of the opposite quarter when the sound limb comes to the ground. There is also a want of flexion in the movement of the hock joint. If the horse be turned quickly round, by holding his head firm, and making his hind legs travel round (his fore legs being kept stationary as the axis of the circle), the lame leg will be moved with a catching or jerking action, while he treads with it on the toe only; in backing him, similar symptoms will be manifested.

A careful examination should be made of the hock joint, to ascertain if there be any nodular bony enlargement at the lower and inner part of the joint, near to its junction with the head of the canon bone. Carefully compare with both eye and hand the two hocks, and see if there is any difference between them. It is quite possible that in the early stages, no enlargement can be detected. In such a case, the absence of disease in any other part of the limb must be considered a negative symptom that the disease is in the hock joint.

The late Professor Coleman is reported to have given his students the following advice:—"If a horse is lame in a fore

leg, and you cannot find anything to account for it, swear that it is in the foot, and if he is lame in a hind leg and you cannot find anything to account for it, swear that it is in the hock, and in ninety-nine cases out of every hundred you will be right." The maxim is well worth remembering, for the majority of hidden lamenesses are in the foot and hock of the fore and hind legs respectively. In all cases where the lameness is not very pronounced, send the horse out for a good hard ride or drive; after his return, let him stand for an hour in the stable until perfectly cool, then have him led out, and watch his first movements; if there is disease of the joint it will manifest itself by the characteristic lameness.

Treatment.—This consists in rest, a high-heeled shoe, a dose of physic; fomentations and cooling lotions for a day or two, followed by a blister, the biniodide of mercury and cantharides ointment acting as well as any. Firing is often resorted to in this and many other lamenesses, but as that should be performed by a veterinary surgeon, he would exercise his own judgment. As Professor Law says, "all methods (of treatment) may do well in young horses, with no constitutional infirmity, and all will fail in some old subjects."

BLOOD SPAVIN.

This is simply a fulness of the superficial vein of the leg, as it passes over the inner side of the hock joint; it is rare that there is any disease or varicosity of the vein itself, the distension of the vein is due to pressure, either from a bone spavin or to any distension of the bursa of the joint. The prominent appearance of this vein is, therefore, symptomatic of local enlargement or disease of the parts which the vein passes over.

CURB.

This is an enlargement situated at the back of the hock joint a few inches below the point of the hock, in the central line from the point of the hock downwards. Standing at right angles to the leg, it appears as a curved swelling, and if you run your fingers straight down the central line from the point of the hock, the "curb" will readily be felt, if present. In the early stages there is a soft diffused swelling, as the tissues immediately under the skin are slightly involved, but in an old standing curb the swelling is firm and unyielding.

Some little difference of opinion exists as to the structure which is injured or sprained in curb. Prof. Williams and others maintain "that it is sprain of the calcaneo-cuboid ligament, a strong fibrous band which unites the posterior border of the calcis to the cuboid and head of the small metatarsal bone;" while Prof. Pritchard and others, are equally certain "that it is a sprained and inflamed condition of the synovial sheath placed between the perforatus tendon, and the annular ligament of the hock." My own examinations tend to confirm the latter opinion, but, as the structures referred to are all closely contiguous to one another, I fancy that the different opinions entertained are due to a difference in the structures involved in indi-

vidual cases examined, and the varying periods after the injury at which the examination takes place.

Causes of curb are violent exertion, slipping, &c. Many horses have "sickle-shaped hocks" very liable to curb, while in others the head of the external small metatarsal bone stands out very prominently and may be mistaken for curb, but in this case bony prominence is on the *outside* of the median line, while the curb is in the centre.

Symptoms.—Lameness, the characteristic swelling described; the horse goes on his toe, and also rests on his toe when standing.

Treatment.—Many people apply a blister at once to a curb and scarcely lay the animal off work, but if the pain and lameness is severe it is cruelty to adopt such a practice, still, I admit the advantage of the early application of a smart blister in this form of sprain. Rest, apply cold water, and cooling lotions such as the white lotion, and follow this, in a day or two, by the application of the biniodide of mercury and cantharides blister. If very lame, put on a high-heeled shoe.

OVER-REACH, TREAD, SPEEDY CUT, AND BRUSHING.

An *over-reach* is a wound inflicted by the hind foot on the coronet of the forefoot at the heel.

Treads are the wounds inflicted by one foot, either fore or hind, on its fellow.

Speedy cutting is the hitting of the foreleg anywhere above the fetlock joint, by the opposite foot.

Brushing is the hitting of the fetlock joint or coronet with the opposite foot.

Over-reach generally occurs when galloping or jumping, but may occur while trotting in a horse that over-reaches, or over-steps, the fore feet by the hind.

Wounds to the coronets, by either treads, over-reaches, or similar injuries should always be carefully attended to, lest they develop into intractable sores, and end in quittor.

A horse that "speedy-cuts" should have his shoes carefully put on so that they do not project beyond the hoof on the inside, while the nails and edge of the hoofs should be kept smooth. If a horse "dishes" inwards and turns up the inner edge of the hoof as he extends the leg, he should be shod with a shoe thin on the inside, and kept well within the wall of the hoof, with no nails on the inside quarter.

Brushing frequently occurs in young, green, untrained horses, or horses that are tired from overwork or a long journey. It is most common in the hind legs. If it arises from defective conformation or action, very little can be done. Generally, if a horse brushes with only one foot, the condition may be modified by raising the inside of the foot which is "brushed" by thickening the inside of the shoe and bringing it straight back at the heel, at the same time thinning the outside half; this will tend to throw the fetlock out when the foot is resting on the ground. The inside of the shoe of the opposite foot with which he cuts, should be kept well

within the hoof, and the nails and wall kept smooth. If he brushes with both feet, raise the inside of both shoes, and lower the outside. Note, that it is necessary to bring the shoe straight back at the heel leaving it a little longer than natural.

Protectors to the fetlocks are often worn when brushing cannot be prevented in any other manner. There are many varieties of these protectors, such as leather boots, thick india-rubber rings, &c., but one of the most effective is a piece of saddle cloth or rug, or any similar thick woollen stuff. Cut a piece of sufficient width to go round the fetlock joint, and of sufficient length when doubled to cover the fetlock, then get a soft leather strap with buckle and holes punched close together, to enable it to be adjusted correctly; fold the cloth round the fetlock, fasten the strap round it at the middle (which should be round the leg immediately above the fetlock), and then double down the upper half of the cloth over it so that the two ends are even below the fetlock. Such a protector will guard the fetlock, will not chafe the joint, and it cannot be displaced.

When the fetlock joint is inflamed and swollen from brushing, reduce the inflammation by hot fomentations, or bandages wrung out of boiling water, and the application of cooling lotions. If thickening remains, apply a blister

DISEASES OF THE FEET.

THE PROPER METHOD OF SHOERING HORSES.

Before describing the diseases of the feet, I shall make a few observations on the proper method of shoeing horses.

Horse-owners and farriers generally consider that the proper method of preparing a horse's hoof for the reception of the shoe is to hollow out the sole as thin as possible, and to cut away the frog to give it a neat and symmetrical appearance. The bars are then cut through to give the heels an appearance of width and openness, while the finishing touch consists in neatly rasping the wall of the hoof all round from the coronet to the sole. This is generally considered a neat and highly finished work of horse-shoeing!

Now, I need hardly state that when a horse's hoof undergoes such an elaborate process of preparation as the one just described it is evident that the farrier who executes the work knows nothing of the organ which he has been mutilating, or of the physiological function of its several parts. *When a horse's hoof is shod on sound physiological principles, neither the sole, the frog, nor the bars should ever be touched with a knife, and a rasp should never be allowed to touch the wall of the hoof above the clinches of the nails.*

In support of the above assertions, let us consider which parts of a horse's hoof wear through the most readily when worked without shoes. Is it the parts which the farrier cuts away with his drawing knife in order to prevent them from coming into contact with the ground—the *sole, frog, and bars*? Certainly

not; you will invariably find that when a horse is worked on hard roads without shoes, his hoofs become tender first at the *toes*, less frequently at the *soles* but very rarely in either the *frogs* or *bars*. These latter, in a sound foot which has never been mutilated, improve both in health and functional power the more they are allowed to come into contact with the ground. This fact can be very easily demonstrated. Let anyone take a horse whose frogs have become atrophied and his heels contracted from the continued abuse of the farrier's knife, and let such a horse be shod with tips instead of shoes, so that his frogs and heels may come into immediate contact with the ground; the improvement which will be observed in his frogs and heels at the end of a few months will be surprising, the beneficial change being due entirely to the healthy action which is set up in these parts by their being allowed to come into direct contact with the ground.

When a horse is shod with tips, however, care should be taken to lower the toe as much as possible with the rasp, then taper the tips nicely towards the quarters of the hoof where they terminate, so as to interfere as little as possible with the proper level of the sole of the hoof.

From what has been said it will be apparent that the objects aimed at in applying a shoe to the horse's foot are (a) to protect the parts which are subject to undue wear, and (b) to interfere as little as possible with the parts which require no protection.

The question, then, arises: By what method of shoeing can these two objects be best attained? It is a comparatively easy matter to protect the parts which are subject to undue wear almost any form of shoe, nailed round the wall of the hoof will accomplish that; *but to protect such parts and not interfere with the functional action of the other parts, is where the art of shoeing comes in.* Every organ of the body has a certain function to perform, and upon the proper performance of that function the healthy vitality of the organ depends, for, should the conditions under which it normally acts be in any way interfered with, for better or for worse, in the same direction and in a proportionate degree will the organ become either more fully developed or more deteriorated in character.

If, therefore, the frog and bars of a horse's foot are prevented from coming into contact with the ground and from exercising their proper functions, they must necessarily become atrophied in consequence; it will be evident therefore, that, in preparing a horse's foot for the application of the shoe, it is not only necessary that you refrain from cutting away any portions of the frog or bars, but you must also make your shoe of such a shape that, when it is applied to the hoof, it will allow these parts to come into contact with the ground and thereby enable them to perform their healthy functions.

This leads us to the consideration of the form of shoe which is best adapted to meet these requirements—a subject upon which much has been written, “the writers embracing all classes of men, from peers of the realm, down to grooms and shoeing smiths.”

It is unnecessary in this article to refer to all the different forms of horse shoes which have been recommended even in recent times, or to discuss special forms of shoes adapted to diseased or deformed hoofs; for, as a rule, the hoofs of the Cape horse are naturally sound and well-formed. A slight modification of the ordinary level shoe is all that is generally required for a healthy hoof, and the only modification necessary is that the shoe should be narrowed from the last nail holes to the heels, so that it rests *only* on the outer wall of the hoof at these parts.

In preparing the foot for the application of such a shoe, the drawing knife should be dispensed with; the walls of the hoof are lowered down and levelled by the rasp only, unless the foot has been allowed to be overgrown very much; the *frog* is not to be cut in any way, neither should the *bars* be cut through; what is termed "opening the heels," by cutting through the bars on each side of the frog, has exactly the opposite effect, for that operation cuts away the chief support of the wall of the hoof there, and permits the heels to contract. The shoe, then is to be made perfectly level, and fitted on hot. Very many horse-owners entertain the idea that it is very destructive to a horse's hoof to fit a hot shoe on it. "The evils supposed to result from hot-fitting are, however, purely chimerical. If the shoe be made perfectly level, which should always be done, it is obvious that the foot must be made level also, to enable the farrier to bed it properly, and this can be much more perfectly done when the shoe is hot than when it is cold. I must not be understood to recommend that the farrier is to burn down the foot level with a hot shoe; he is only to ascertain by means of the hot level shoe where any unevenness in the sole surface of the hoof exists, and remove such unevenness with his rasp.

If a shoe such as the one I have described, viz., one gradually narrowed from the last nail-holes to the heels, so that it rests on the wall of the hoof only at these parts, and does not press against the edges of the frog,—is applied perfectly level, all parts of the foot calculated to bear weight are called upon to perform their natural functions; the various structures are kept in their proper and relative position; the frog is allowed to come to the ground as nature intended it to prevent concussion, the weight of the animal's body being diffused over an extended surface, and not limited to the wall alone, as happens in the common method of shoeing.

In order to show the common sense of this method of shoeing, let us consider briefly the different parts of the horse's foot.

The bone of the foot, commonly called the coffin-bone, from its being enclosed in the horny hoof as in a coffin, is shaped somewhat like a half-moon, and fits into the horny box very exactly; its upper surface is covered by the horny wall, while its sole surface is covered by that portion of the horny sole which extends in front of the frog, and round on each side of the grooves which are situated on each side of the frog. The frog and the structures above it fit into the hollow of the half-moon-shaped foot-bone.

Now, when a horse is unshod it is the horny sole covering the foot bone in front of the frog which becomes worn through, exposing the sensitive, vascular covering of the bone, and causing acute pain and lameness. If you make a section through the frog, if it is healthy, you will find that it is somewhat like tough india-rubber in its character and appearance, and capable of a great amount of wear. Immediately above this tough india-rubber frog, you will find a soft pad or cushion. This soft cushion is composed principally of a framework of elastic fibres, holding in its meshes a yellow pulp, principally fat, and is very resilient in its nature. In connection with this soft, elastic pad are two plates formed of cartilage or gristle. These plates are attached to the two wings of the half-moon-shaped foot bone, and can easily be felt immediately under the skin at the top of the coronet on each side of the heel, and you will observe that when an unshod horse's fore foot comes to the ground, the coronet bulges out where these plates are situated. If healthy, these plates yield readily to pressure, and spring back again whenever the pressure is removed showing that they are possessed of considerable resiliency. After removing the pad of fat already described, you will see the strong fibrous tendon which passes down the leg, over the fetlock joint, and here passes over the navicular bone, becoming attached to the centre of the half-moon-shaped coffin bone. The coffin and navicular joints are thus situated immediately above the centre of the frog, and the line of the greatest weight of the limb passes through the coffin joint and comes out near to the point of the frog.

From the above description it will be easily understood that when a healthy fully developed horse's hoof comes to the ground, the part that meets the ground first, if not prevented by a shoe, is the frog; the centre of weight also falls near this part. What happens, then, when the horse's foot comes to the ground? The tough india-rubber frog receives the concussion, and conveys it to the fatty, elastic pad immediately above it; this elastic pad yields to the pressure from below, and bulges up on each side of the heels and presses against the two plates of gristle situated there; these also yield corresponding to the amount of pressure brought to bear upon them by the fatty pad.

From the frog as the centre of the weight, therefore, the concussion becomes evenly distributed over the entire foot, while the direct concussion on the frog itself is relieved as above described. This also is Nature's method of opening the heels, for, if the bars are left entire and the frog untouched, these parts will grow in strength and improve in quality, from having to bear their proper share of the weight and concussion when the foot comes to the ground. Need I say more to convince every intelligent horseman and farrier of the utter folly of trying to improve *Nature's* handiwork, in the shaping of a healthy horse's foot.

I readily admit that there are feet, such as *club feet*, *crooked feet*, and *flat feet* which require the exercise of art and judgment to bring them, and keep them as near to the natural shape as possible,

but even in such cases, the trimming and alterations necessary, consist mainly in keeping the heels low, and reducing the walls to the healthy shape; it is very rare that the frogs and soles require to be interfered with. Even in the case of a convex sole, a hollowed out shoe should be made to fit the foot and not the foot hollowed out to fit the shoe.

NAVICULAR DISEASE, OR INFLAMMATION OF THE NAVICULAR BONE AND SHEATH.

The navicular bone is a small, flattened, oblong shaped bone, situated immediately behind the coffin bone, and forms with it the articular surface in which the inferior extremity of the coronal bone moves, called the coffin joint. Its most important function, however, is that of a pulley or lever, under which the tendon of the flexor pedis muscle plays, immediately before it becomes inserted into the lower crest of the coffin bone. It will be observed, therefore, that while the upper articular surface of this small bone forms part of a joint with the coronal and coffin bones, its lower and larger articular surface, is in connection with an important bursa of the flexor pedis perforans tendon, called the navicular bursa. This synovial bursa with its surrounding structures is called the navicular sheath. These are the structures which are involved in navicular disease—the navicular bone, the fibrocartilage which covers the bone, the synovial sheath, and the tendon of the flexor pedis perforans.

A considerable difference of opinion has been expressed by different authorities respecting the particular structure which becomes first affected in this disease, but the opinion first clearly expressed, I believe by Mr. Broad of Bath, afterwards so ably supported by Professor Williams, gained general acceptance. It is this, that the inflammation has its origin in the cancellated tissue in the interior of the navicular bone, leading to changes in the bone, bursa and tendon (all of which structures are implicated more or less in the diseased process). Williams says, "inflammation having been set up in the vascular, cancellated structure of the bone, the progress of that inflammation may lead to a variety of changes, both within its interior and upon its articular surface. In one instance to the deposition of small calcareous spots upon and within the cartilage; in another, to the formation of large curious looking cavities, exposing the vascular interior of the bone, with gradual removal of the bone, its texture at the same time becoming friable, until at last it may become fractured by some trivial accident, &c., &c."

Causes of navicular disease are "a rheumatic tendency and concussion" (Williams). Veterinary authorities class navicular disease amongst hereditary diseases, and Williams says that this hereditary predisposition is due to a rheumatoid diathesis, or a tendency to rheumatic inflammation of the joints, which becomes developed under certain circumstances, such as severe work, followed by a long rest in the stable, more especially when the floor of the stall rises too much towards the manger. Under such circumstances, a horse when resting, has to place

his fore feet back under his body in order to support his weight and balance himself when asleep. Williams rightly states that in a healthy, oblique pastern the navicular bone bears no direct weight from the bony column of the limb; its function is to give increased leverage power to the tendon. But that refers to the position of the bone when the horse is standing in his natural position on a level surface, or when in motion. It is quite different when the fore-legs are placed back under the body, when the horse is standing at rest on rising ground, or asleep on the level. In such positions "the line of weight passes right through the navicular joint, and the navicular bone acts as a mainstay to the coffin joint, and the more the coffin joint needs staying the tighter and firmer is this wedge bone pressed in the cleft by the perforans' tendon. The navicular bone, having an extremely precarious nutriment supply, and being compressed for hours together, no wonder that disintegrating changes take place in it so often as they do" (Fearnley).

Irregular work and long rests, standing still during intervals, are a cause of navicular disease. I think that it is well borne out by experience in this Colony. In the country districts of the Colony, navicular disease is comparatively unknown, because as a rule when a horse is not at steady work, he is turned out during a portion of the day, at least, for a run; the great majority being turned out all day. In the towns, on the other hand, navicular disease is not uncommon, due, doubtless in a great measure to irregular exercise, combined with badly constructed stable floors.

Horses with straight pasterns are much more liable to navicular disease, than those which have long sloping pasterns, for the reasons already given. Small narrow-footed horses are said to be more liable to the disease than those which have good wide open feet, "because the radiation of the rays of weight is limited to a narrower area, and the shock is consequently the greater to the foot" (Fearnley).

Bad shoeing is also a fruitful cause of navicular disease, such as thinning the sole, cutting away the frog, and preventing those parts from receiving the weight and distributing the concussion, when the foot comes to the ground, which *Nature* intended them to do. Allowing the heels to grow too high has the same effect of throwing the weight more on the navicular joint, and preventing the frog from coming to the ground.

This is well illustrated by the fact, referred to by Professor Williams:—"That race horses, so long as they are shod with racing shoes, rarely suffer from navicular disease: the pace with them tells upon the column of weight-bearing bones and upon the ligaments and tendons, but when put to harness-work, in carts, omnibuses, &c., and shod with thick shoes, they soon become unsound," the frogs and sole being no longer allowed to bear weight. But in addition to the difference in shoeing, race horses and hunters are generally allowed to stand in a loose box, where they can not only move about but rest in the most natural and easy position,

which they cannot do when tied up in a stall, and that a bad one.

Other and accidental causes of navicular disease are direct injury to the joint from a stone becoming fixed in the foot, a puncture by picking up a nail &c., &c.,

Symptoms.—The symptoms of navicular disease are divided into *negative* and *positive*. The negative symptoms are arrived at by a process of exclusion; after a careful examination of the leg and foot, if we find no other apparent cause for the lameness, we suspect that it may be navicular disease, and we direct our attention to the positive symptoms which are as follows: In the stable, the horse "points the foot," if only one is affected, but if both are affected, he will frequently shift the weight from one foot to the other in an uneasy manner "pointing" them alternately; there may be increased heat in the hollow of the heel, and throbbing of the arteries on each side of the pastern. When brought out of the stable, if only one foot is affected, he puts the toe to the ground, and manifests a great tendency to stumble, as he is afraid to put the heel down firmly. If both feet are affected, the animal walks on his toes, with a short pottering step; his shoulders are stiff, and his pasterns upright. After he has gone some distance, the lameness becomes less, or may entirely disappear. The lameness is always worst at starting, more especially after having had a severe run. There is very frequently a red appearance of the sole, near to the sides of the frog, and striking the sole on that part with a hammer invariably causes acute pain. The shoes are also unduly worn at the toes.

In some cases all these symptoms develop suddenly, but there are others in which they come on very slowly. A horse may be observed to be lame after having been shod, and the shoeing is blamed; this lameness may disappear and return again at short intervals, until it gradually become constant, when the characteristic symptoms manifest themselves.

Treatment.—Few cases of navicular disease recover. Many people dig a hole in the stall, and fill it with cold water, and make the horse stand in that all day, they then put cold poultices on his feet at night, and place him in another stall, where he can lie down. This requires to be kept up continuously; there is nothing better than hot or cold water if properly and continuously applied. After the pain and lameness have ceased, a good plan is to apply a blister round the coronet, then after a few days to turn the horse out into some soft grass paddock, and let him run for a month or more without shoes. Frog setons, and neurotomy are often resorted to, but these operations require some skill.

Proper shoeing is very important—the toes should be shortened and leathers or pads may be applied.

At the commencement of treatment a dose of physic should be given, and the animal should receive a cool, laxative diet.

Prevention.—This consists in proper shoeing, properly constructed stalls or boxes, and regular exercise.

SIDE BONES OR OSSIFICATION OF THE LATERAL CARTILAGES.

The lateral cartilages are two thin plates of fibro-cartilage, situated, one on either side of the coffin, or foot bone; they project above the hoof, on each side of the heel, and can be felt in that situation, as yielding resilient plates. It is these cartilages which permit of that expansion of the heels at the coronet, which is observed each time a horse' foot comes to the ground, more especially if it be a healthy foot with a full, strong frog, taking its proper share of pressure when the foot comes to the ground.

These lateral cartilages are liable to take on diseased action, and become converted into bone—ossified—through a deposition of bony material in their structure. They then become hard and unyielding, and no longer permit of proper expansion of the soft structures of the foot at the heels. As a consequence, the horse goes lame from pain in the diseased cartilages themselves, which is doubtless increased by the pressure of the soft parts against their unyielding surfaces.

Symptoms.—The horse walks lame with a short, stilty step, and holds the pastern straight, to avoid pressure on the heels. Even when the animal is not perceptibly lame, his tread has lost its natural spring and firmness. An examination of the heels by pressure with the fingers, will detect a hard unyielding bony structure, instead of the pliable cartilage of health.

Causes.—Improper shoeing, cutting away the frogs, concussion on hard roads, and injuries to the coronet. Although most common in heavy draught horses, sidebones occur also in riding and driving horses.

Treatment.—Rest, put on a bar shoe, and relieve the bearing of the foot under the quarters by allowing the bar of the shoe to rest evenly on the frog. Apply a smart blister to the coronet. By careful shoeing the horse may go comparatively sound, at least for slow work. Firing, neurotomy, and cutting a vertical section through the horny wall of the hoof over the cartilages in order to relieve the pressure, are all modes of treatment, but these can only be performed by professional men.

LAMINITIS FEVER IN THE FEET, "FOUNDER."

These are the names given to inflammation of the sensitive laminæ of the foot. The sensitive laminæ are those very fine and highly vascular thin plates which cover the surface of the foot, and which dovetail into similar grooves and plates situated on the inside of the horny box or hoof. Those covering the foot are called the sensitive laminæ, as they are richly supplied with blood-vessels and nerves. Those lining the horny box, or hoof, are called the insensitive laminæ, as they are not supplied with nerves, and derive their nourishment from the sensitive laminæ with which they are in immediate contact.

Acute inflammation of the sensitive laminæ, is one of the most painful affections to which the horse is liable; the highly vascular character of the structures affected, and the unyielding

nature of the horny-box enclosing them, pressing upon the congested and inflamed vessels, cause the pain to be both intense and persistent.

There are, of course, varying degrees of the inflammatory action; acute congestion with slight inflammation of the foot, may pass off without leaving any marked structural change, the inflammatory exudate being gradually absorbed, in the same manner as the products of inflammation are removed from any other inflamed structure. In other cases, however, although there may be no visible alteration in the external shape and appearance of the foot, the inflammatory exudate may have been sufficient to cause a separation of the sensitive from the horny laminae, and its subsequent absorption may leave a space between them which becomes filled with a kind of connective tissue, or imperfectly formed horny material constituting one form of "seedy toe." This condition of the foot is often met with, when there has been no preceding acute inflammation or lameness, the inflammatory action being of a sub-acute or chronic character; there is merely a tendency to altered secretion due to impairment of the secreting function of the laminae.

When the inflammation is severe and continues for some time, the inflammatory exudate increases very rapidly and as it is most abundant at the toe, it may press upon the bone of the foot, forcing the toe downwards to the sole, while the horn of the upper crust, or wall, is pressed upwards round the toe, producing what is called convex or "pumiced sole." As Holcombe says, "depression of the coffin-bone is not a sufficient cause within itself, to cause pumiced sole, for if the relative change in the bone takes place slowly, or if the horn is thin, the sole becomes convex from the gradual pressure, and the soft tissues adapt themselves to the change without having their function materially impaired. But when the dropping is sudden, and the soft tissues entirely destroyed, the horn rapidly crumbles away, and the toe of the bone comes through. In many of these cases the soft tissues remain uncovered for months, and when they eventually become covered it is with a thin, slightly adherent horn, that bears but little or no wear." Or as Williams says,

the secreting powers of the sensitive sole becoming interfered with, partly arrested or perverted, the horny sole remains thus weak, cheesy, or spongy, like macerated horn, or even grumous, affording but little protection to the sensitive parts within. . . . The foot bone being pressed downwards by the exudate, becomes absorbed at its borders."

Suppuration (or the formation of "matter") may occur, extending from the toe backwards and upwards to the coronet, involving the sole surface also, resulting in the sloughing off of the hoof. In other cases the formation of "matter" will commence at the coronary band, causing separation of the hoof which is ultimately shed, although it may be slowly. When laminitis is due to concussion of the sole, or from standing a long time continuously, as during a long sea-voyage, or from bearing the whole weight of the body on account of some lameness in the

other leg, or from direct injury, matter very frequently forms first at the sole. This is not so serious, as it can be easily let out. Great care must be exercised, however, in making an opening to allow the matter to escape, not to lay bare any more of the sole than is absolutely necessary, lest inflammation of the laminae increases, and you get a bulging sore with descent of the bone; cut down carefully between the sole and the wall, you will very soon find where the matter is, as there will be a separation of the sole from the laminae; then pare the edge of the sole at the part just sufficient to give the matter exit, and apply a poultice. After the inflammation is reduced, and the matter has escaped, new horn will form over the laminae underneath the separated horn, when the latter can be gradually removed. In some very severe cases the whole structures of the foot become involved, leading to inflammation of the bone and its covering the periosteum, ending in gangrene of the soft parts, and caries of the bone. In such cases the accompanying fever and pain are so severe that the animal generally dies.

Causes of Laminitis, are hard work; long journeys; severe concussion from fast work on a hard road; continuous standing; exhaustion from long continued exercise, more especially in fat, or untrained, badly conditioned horses.

It may follow indigestion, or derangement of the digestive organs, such as superpurgation, or purging during a journey. Certain kinds of food, more especially a large feed of wheat, is very apt to produce inflammation of the feet, even when there is no apparent disturbance of the digestive organs. It may supervene in certain diseases of the chest, such as pleurisy or pneumonia. This is in great part due, I think, to the fact that the horse stands persistently, when suffering from acute chest affections. A large drink of cold water given to a horse when heated and exhausted, is also liable to induce an attack. In the mare laminitis may follow parturition, occurring especially as a complication of metritis (inflammation of the womb).

Symptoms.—These generally appear soon after the horse arrives in the stable, very rarely while at work, still they may appear when the animal is on a long journey, and are very characteristic. Laminitis is most commonly met with in the fore-feet as they have to bear the weight. When one foot only is affected, it generally arises from some direct injury, or from its having to sustain the weight of the body, due to some disability in the opposite limb. In such a case no weight, or very little, will be thrown on the inflamed foot, and if made to move, if a fore limb, the horse will carry it and hop on the other, or he places the heel of the lame foot on the ground very carefully, bringing up the other leg as quickly as possible. If in a hind leg, it is placed well forward, and the other leg brought quickly up.

When both fore feet are affected, the horse stands with his fore feet extended, resting his weight on the heels, while the hind legs are drawn forward under the body as far as possible, to relieve the fore legs of the weight. If made to move, he will do so very reluctantly; in very acute cases, it is almost impossible to

induce him to attempt to walk. When he does so, he balances his weight on his hind legs, and then shifts both the fore legs, with a kind of hop, bringing up the hind legs with a quick shuffling movement. If he lifts the fore legs singly, he does so very carefully, placing the heels carefully down, and throwing the weight off the body back on his hind legs. He cannot back, and if one tries to turn him round, he will swing round on his hind legs as on a pivot.

When the inflammation is in the hind feet, his hind legs are placed under him, throwing the weight on to the heels, but the fore feet are drawn back under the body, to support as much of the body weight as possible. In fact, as Williams says, "he stands all of a heap," and walks with extreme difficulty.

When all of the four feet are affected, the horse stands balancing himself on the heels of all his feet, constantly shifting and easing one foot after the other.

In many cases of inflammation of the fore feet, the animal will stand persistently, for the first two or three days, until quite exhausted, and requires to be laid down. Others again lie down early in the attack, and lie continuously, and are much relieved accordingly. As Williams observes "very often the pulse will fall twenty to thirty beats in the minute, in the course of a quarter of an hour after the patient has lain down. When the horse lies down, he lies flat on his side, with the legs and feet extended.

The general symptoms are a quick full pulse, breathing quickened, and nostrils distended—blowing; the patient eats very little, but his thirst is increased; he has an anxious, uneasy look, and there will be a trembling of the muscles of the fore quarters, as he uneasily moves his feet. There may be patches of perspiration also, but the symptoms cannot be mistaken; if you attempt to make the animal move, or tap lightly on his feet with a hammer, the seat of the trouble will be apparent.

Treatment.—The first thing is to take the shoes off, and rasp the walls down level with the sole. If the pain is very acute, it may be necessary to cast the horse to do this; then put the inflamed feet into large bran or linseed meal poultices. The next question is whether the poultices should be kept hot or cold? In this particular inflammation, I prefer cold, but it must be constantly, and continuously applied. It is quite true, as Williams says, that warm fomentations or poultices have a soothing effect by relaxing the tissues, but in the horse's foot, there is little room for expansion, besides, in this complaint, our efforts are directed to prevent a rapid effusion of inflammatory exudate. Apply cold water, therefore, freely and continuously, until the acute pain ceases, which in most cases, under proper treatment, will be within a week. If the horse does not lie down, make a comfortable bed for him and lay him down, and if he lies persistently, as some do, turn him twice a day, to prevent chafing. Do not allow the poultices to become alternately hot and cold, by applying the cold water at long intervals only. Unless proper attention be given to such a case, the animal is almost certain to lose his hoofs.

Respecting the general treatment, if the bowels are constipated, give a pint of raw linseed oil, but if the inflammation is induced by purging, care must be exercised not to irritate the bowels, the constipation may be relieved by injections of warm water. If the pulse remains quick and strong, in such cases give ten drops of tincture of aconite every hour, and $\frac{1}{2}$ ounce of saltpetre in the drinking water, four times a day; the patient will generally drink it readily, as his thirst is great, if not, give it in a bottle of water by the mouth and continue its administration until the fever abates; allow him as much water as he likes to drink. If he does not urinate when lying down he must be made to get up morning and evening, unless, of course, some one able to draw off the urine with a catheter is available.

As soon as the acute pain is relieved, and the animal is able to move about, his shoes should be lightly tacked on, and he should be given a little exercise on some soft place. If it is in a town where such an article can be properly made, a rocking bar shoe, as first recommended by Mr. Broad, of Bath,—that is, a bar shoe made very thin at the heel, and about twice the thickness of an ordinary shoe from the quarters to the toe, and seated or bevelled cut on the inside,—should be put on. It is surprising how much easier the horse will walk on such a shoe. If the heels stand up above the frog, lower them as much as possible. If matter forms under the sole, it must be let out, but the sole generally must not be thinned, nor the laminae laid bare. After the matter has escaped, dress with tar tow, fixed in with thin splints of wood, fastened under the inner edges of the shoe, after which a smart cantharides blister should be rubbed in all round the coronets. If the coffin, or foot bone, descends, and breaks through the horny sole, a seated shoe, thin at the heels, but of sufficient thickness around the quarters and toe to protect the sole, should be put on, tar dressings applied, and pressed down by splints of wood or pieces of hoop-iron. The blister round the coronets should be repeated; this will allay the inflammation and stimulate the growth of healthy horn. A run on a soft paddock for a few months after will be of much benefit.

If any permanent convexity of the sole remains, such a horse requires to be carefully shod with a thick seated shoe, low at the heels, and if the sole is tender, put on a leather sole. A foot with chronic laminitis is always liable to assume an acute form under any exciting cause.

Preventive measures.—(1) Long journeys should not be undertaken with a horse that is fat and not in training condition, unless sufficient intervals of rest be given. (2) Avoid washing a heated and exhausted horse with cold water, or giving a horse a dose of aloes, or any active purgative, when he is suffering from any catarrhal condition of the mucous membranes. (3) Avoid giving a horse a large feed of any grain which he has not been accustomed to, especially wheat, and do not persist in driving a horse after he commences to purge.

SEEDY TOE.

The term "seedy toe" is applied to a peculiar degenerative change which takes place in the character of the horn secreted by the sensitive laminae round the lower margin of the pedal bone, the result, evidently, of some diseased action which is induced in the secreting laminae. It first appears as a rim of dry, cheesy looking horn, between the outer wall and the sensitive part of the foot, extending perhaps only a short way round when first observed, but it very soon spreads, until it involves a considerable portion of the foot. It has no tendency to develop into healthy horn, but degenerates and crumbles away, leaving a hollow space between the outer wall and the pedal bone, with apparent loss of function of the secreting laminae of the parts affected.

Causes.—The condition may follow laminitis, or it may result from thinning the sole too much, and allowing the walls to be spread out. Seedy toe is often seen in high actioned horses, and most probably arises from sub-acute, or chronic inflammation being set up in the secreting laminae of the foot. It acts very much, however, as if it had a tendency to spread when once established, at any rate that possibility should be considered in the treatment.

Treatment.—Pare out the diseased horn clean, do not leave a vestige of it, if possible; search for it carefully all round with a fine drawing knife, and clear it out completely; then pour some hot tar into the cavity, fix it there by means of some teased tow; put over all a leather sole, and fit on the shoe nice and level. Repeat this at every shoeing. If the diseased action can be arrested, the secreting laminae will gradually be restored, and the horse regain a healthy foot: In very bad cases, occurring in valuable animals, I have removed the separated wall completely from nearly half of the foot, carefully cleaned away all diseased products, tacked on a bar shoe, kept the exposed side of the foot constantly covered over with hoof ointment and a bandage, and repeatedly applied blisters to the coronet. In six months' time healthy horn had grown down over the parts.

SAND CRACK.

This is a crack or fissure in any part of the horse's hoof; it is generally defined as a solution of continuity of the horny wall, in a direction parallel with the fibres of the horn. When a sand crack occurs in a fore foot, it is generally in the quarters, most frequently in the inside quarter; when it occurs in a hind foot, it is invariably at the toe, or centre of the foot in front.

Causes.—Thin, brittle hoofs, due to a defective or unhealthy secretion of horn. In the fore feet, sand cracks are generally associated with weak, thin quarters; in the hind feet, they are generally caused by severe strain such as starting a heavy load, &c. The horn of a horse's hoofs becomes brittle from being alternately wet and dry; moisture softens the hoof, but renders it spongy and porous, unless some covering, in the shape of hoof ointment is put on the feet after being moistened, if this be not done, not only does the artificial moisture evaporate, but the natural moisture also. The practice of rasping the walls, and paring out the soles tends also to make the horse's hoofs weak and brittle.

Symptoms.—In some rare instances, as Williams says, lameness may be present before the appearance of the crack, this is very seldom, however, but lameness very often appears before the crack is observed, unless where horses are carefully attended to, hence it is one of the accidents that should be looked for, when a horse appears lame. The crack generally commences at the coronet, and extends downwards towards the toe. Further, it may be merely a fissure through the horny fibres at first, but it very soon extends through the horny laminae, splitting the horny wall completely from coronet to sole, and causing the crack to open and shut each time the horse's hoof is raised up and put down. During this opening and closing of the crack, the sensitive laminae underneath are liable to be pinched, occasioning great pain and lameness. Dirt and sand are also liable to get into the crack, causing acute inflammation, and the formation of matter.

Treatment.—The first thing is to clean out the crack, and remove carefully all sand and dirt which may have gained access to it. If the crack is in the toe of a hind foot, get a shoe made with two toe-clips, one on each side of the crack, and fit the shoe in such a manner, by reducing the wall of the hoof, that the toe does not rest on the shoe underneath the crack. If the crack is in the inside quarter of a fore foot, put a bar shoe on, removing the bearing off the foot immediately under the crack in the same manner. If it can be done satisfactorily, put a clip on the bar shoe, to clasp the hoof immediately behind the crack, at any rate, in all cases remove the bearing from under the crack. If there is acute pain and lameness, place the foot for some hours in hot water, and see that no dirt or matter is left in the crack; it may be necessary to pare out the edges of the crack to do this. After keeping the foot as long as possible in hot water, place it in a hot poultice, and keep up the poulticing until the pain and lameness have ceased. After that is accomplished, the next consideration is how to arrest the further continuation of the crack from the coronet; the crack will not unite, and unless it be stopped at the top, it will continue a crack. There are various methods adopted for doing this, the common one in the Colony is to fire a straight line across the crack at the top, but unless the crack is completely obliterated at the coronet, this plan does not succeed. A very simple plan is to cut out a V shaped piece of horn at the top of the crack. With a fine pointed drawing knife, make two grooves like the letter V, the apex of the triangle is in the crack, about $1\frac{1}{2}$ inch from the top, while each limb is about $\frac{3}{4}$ of an inch on each side of the crack at the coronet. After having cut out this triangular groove with the knife, cut out the whole of the horn within the triangle, removing every appearance of the crack, from the coronet down to the apex. This will necessitate the careful paring off of the whole of the horn down to the quick, but do not make it bleed, if possible. Then heat a firing iron, and with it fire the edges of the V, especially at the apex, where you must completely separate between the open crack below, and the part which is cut out

above. Care must be exercised not to go too deeply and thus pierce the sensitive laminae, it is better to repeat the operation a week later, rather than go too deep at first, still, go as deep as possible, as a complete separation has to be made, or the crack will extend up again. After having done that, rub some cantharides blister on to the coronet, to stimulate the growth of healthy horn, and give the horse a rest for a week or two. Make sure afterwards that the horn is growing down whole from the coronet, and that there is complete separation between the crack, and the triangular part which is cut out. I have never failed in completely curing a crack by this method, and I have never stripped off the horn completely, as is recommended in many books.

If a crack is noticed in time, before it has extended far down the wall, or deep through the horny laminae, all that may be necessary is to draw the firing iron right across the crack about a quarter of an inch from the coronet, and then cut the horn completely out immediately above it. No crack should be left above the groove made by the firing iron, the horn must grow down whole from the coronet.

Nailing and clasping the cracks are successfully done, but these operations require some skill, and those who can perform them require no advice from me.

FALSE QUARTER.

This is really a defective or imperfect secretion of horn at a certain part of the coronet, most frequently at one or other of the quarters, hence its name.

Causes.—It arises from treads and similar injuries that destroy the coronary band which secretes the horn, hence there is defective secretion proportionate to the amount of injury, and very imperfect horn formed at the part.

Treatment.—The disease is generally of a chronic nature, hence, nothing but palliative measures can be adopted, such as putting on a bar shoe, taking the bearing off the quarter, and trying to induce a healthy action in the coronary substance, by slightly stimulating emollient dressings, or a blister.

CORNS.

A corn is a bruise of that part of the sensitive sole situated in the triangular space between the bar and the wall at the heel. Corns occur in the fore feet only, and most frequently in the inside heel. A simple corn is a bruise with extravasation of blood into the horny substance, but if the pressure be continued, inflammation, suppuration, and disease of the bone at the heel may result. When matter forms, unless it is allowed to escape from below, it will burrow up to the coronet, and may result in disease of the bone, and the formation of a fistulous sore.

Corns are the most common cause of lameness in the fore feet of horses in this Colony; it is quite a common thing to find them in both heels, and in both fore feet. Bad shoeing, and leaving the shoes on too long, are the principal causes. Farriers pare out the sole, cut out the frogs, and open the heels, as they call it, things which they should not do, but it is comparatively rare

that they level down the heel of the foot sufficiently. The heels should be levelled, in healthy feet, until the junction of the bar and the wall can be seen at the point of the heel.

Treatment.—If the corn be only a simple bruise, of recent origin, and it has not commenced to suppurate, all that is ordinarily required is to lower the heel with the rasp, and see that when the shoe is properly fitted, it does not touch the bruised heel. With careful shoeing in this manner, and not allowing the shoes to remain on too long, the corn or bruise will soon grow out. It is better not to cut out the bruised tissue, so long as it does not come near the shoe. But when there is suppuration, a “festered corn,” as it is termed, in addition to rasping down the heel, the bruised tissue must be carefully cut out, in order to allow a free escape for the matter, and prevent it from burrowing upwards; then keep the foot in a hot poultice, until the sore is cleaned, and the pain removed. It may be necessary in such a case, to put a bar shoe on to remove all pressure from the injured heel, and if much of the heel has become diseased and exposed, a leather sole with tar dressing, may be required as well.

If the bone has become diseased, it is necessary to cut away the whole of the diseased structures right down to the bone, and remove any caried or dead portions of bone also, before healthy action can be re-established. Such an operation however can only be satisfactorily performed by the expert surgeon.

Corns are purely the result of bad shoeing and neglect.

The symptoms of corns are very similar to those of navicular disease, a tendency to point the foot, and elevate the heel when standing. When moving, the horse goes tender, with a short, stilty, stumbling action. Instruct an assistant to hold up the opposite leg, then take a hammer and tap all round the lame foot, the horse will yield, and almost drop when you tap the inside heel, or seat of corn. *In all cases of hidden lameness, it is advisable to take the shoe off and examine the foot.* In many cases, where the heels have been allowed to grow very strong and high, I have seen a shoeing smith fail to find any appearance of a corn, although one was present, because the bruised tissue was so deep under the over-grown horn; hence the necessity for rasping the heels well down.

BRUISED SOLE.

This is similar to a corn, and is caused by bruises to the sole by stones, clay or mud being allowed to harden in the sole, and injuries by any rough or sharp objects.

Treatment.—Clean out any injured or bruised part, poultice until inflammation is subdued, and shoe with a leather sole, with tar dressing.

Pricks, or binding with the nails in shoeing. When a nail is driven into the sensitive laminæ, lameness follows immediately, but in cases in which the nails are driven very close although not actually into laminæ, causing pressure only, lameness may not appear until some days after.

Treatment.—Clean out the nail hole, allow any matter present to escape, poultice, and dress with a little tar, or if severe, put on a leather sole, with tar dressings.

Horny tumour. Cases of horny tumour, found at the toe generally, are sometimes met with; I think the clips have a good deal to do with the origination of these, just as constant pressure produces corns in the human subject. These horny tumours may press upon the sensitive laminae and the foot bone to such an extent as to cause absorption of the latter.

Treatment.—They must be carefully pared out. If the horny tumour extends some distance up between the wall and the vascular structures, the horny wall may require to be cut out for a short distance, in order to allow of the whole of the tumour being removed.

THRUSH.

“Is a discharge of a foetid material from the frog, arising from a diseased condition of the secretory surface of the fibro-fatty frog. The cleft is the part generally first affected and when neglected, the disease spreads over the whole organ; the horn becoming detached from the bulbs of the heels to the toe of the frog.”

Causes.—“These are *external* and *internal*. The external causes are excessive moisture and filth, standing in wet irritating manure, stuffing the feet with cow dung, or any injury to the frog. These causes operate by destroying the integrity of the horny frog, and irritating the sensitive secreting surface above or within it.” (Williams.)

The intrinsic causes are extension of disease from the heels, as in grease, and chronic inflammation of the fatty frog; thrush occurs also in contracted feet and atrophied horny frogs, and in feet which have suffered mutilation of the frogs by the knife.

Thrush from undue moisture and filth is most common in the hind feet, for obvious reasons; whilst thrush from internal causes, inducing disease of the fatty frog, is most common in the fore feet. Thrush in the hind feet, even when bad, rarely produces lameness, but lameness is very often associated with thrush in the fore feet, not, perhaps, so much from the thrush itself, as the chronic diseased condition of the foot which gives rise to the thrush.

Treatment.—If there is tenderness and lameness, put the foot in a warm bran poultice. (Holcombe recommends boiled turnips). Clean out the frog, cut away any loose horn, and dry the cleft of the frog by drawing a piece of cloth through it several times; then with a blunt pointed knife insert about 20 grains of calomel into the cleft, pressing it well down to the bottom by a small piece of flannel, or teased tow, which should be carefully fixed into the cleft above the calomel. If the secretion is confined to the cleft, nothing further is required, except to cover it up with a little tar, and to keep the feet dry. Renew the dressing in three days in the same manner; it is rare that more than three dressings are required. If the grooves on each side of the frog are affected, apply the dressing in the same manner to them. If the

whole surface of the frog is affected, remove all the separated horn, but be careful not to injure the sensitive fatty frog; dress the cleft and grooves with calomel, as directed, and dust some of it over the whole diseased surface of the frog, place some teased tow, or pieces of soft, dry cloth over it, then some tar over these, and fix the whole down with small splints of wood, or pieces of hoop iron, fixed across under the inner edges of the shoe; or put on a leather sole. But unless the leather sole is fixed so that it can be taken out and put in again, it interferes with the dressing of the foot, which must be repeated every three days at least, in bad cases. For the surface of the frog, a mixture of finely powdered bluestone and tar makes a very good dressing, but I do not know of anything superior to calomel, when properly and freely applied.

CANKER.

This is a very refractory disease of the vascular secreting surface of the frog and sole of the horse's foot, due in all probability to the growth and multiplication of a specific organism, similar to that which is the originating cause of grease. It usually commences in the frog, but rapidly extends over the sole, until it involves the whole plantar surface, and may extend up the laminae between the foot and the horny wall.

Canker is very liable to follow cases of neglected thrush, greasy heels, or any injury to the frog or sole by which the vascular tissues are inflamed or exposed.

Symptoms.—"A rapid growth, from the frog or sole or both, of a soft, unhealthy, spongy horn, the tubes of which are unnaturally large, open, and wanting in cohesion, so that they often stand apart from each other, and have the appearance rather of a fleshy material than of horn. If cut down, it may grow up to the same level in 24 hours, and the enlarged villi are reached and bleed long before this would have happened in a healthy horn. As in thrush, there is a most offensive discharge." (Law.)

Fortunately, in this dry climate, canker is not very common. I have only met with it in connection with grease, in fact, as an extension of that disease, and it has been much more amenable to treatment than the cases which I have met with in England, due to our drier climate, perhaps.

Treatment.—This consists in the careful and complete removal of all diseased parts from the frog, sole, and even from the wall, if the disease has extended round the borders of the sole and between it and the wall. Every particle of horn on the sole that is not perfectly sound must be cut away, and see that there is no corner left about the heels or grooves where any diseased horn is present. Many recommend that the whole sole should be removed or stripped off at once,—the healthy parts and the diseased alike, but few amateurs would attempt that operation, and I do not recommend it, but not a vestige of diseased or unsound horn must be left anywhere. After removing all loose and unsound horn, clean the diseased sole well with a clean, dry cloth, or pieces of tow; do not be sparing with the pieces of cloth, clean and dry the sole well, after which, tack on the shoe lightly, and

then burn down the fungoid growth with pure carbolic acid. Wrap a piece of cloth round the end of a small stick, and with this dress every corner of the whole sole with the acid, then roll up pieces of teased tow and pack these into the sole firm and hard, and press it down by little wood splints, placed across, and fixed under the inner edges of the shoe. Small pieces of hoop iron cut out the proper size answer best, as they fit in firmer. Renew the dressing every day. If the carbolic acid does not reduce the fungus, try a dressing of pure nitric acid, carefully applied all over the fungoid growth, let the sole dry for a little after the dressing, then apply some tar, and fix up as before. There are many other remedies used, and it is often of advantage to change them occasionally, they are:—Butter of antimony, chromic acid, chloride of zinc, quick lime, burnt alum, blue stone, &c. After one or two good dressings with a strong caustic, such as carbolic or nitric acid, I have had most success by dressing with calomel. I carefully pared off all diseased horn, dried and cleaned the sole well, and then applied calomel freely all over the exposed sole, using it as thick as I could get the powder to lie, and fixed the sole up with dry tow, as above, keeping the foot thoroughly dry, and renewing the dressing daily. Canker cases are very tedious and obstinate even under the best management, and any one who will not take the trouble to carefully dress such cases daily, with the utmost care, had better leave them alone.

QUITTOR.

This is a fistulous wound on the coronet or top of the hoof, at the quarters and heels.

Causes.—Treads or bruises on the coronet, suppurating corns, pricks from shoeing,—the matter burrowing up between the wall and the hoof and breaking out at the coronet. Fortunately quittor is comparatively rare in this Colony, due to the fact that horses are rarely shod with calkins, hence severe treads are not so common, and further, because treads or severe wounds, when they do occur, are not so liable to take on unhealthy action accompanied with large sloughing sores, as they are in countries in which the streets are covered with snow and melting ice for several months of the year.

Symptoms.—An established quittor is easily recognised, it consists of a painful swelling on the coronet, about the centre of which are seen the openings of one or more tubes or sinuses, from which either a thin clear fluid, or a thick, sometimes bloody looking matter, is discharged, accompanied with more or less lameness. But lameness very often precedes the discharge in cases which arise from a suppurating corn, or when a severe injury has been inflicted on the coronet. In such cases, a painful swelling appears, which fluctuates more or less on pressure, after which it either opens and the matter escapes, or a core or slough comes out, leaving an unhealthy wound.

Treatment.—Remove the shoe, and carefully examine the sole and heels in order to ascertain whether it arises from a festered corn, a prick in shoeing, or from a picked up nail having entered about the frog, or the grooves on each side of it.

If the discharge is due to a festered corn, the wall at the heel must be lowered and the horn within the angle of the heel carefully pared out, so that a free opening is made for the matter to escape. Similar treatment should be adopted when the injury arises from a prick in shoeing, or from picking up a nail; the wound should be opened well, taking care not to injure the sensitive sole, after which the foot is to be placed in hot water as long as possible and then kept in hot poultices until the pain and inflammation has subsided. It is advisable to add an antiseptic to the hot water or poultice, such, for example, as a little carbolic acid or Jeyes' fluid. A bar shoe should then be put on, to relieve the injured part from pressure, and dressings of tar and tow applied and held in position by small splints of wood or a calico bandage.

If the horn at the top of the hoof is separated from the coronary band, the whole of the separated horn should be carefully pared away, as it will not re-unite; a dressing of tar should be put on the exposed surface, and a blister rubbed into the coronet to stimulate the growth of new horn from the top.

When the quittor arises from a severe bruise or similar injury to the coronet, accompanied by acute pain and lameness, there is great danger that the severe inflammation produced may result in the sloughing out of a considerable portion of the tissues of the coronet, leaving a very nasty ulcerating sore. In all such cases the inflammation should be allayed as quickly as possible, and this is best done, in the early stages by the constant and continuous application of cold water, either by placing the foot in a tub of cold water, which is frequently renewed, or by pouring a stream of cold water continuously over the part, either by means of a hose pipe, a watering can, or a jug. Twenty-four hours' continuous application of cold water may save a large slough or even an open joint.

If matter forms, or the slough begins to separate, hot water, or hot poultices, should then be resorted to, to hasten the process of separation as much as possible, and relieve the pain which is generally intense. Thin the horn of the wall immediately underneath the swelling with a rasp, and when the abscess bursts, or the slough comes away, clean out the wound thoroughly with warm water; then take a pledget of tow or a piece of flannel or similar substance, soak it in a solution of carbolic acid and water, (one in twenty), fold it up so that it fills the wound and covers its edges, and fasten it on by a strong calico bandage, applying even pressure to the parts, to stimulate the formation of healthy granulations in the wound, and to prevent the formation of sinuses. Renew the dressings daily and keep the animal at rest.

When pipes or sinuses have formed, either before treatment has been attempted, or during its progress, these must be destroyed before healthy action can be established. The depth and direction of these sinuses can be ascertained by carefully inserting a probe, or an ordinary *blunt* knitting needle. Various plans are adopted for the destruction of these sinuses, and mixtures of different characters and strengths are used. Some take 5 grains

of finely powdered perchloride of mercury, roll it up neatly in a small piece of tissue paper, twisting one end into a fine point to fit it for insertion into the sinus, and pressing it well down. This causes the destruction of the tissues, which slough out as a core. If the sinus is bottomed by this means, dress the wound, and tie it up as already directed, but if there are still some sinuses left after the core comes out, a second plug should be inserted into each of them also, *unless the sinus take a direction inwards towards the joint*, when it is dangerous to cause a slough, lest open joint follows.

Another plan, and I think a preferable one, is to inject a solution of perchloride of mercury into these sinuses with a small glass syringe. Various strengths are used. The following may be tried:—

Perchloride of mercury	40 grains.
Spirits of wine	1 ounce.
Hydrochloric acid	10 drops.

Mix and inject this well into the sinuses twice a day for three or four days, or until the discharge ceases. Thin the horn under the wound, and apply pressure to the parts by means of a bandage, while this treatment is being pursued.

In quittors of long standing, ulceration and sloughing of portions of the lateral cartilage are a very frequent result; an operation then becomes necessary, but for this the services of an expert surgeon would be required consequently it is unnecessary to enter into details regarding the technique of the operation.

CONTRACTION OF THE FEET.

This is not a cause but an effect of disease, or the result of bad treatment. Atrophy or wasting of the soft vascular structures of the foot occurs as an accompaniment of certain diseases of the foot, but it also occurs from loss of function, resulting from the mutilation of the foot by the drawing knife.

Causes.—The principal causes of contraction of the feet are cutting away the frogs and preventing them from performing their natural function of bearing weight and distributing concussion; “opening the heels,” that is cutting away the parts connecting the back part of the frog with the wall at the heels, thereby removing the principal support for keeping the heels open; paring out the sole, and rasping the wall, which opens the horny fibres, and permits the natural moisture of the foot to evaporate; and allowing the heels to grow too high, while the sole and bars are cut away, this tends to cause the unsupported horn of the heels to bend inwards.

Treatment.—The simplest treatment is to lower the heels with a rasp, and shoe the horse with tips; the heels will then get proper wear, while the frogs will gradually improve, as they approach the ground, and get functional exercise. Or, if the horse can be spared, leave the shoes off, rasp down the heels as low as possible, and turn him into a soft paddock. A healthy foot, when neither shod nor interfered with, generally keeps itself in repair.

STOPPING HORSES' FEET.

The object of stuffing a horse's hoofs with a mixture of cow dung and clay, or cow dung, vinegar and salt, formerly so frequently practised, was to keep them cool, moist, and soft; but if a horse's frogs are untouched with the knife and allowed to expand to their natural size, and the sole is not hollowed out, but left with its natural covering, there is no room for stopping neither is there any use for it. In fact the constant stopping of the feet with cow dung and other such abominations is a common cause of thrush.

If the walls of the hoof are not rasped, and the soles not pared, the hoof will retain its natural moisture, except during a long continuance of wet weather, when the constant moisture softens the horn, opens its fibres, and washes out the natural agglutinating material which binds them together, with the result that the natural moisture of the horn evaporates with the artificial, when the foot dries. In wet weather, therefore, after washing the horse's feet after coming in from work, it is advisable to apply an ointment to the wall and soles of his feet as soon as they are dry. There are many such ointments, but the black ointment which may be obtained from chemists answers very well. The following mixture is also recommended for stuffing the feet: equal parts of soft soap, stockholm tar, and linseed meal.

APPENDIX.

WEIGHTS AND MEASURES.

FLUID MEASURE.

1 fluid dram	=	60 minims.
8 fluid drams	=	1 fluid ounce.
20 fluid ounces	=	1 fluid pint.
2 pints	=	1 quart.
4 quarts	=	1 gallon.

WEIGHTS.

60 grains	=	1 dram.
437½ grains	=	1 ounce.
7,000 grains or 16 ounces	} =	1 pound.

The doses of medicines to be given in proportion to age are:—

From 3 years and upwards	Full dose.
„ 1½ to 3 years	½ dose.
„ 9 to 18 months	¼ dose.
„ 4½ to 9 months	⅓ dose.
„ 1 to 4½ months	⅙ dose.

THE MEASUREMENT OF DRUGS, ETC., BY MEANS OF DOMESTIC UTENSILS.

Although this is often a convenient method of measurement, it must be noted that owing to variation in size of ordinary domestic utensils the following are only approximately correct:—

A so called quart wine or whisky bottle	holds	27 fluid ounces.
A "pint" wine or whisky bottle	holds	13 fluid ounces.
Common Tumblers	hold	8 to 10 fluid ounces.
Teacups	„ 5 to 7 „ „	
Breakfast-cups	„ 8 to 10 „ „	
Wineglasses	„ 2 to 2½ „ „	
Tablespoons	„ 4 to 6 fluid drachms.	
Dessertspoons	„ 2 to 3 „ „	
Teaspoons	„ 1 to 1½ „ „	
1 minim is approximately equal to 1 drop.		

COINS AS WEIGHTS.

A threepenny piece	weighs	20 grains (one scruple).
A sixpence	„	40 grains (two scruples)
A shilling	„	80 grains.
Three penny pieces and a threepenny piece weigh 1 ounce.		
3½ Sovereigns weigh one ounce.		

These again are only approximately correct. When it is desired to weigh quantities of active poisons such as arsenic, coins hardly form sufficiently accurate measurements of weight.

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