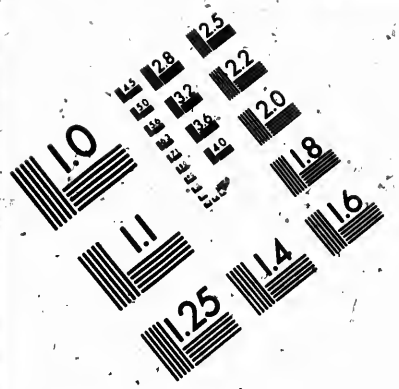

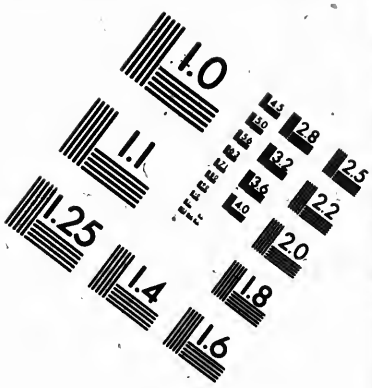

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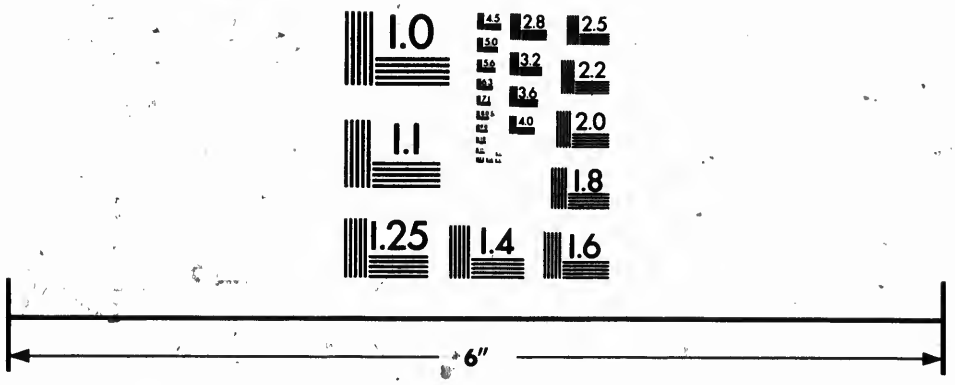

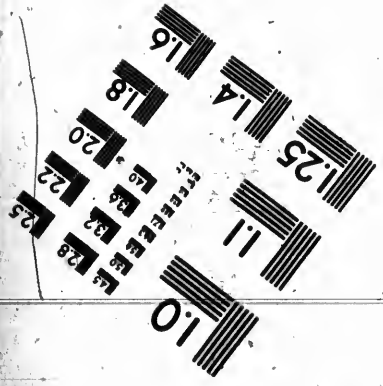

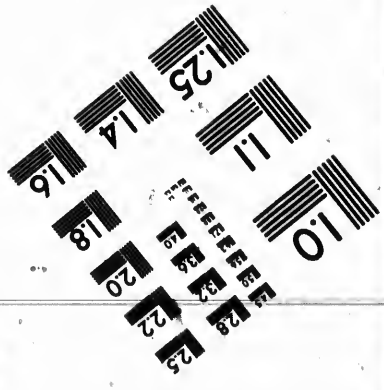

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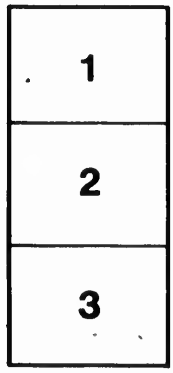

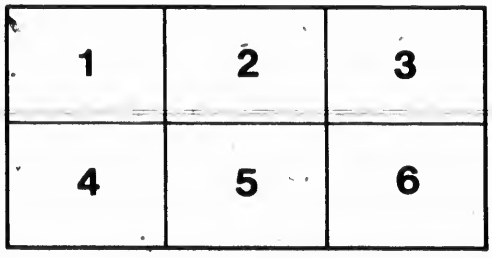

EVERY MAN
HIS OWN
HORSE AND CATTLE DOCTOR.

MAUD S.—2.08¾.

THE QUEEN OF THE TROTTING TURF.

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EVERY MAN

HIS OWN

HORSE AND CATTLE DOCTOR.

COMPILED FROM THE WORKS OF THE MOST CELEBRATED EUROPEAN, AMERICAN, AND CANADIAN VETERINARY AUTHORITIES,

BY

E. KING DODDS,

Editor of "The Canadian Sportsman and Live Stock Journal,"
[ESTABLISHED 1870],

ASSISTED BY SEVERAL EMINENT "VETS."

ALSO

HOW TO DEVELOP SPEED IN HORSES, AND HOW BEST TO BREAK AND TAME THEM.

A FEW INTERESTING CHAPTERS ARE ALSO DEVOTED TO THE BREAKING AND TRAINING OF COLTS.

THE WHOLE BOOK SUPERBLY ILLUSTRATED.

Toronto:
PRINTED BY THE CANADIAN SPORTSMAN AND LIVE STOCK JOURNAL PRINTING AND PUBLISHING COMPANY.
1886.

EVERY MAN

HIS OWN

HORSE AND CATTLE DOCTOR.

PREFACE.

Of late years there has been an enormous increase both in the quantity and quality of the horse and cattle stock of Canada. Farmers are becoming actively alive to the advantages derived from breeding a higher class, and are fast becoming believers in the stubborn fact that it costs no more to raise a good colt or calf than it does to feed a mongrel brute which at maturity possesses but little market value.

Farmers who raise stock have great interests at stake, and it behoves them to use every precaution to guard against the ravages of disease. Yet, even a more important question comes to the front, viz., how can disease best be cured when it does come? If every farmer had a highly educated Veterinary practitioner living in his immediate neighborhood, and the said farmer was willing to stand the expense, such a question could be easily answered. But the majority of stock owners are so situated that they are unable to obtain the services of a "Vet" at a few minute's notice, and a very brief delay often means death to the sufferer.

Now the object sought to be accomplished in the publication of this book,

is to supply a mass of valuable information gathered from the most eminent European, American and Canadian Authorities, and so present the result of their combined wisdom, that the plainest minded man may easily understand it.

This work is for the use of practical men, nine-tenths of whom do not understand Latin or scientific terms, therefore plain English alone is used, and the reader will find that while every ailment and disease known to exist amongst horses, cattle, sheep and swine has been exhaustively dealt with in these pages, and *recipes* included, showing how to cure them, they have been so plainly and practically treated that none can fail to understand. The old saying that a "stitch in time saves nine" is particularly appropriate in connection with the management of stock. What was but a slight attack easily cured if intelligently dealt with at the commencement, either through neglect or delay in waiting the arrival of a "Vet," becomes incurable, and a valuable life is lost.

The old practise of blood letting and heavy physicking is fast giving way to a more rational system. In curing disease, medicine and the Veterinary Art should be so employed as to *assist* the powers of nature to overcome the complaint—nothing more.

The remedies recommended in this book are in no way speculative; they are the tried formulas of men eminent in their profession, and which, through years of practice, have proven themselves the best. The statement is often made by unthinking writers, that if farmers would take good care of their live stock, there would be no trouble from disease. Now, while we are strong advocates of, and thorough believers in the importance of good care and of the proper observance of hygienic conditions for our domestic animals, it is absurd to argue that even the best of care and the most scrupulous attention to the comfort of his stock necessarily gives the farmer immunity from contagious diseases. Fortunately the country has been for some years quite free from any extended epidemic; but it would not be difficult to find more than one section of country where amongst horses influenza has been more than usually prevalent. Wise attention to the laws of health is all important on the part of the human family; the chances of continued good health are greatly enhanced by such wise precautions, but when the dreaded cholera or small pox makes its appearance, even the best and cleanliest homes may be afflicted, though their chances of escape are as a hundred to one over the unclean habitation.

In addition to the treatment and cure of the ailments and diseases of cattle, sheep and swine, we have included an exhaustive treatise on the horse's foot and how best to manage so as to keep it sound. We have also devoted considerable space to the training of young horses so as to develop their speed; and many a lad on the farm, who intelligently applies his spare time at the proper season to develop latent speed in a colt, will find, if he be

successful in his effort, that he has added a very liberal amount to the animal's market value. It is an admitted fact that the possession of trotting speed greatly adds to a young horse's value: two four year olds may be offered for sale, perfectly mated in size, color and action, yet if one of them can trot a mile in three minutes, and the other one is unable to go the trip in less than five minutes, every boy knows that the faster horse will command a much higher price than his slower mate. Now, it often happens that a farmer sells a young horse at an ordinary price, which, if he had taken the little trouble necessary to properly develop the latent speed in him, would have realized three dollars for the one he was sold for. This is a hard, stubborn fact worthy of remembrance. The system of taming, also introduced, is founded on the Rarey plan, and there is so much sound wisdom in it that it will do do any horse owner good to carefully study the simple rules laid down for the proper discipline of man's noblest helper.

GENERAL TREATMENT OF THE HORSE

Warm the bit in frosty weather, before putting it into the horse's mouth

Let the horse occasionally lick a little salt from your hands when you offer the bit.

Never startle a horse by striking him suddenly or unexpectedly.

Gentle treatment as a rule will secure faithful and steady work. Anger, severity, and sudden jerking, endanger your harness, your vehicle, and your life, besides permanently injuring your horse, thus destroying your own property.

Be well provided with blankets, particularly at night. If you are waiting for passengers, while you look out for your own comfort by a warm fireside, or in thick wrappers, see that your horse is also protected from the chilly air.

Wash the inside of the collar frequently with castile soap suds, and when it has thoroughly dried, gently warm the leather and soak it with oil, so as to soften it. Do not allow any oil to remain unabsorbed on the surface of the leather.

If the shoulders are tender, feverish, and disposed to chafe, they should be well rubbed, and afterwards washed with salt water. This should be done after unharnessing, so that the parts bathed may be dry before work is resumed.

Never be tempted to overload your team. Overloading occasions blindness, spavin, splint, and other painful and fatal disorders.

See that the harness fits easily in every part, and that the shoes are tight and well put on. If there are chains connected with any part of the harness, let them be well covered with soft leather or sheepskin.

In addressing the horse, be always gentle and soothing, yet firm. Pat him frequently, and encourage every sign of attachment that he gives, but never let him forget that you are his master.

Every truck, or other vehicle, should have a prop stick hung to the shafts, to relieve the burden of the load whenever the team is standing.

This is a little attention too frequently neglected. Consider how you would like to rest yourself with a load bearing on you.

Curry, rub, and clean well and thoroughly, *at least*, once every day. The effect is worth half the feed. A dirty coat and skin, when the animal is deprived of exercise in pasture, and of rolling on the grass, cannot fail to produce disease.

Be moderate on the check rein. It is a false taste that thinks a horse more beautiful when his head is fastened in an unnatural position. The short bearing rein keeps a horse in a constant fret, makes him restless and uneasy, and often prevents him from recovering himself in case of a stumble or fall.

Your stable should be perfectly level, well lighted, well drained, well ventilated, and well protected from draughts, and from extremes of heat and cold. Keep the crib clean and free from dust, and keep the hay and other fodder as far from the stall as possible, so as to be away from the steam and breath of the animal.

Do not urge your beast to his best pace when the heat is oppressive; always endeavor to pull up in a shady place.

In very cold weather keep your animal sharp shod, renewing the sharpening as often as the shoes become blunt.

Standing on fermenting manure softens the hoof, produces thrush, and brings on lameness. Keep the litter dry and clean, and cleanse the stall thoroughly every morning. Remember cleanliness is next to godliness in beast as in man.

Sharp bits make the mouth tender at first, and afterwards callous, so that the horse becomes unmanageable.

If your horse kicks and plunges on mounting, look to the stuffing of your saddle, and see if it has become hard and knotty with use.

Keep your wheels well greased. This reduces the labor of drawing the load.

Keep the feet well brushed out, and examine every night to see if there is any stone or dirt between the hoof and the shoe. Change the shoes as often as your experience teaches you it is necessary.

Disease or wounds in the feet or legs speedily become dangerous if neglected.

When a horse is hot and fatigued from work, walk him about till cool; groom him quite dry, first with a wisp of straw, and then with a brush; rub his legs well with the hand, to remove any strain, soothe the animal, and detect thorns and splinters; and give him his grain as soon as he is cool, and dry, and willing to eat.

On the evening before a long journey give double feed; on the morning of starting give only half a feed of grain.

When horses are long out at work provide them with nose-bags and proper food. The nose-bag should be leather at bottom, and of basket work or open texture above.

Lead the horse carefully into and out of the stable. Accustom him to stand quite still till you are seated. Start at a walk, and go gently the first and the last mile.

Use the whip rarely and with judgment. It will, then, always be available as a last resource.

Be always on your guard, just feeling the mouth with the bit, lightly and steadily.

If a horse shies, neither whip him nor pat him, but speak encouragingly, and drive him slowly, with a firm hand, towards the object.

If you value your own life, the lives of others, or your horse, drive cautiously in the dark.

Get out and walk when you ascend a hill if the horse is at all burdened. If you stop on a hill, put a stone behind the wheel.

Never tease or tickle the horse.

Follow the rules here set forth, and the value of the horse will be materially enhanced.

THE PULSE, BREATHING, ETC.

THE PULSE. — The pulse of the horse is felt under the upper part of the jaw bone. The state of the pulse reveals the condition of the heart, telling us whether the disease is of an exalted or depressed character, or whether sickness is at all present. The pulse beats stronger in young than in old animals. In the full-grown and healthy horse it beats from thirty-two to thirty-eight in the minute; in the ox or cow, thirty-five to forty-two; in the sheep, seventy to seventy-five; and in the dog, from ninety to ninety-eight. In inflammations and fevers the frequency of the pulse is increased. In debility and depression it is slower, but sometimes quicker than natural. There are the quick pulse, the strong, the sharp, the regular, and many other varieties, which few persons can appreciate. The pulse of inflammation and fever numbers from seventy-five to eighty beats in the minute; so that close attention to its warning voice will learn us what to do.

BREATHING.—An ordinary strong, healthy horse will take one inspiration to three of the pulse beats. When the breathing is more frequent or slower, and when irregular, or difficult and laborious, it plainly indicates disease; although we sometimes see the breathing quickened and short, when no disease is present; for instance, the pulse and the breathing will be quickened by exposure to heat, as in a stable up stairs, or by exposure on a blazing hot day. By removing the animal to a stable well ventilated, the breathing and the pulse will be greatly lessened. Hence the advantage of placing animals in a cool and airy place when they are unwell. It saves a great waste of their strength and vitality, thereby greatly aiding them to throw off the effects of disease.

DISEASE.—The cause of disease amongst domestic animals is not so great a mystery as one might at first thought imagine. It is a fact well known to all intelligent breeders, that the quality of the sire is generally impressed upon the offspring, whether for good or bad; and as certain breeds of horses or strains of blood are noted for their stoutness and lasting qualities,

so others are equally noted for being deficient in those necessary qualifications.

In the history of the thoroughbred will be found families famous for possessing speed only for a short distance, and such a feature in a sire is generally transmitted to his offspring. Again, it is equally well known that other branches of the thoroughbreds are famous for their sticking qualities, and in the language of horsemen, "No road is too long for them."

Innumerable illustrations could be presented of particular families that are remarkable for good or bad points, for fine formed or big, coarse heads; for high and well developed, or for low and weak withers; for strong, flat, and well boned, or for spindly weak and ill-formed limbs, particularly in the case of the horse certain shaped limbs are notoriously liable to certain diseases. Thus it is that bone spavins are much oftener met with where there is a disproportion in the size of the limb above and below the hock. Strains of the tendons of the fore-leg where the limb is round and the tendons and ligaments unduly confined at the knee; and navicular disease where the chest is narrow and the toes turned out.

The common disease known as bone spavin is inherent or dependent upon pre-disposition, for you rarely find a horse to be subject to this malady unless he has faulty hocks. The same remarks also apply to ring-bone. Either the pasterns are too light thereby causing too much jar and concussion, or they slant unnaturally and the consequence is a strain of the ligaments, ending often in ringbone and other bony diseases.

"Professor Dunn, of the Edinburgh Veterinary College, tells us that diarrhœa and colic are to a certain extent hereditary, "inasmuch as they are very prone to attack horses of particular form and constitution, as those with narrow loins, large flat sides, and of what is generally termed a washy appearance. If such animals be overworked (especially soon after being fed, if their food be suddenly changed, or if they be allowed an unusual quantity of fluid, they are almost certain to be attacked either by purging or colic. The tendency to these diseases appears in such cases to depend on a want of adjustment among the different organs of the body, a want of balance among the different functions of digestion, circulation and respiration."

Many farm horses, as well as others without much breeding, are remarkable for consuming large quantities of food, for soft and flabby muscular systems, and for round limbs, containing an unusual proportion of cellular tissue. These characters are notoriously hereditary, of which indubitable evidence is afforded by their existence in many different individuals of the same stock, and when long continued, even under the best management and most efficient systems of breeding. Such characters indicate proclivity to certain diseases, as swelled legs, weed and grease. If horses of this description stand long, the circulation of the blood through the limbs is retarded; for as the contraction of the muscles which materially aid circulation are

wanting, the blood in the veins rises with difficulty against its own gravity, while the soft and lax condition of the venous coats, and of the muscles in contact with them, permits the passage of the fluid parts of the blood giving rise to a serous effusion which is soft and pits on pressure. This condition, although troublesome and frequently happening, is easily remedied by friction, exercise, or a little physic, and does not unfit the animal from doing work.

The cause of many diseases, however, may be summed up as follows :— Debility, developed by bad management ; undue exposure, unwholesome food, plethora induced by over feeding, want of necessary exercise, over-taxing the muscular powers of the animal, and the breathing of an impure atmosphere. A great proportion of the diseases occurring among horses and cattle in Canada, is traceable to the fact that they are not properly cared for. Exposure to pitiless winds in the winter season and lack of sufficient nutritive food impoverishes the blood and predisposes the animal to sickness and disease.

Diseases of the Horse.

Abscess.—This is also called, by some persons, a beeling—a formation of matter or pus under the skin, as the result of inflammation, either acute or chronic. Sometimes abscess in bone is seen, also of the liver and the brain; and, indeed, no part or tissue of an animal is exempt from it.

Symptoms.—Pain, heat and swelling; a projection or prominence on the swelling from which the hair falls off, disclosing a yellow, white and soft part upon its apex. In a common abscess of this kind, it will only be necessary to hasten the formation of the pus by applying poultices of flax-seed or some other soft substance to the part, and when the point is soft and evidently contains fluid, make an opening on its lowest dependent point with a sharp knife, so that the discharge will flow out of itself, and then apply

Rain water	1 ounce.
Chloride of Zinc, ...	6 grains,

Mix and apply to the wound twice a day.

It is not advisable to open an abscess too soon, or before the pus has properly formed.

Accidents.—When a horse falls whilst drawing a vehicle—

1. Jump down and hold the animal's head, to prevent his dashing it about to his own injury.

2. Loosen the check-rein and the parts of the harness which fasten on the vehicle.

3. Back the carriage so as to get the shafts and traces clear.

4. Steady and support the horse's head, and excite him, with hand and voice, to rise.

5. When you have got him up, pat and encourage him, and see if he is wounded, or otherwise injured.

6. Let him stand still a short time to recover himself, and then proceed gently and with greater caution than before.

Alteratives.—This term is in very general use, and easily explains its own meaning. The object is to replace unhealthy action by a healthy one, without resorting to any of the distinctly-defined remedies, such as tonics, stomachics, etc. As a general rule, this class of remedies produce their effect by acting slowly but steadily on such organs as the liver, kidneys, and skin. The following may be found useful for general use :

Black sulphuret of antimony, .	2 to 4 drachms.
Sulphur, ...	2 drachms.
Nitre, ...	2 drachms.

To be given mixed in oat feed at night only.

Amaurosis.—Glass eye. (See Eye Diseases.)

Aphtha.—(See Mouth Diseases.)

Atrophy.—Wasting and shrinking of a part of the muscle, as is seen in *sweenie* of the shoulder ; and also palsy and paralysis of the hind legs, from which the muscles of the hip will be seen to have fallen away.

Causes.—The parts deprived of their proper use, action or function. A long-continued corn on the foot of a horse, depriving him of the proper use of that limb, will cause shrinking of the muscles of the shoulder.

Again, in the case of a horse that has been overworked, the result may be very similar to what it is in the case of a man who undertakes to saw wood or perform any other hard job that he is unaccustomed to, his muscles will be strained and he will afterwards feel very sore. Now the muscles of the horse being just as susceptible to pain as those of man, are just as easily affected, therefore through such overwork some of the muscular fibres in the region of the horse's shoulders may become strained or fractured, and this is followed by inflammation, and in the course of a few days it may be noticed that his shoulders are wasting away, so that those who examine the animal pronounce him sweenied.

Treatment.—In such a case the principal treatment is rest, afterwards lighten up on the work, and by proper feeding and tonics, increase the horse's ability to work. The affected parts should be bathed morning and night with a portion of the following :

Fluid extract of wormwood, . .	2 oz.
" " poppies, . .	2 oz.
Spirits, ...	1 pt.

Mix well together and rub a little, well in twice a day. Should the feet be hot and feverish, bathe frequently with cold water.

Baldness.—(See Skin Diseases.)

Belly-ache.—(See Colic.)

Big Head.—It is incurable.

Bishoping.—Bishoping is the name of an operation performed by sharpers on the teeth of a horse to make him appear younger.

Bite of Mad Dog.—Have the parts well washed out with cold water. This must be thoroughly done. If the bite be upon the leg of man, horse or other animal, or man's arm or finger, a *Tourniquet* or soft rope or cord should be tied tightly around the leg *above* the bite, till other measures are used to have the bite purified. After the cord is properly applied, have the parts washed out; next either cut a portion of the flesh from the top, sides and bottom of the wound, or apply caustic to the parts. The nitrate of silver is possibly the best for this purpose. A few drops of nitric, or sulphuric acid may be dropped into the wound, and by the burning properties of these articles the destructive character of the poison will be destroyed.

After these measures have been satisfactorily performed, the wounds should be treated as for common wounds with simple ointment. The bite of other rabid or poisonous animals should be treated in the same manner.

Bites from a healthy dog will never produce madness, even although the animal go mad in a year or two afterward, so keep your mind easy on that point.

Bladder Diseases.—INFLAMMATION.—Horses are not often troubled with this.

Causes.—Irritating substances or foreign bodies in the bladder.

Symptoms.—Constant desire to water, pain, straddling or walking wide with the hind legs, great tenderness under the belly.

Treatment.—Inject a little warm oil into the bladder. This can only be done by an expert with a proper instrument. Give 20 drops of the tincture of aconite root every 4 hours, till six doses are given, to keep down pain. Allow flaxseed tea to drink, or drench the horse with it, which has an excellent soothing effect. Give plenty of cold water to drink.

2. CALCULI.—This variety of stone is sometimes found in the bladder and kidneys of horses. This may be said to be the gravel of the horse, although not so common as in man, but it is equally troublesome. As an evidence of its presence in the horse, when urinating a full stream the flow will stop suddenly, the animal still straining, until it again commences. This is a pretty sure sign. To cure it demands a formidable operation called *Lithotomy*, an operation of no great magnitude to an expert surgeon, but can scarcely be undertaken by an unprofessional person, even though a description of it were given.

Bleeding.—1. An operation for the drawing of blood from the body, either locally or generally. As before stated, it is almost entirely discarded from domestic practice, and should never be used in the treatment of diseases of animals, however much the adherent of an exploded and an erroneous sys-

tem may doubt it. Medicines will be described in this book that will not only insure greater success in saving a very much greater percentage of sick animals, and with less trouble in a much shorter time, and without in any way impairing the sanative powers of the animal's constitution.

BLEEDING FROM WOUNDS.—If the wound be a simple one, and not on the inside of a leg where the large blood vessels are situated, all that will be necessary to stop it will be a small piece of cotton or soft cloth placed in and over the wound, and secure it for a few hours by a broad bandage, not too tightly applied over it, or, if preferred, touch the mouth of the bleeding vessel with a piece of iron previously immersed in boiling water or in the fire itself. The surgeon's plan would be to get hold of the mouth of the vein or artery with a pair of artery forceps or small tongs, to hold it so that he can tie a piece of saddler's silk around it.

BLEEDING FROM THE AIR PASSAGES AND LUNGS.—Observe the color of the blood discharged from the nose or mouth, as the veins of the lungs convey blood similar to the arterial blood of other parts of the body.

Causes.—The laying bare, and the rupture of small vessels, and the structure of the lungs, breaking down as in consumption, and some cases of glanders and coryza.

Treatment.—Support the strength by giving 60 drops of sulphuric acid mixed with half a bucket of cold water. In mixing it the acid is to be dropped into the water, not the water into the acid. Give also small doses of aconite to lessen arterial circulation. Bear in mind in cases where the structure of the lungs is falling to pieces, no power or art can arrest it,. Hence the incurability of consumption.

BLEEDING FROM THE SKIN.—This disease is sometimes called *purpura*.

Symptoms.—After general uneasiness, some pain, fever, and swelling of the legs and other parts of the body; tumors, varying from the size of a cranberry to that of a pigeon's egg, often running together, forming large patches from which blood is oozed out in quantities, giving rise to much debility. The contagious typhus or rinderpest of cattle, bears many resemblances to this disease of the horse.

Treatment.—Feed the animal on the best food that can be procured, and pour forty drops of commercial sulphuric acid in half a bucket of cold water three to four times in the day. Then get two ounces each of the sulphate of copper and gentian root in powder, and divide into eight powders, and give one night and morning in the feed.

Apply to the bleeding surfaces and sores, a liniment composed as follows: Olive oil three ounces; creosote one ounce; mix and use once in the twenty-four hours.

Bloody Urine.—(See Kidney Diseases.)

Blood.—Blood is of *two* colors, namely, red, or almost of a bright scarlet. When blood of this color is issuing from wounds in jets or jerks, it is considered more dangerous than if it were a dark-red, or venous blood. The first is direct from the heart itself, and the other is from a more remote and less dangerous part.

It may be interesting to know, that red globules are more plentiful in blooded or well-bred horses than in horses of a coarser kind, which accounts for a curious fact observed in the difference of vitality. Thus, a blooded horse often bears up under diseased action, and is cured, while a common horse will die under the same disease.

The fluid portion of blood is called *liquor sanguinis*, in which the red globules or spheres float. When blood is drawn from the body, it divides into two parts; the solid is called *clot*, and the other is the *serum*. This serum was once relied upon, and is still by the ignorant, as showing the existence of inflammation. It is by the blood that the strength, wear and tear of the system is kept up. The heart is the organ by which the blood is forced through the body.

Boils.—(See Saddle or Harness Galls.)

Bots.—(See Worms).

Bowels, Disease of.—(See Costiveness, Diarrhœa and Dysentery.)

INFLAMMATION OF THE BOWELS.—Symptoms.—Acute pain in the belly, and continuous, getting no intervals of rest from the pain. Rolling, pawing, and shifting about, sweating, and breathing fast, with great fever, exhaltation, and excitement. A fearful disease. Happily not so frequent as formerly.

Can only be mistaken for colic, (which see.) In colic there are times of ease from pain, but never in this disease.

Causes.—Exposure to cold, drinking cold water in great quantities when hot, calculi, or hair balls in the bowels, costiveness, diarrhœa, etc.

Treatment.—The first thing to be done is to lessen or destroy pain. Give a large dose of the tincture of aconite root, say twenty-five drops in water, to be repeated in two hours. Apply blankets wrung out of boiling water to the belly, and renew them in about twenty minutes.

Give injections of *warm* not *hot* water, soap, and a handful of table salt every half hour. Continue the treatment while there is enough strength remaining. Keep the animal warm and well clothed.

Bleeding will only insure and hasten death, and purgatives are too slow to act—the horse is either dead, or will be before any response can be had from them.

Breaking Down.—This accident means or consists in rupture of the tendons and ligaments, and occurs at once when the horse is at full speed.

Symptoms.—The horse stops suddenly, or perhaps stumbles and falls;

gets up, but stands on his fetlocks, the toe of the foot turned up, and the sole of the foot, as it were, looking at you.

Treatment.—If the fetlock comes entirely to the ground, not much can be done; and when it does not, contraction of the leg takes place, and requires division of the tendon.

Brittle Feet.—(See Foot Diseases.)

Bronchi.—This term means the windpipe, and communicates and carries the atmosphere to and from the lungs. It is the seat of disease, and is affected more or less in all cases of colds and inflammations, whether of the lungs or their membranes.

Bronchitis.—Inflammation of the Air Passages or the Parts Enumerated above.—This is a very common disease among horses, and is confounded by most horse doctors with inflammation of the lungs, distempers and colds; whereas, it is distinguished from inflammation of the lungs by its seat, and from the others by as great a similarity.

Bronchitis occurs in various degrees of intensity, and should at least be described under two heads, notwithstanding the one distinction may run, as it does sometimes, into the other.

Acute Bronchitis.—Symptoms.—Ushered in by a chill, fever, harsh or painful cough, loss of appetite, heaving at the flanks, mouth hot and dry. In a day or so, a discharge of pus or matter will be observed from one or both nostrils.

If bleeding, or other severe measures be used, the horse will assuredly die, not so much from the disease, but from maltreatment. Better, in a disease of this kind, let nature have her way, and give the horse a chance for his life; for in the other case, he has absolutely none whatever.

Treatment.—First, the horse should be treated as for fever. Place the horse in a comfortable, airy place, not drafty. Give him from ten to fifteen drops of the tincture of aconite root every four hours, till three doses are taken. This will relieve the fever, breathing, and the hot and dry mouth. Give plenty of *cold* water to drink. Let the animal have a little grass, if it can be got; this will relax the bowels, and cool the stomach. On the second day, the following medicines may be taken, that is, if they be necessary: Powdered gentian root, two ounces; powdered nux vomica, one ounce. Mix and divide into six powders, and give one powder morning, noon, and night. These medicines will prevent debility and depression, and the pouring out of fluid or serum into the legs, sheath, belly, and breast. After the fever has been removed, allow good feed, and a fair quantity of it. Such treatment will not only cure the horse in five or six days, but the horse is nothing the worse, beyond the loss of a few days' work.

Chronic Bronchitis.—Symptoms.—A confirmed cough, more or less

severe, and a discharge from the nose. The cough is worse in the morning, and after drinking water.

Causes.—Maltreatment of acute cases of bronchitis, and where the attack has been prolonged beyond a reasonable time, causing ulceration or thickening of the windpipe.

Treatment.—Give extract of belladonna, half drachm; powdered digitalis, half drachm, three times in the day, morning, noon, and night, for a few days. If no good seems to have been done, a different plan will have to be adopted, namely: feed the animal well, and give sulphate of iron, two drachms in powder; gentian root, two drachms in powder—twice in the day for two weeks. By this time the absorbant system will be pretty powerful. Then apply the following salve or ointment, well rubbed in down the course of the windpipe, once in the week. Lard, one ounce; red iodide of mercury, one drachm. Mix. This will cause whatever thickening may exist, to be absorbed or taken up. Lard or oil will have to be applied once per day on the place where the ointment was applied, to prevent the skin from cracking. If the animal be weak, give occasionally sixty drops of commercial sulphuric acid in half a bucket of cold water to drink.

Broken Knees.—When a horse stumbles and falls upon his knees, and takes the hair and some of the skin off, this is called broken knees.

Treatment.—Wash and cleanse the parts from sand and dirt, and if the skin is ragged and torn, clip off with a good pair of scissors. After this is done, ascertain if there is any discharge from the sore of an oily substance, and if so get a smooth piece of iron, immerse it for ten minutes in boiling water, and apply it to the edges of the wound, so as to cause the parts to swell, and prevent the escape of the joint oil; for if this be allowed to escape, the ends of the bones will come against one another. Irritation and inflammation will be set up, and either destroy the horse, or make a stiff joint. This is an important point to be observed, and that very early in all cases of broken knees or open joints wherever situated. After the hot iron has been applied, use the following wash twice in the day:—Sulphate of zinc, half an ounce; rain, or soft water, eight ounces. Mix. This will heal the sore, and prevent proud flesh from growing. This wash will answer for the more simple wound of the knee, and where there is no open joint. Do not apply bandages, as they will cause the whole leg to inflame and swell. Sometimes a kind of pouch will be formed by the lower edge of the wound, holding whatever pus or other fluid may escape. This pouch should be opened at its lowest bottom, so as to let the fluids out, and to prevent a bulge or permanent swelling remaining after the knee has otherwise healed. By attention to this, very little or no blemish or scar will be left.

Burns.—Treatment.—For burns the best application will be, one pint of linseed oil, and half a pint of lime water, stirred together, or rather whip-

ped (as cooks usually do eggs), till the mixture is like thick cream. This is to be applied to the burned places, spread on cotton or linen rags, for a few days; then the sores are to be dressed with green ointment.

Capped Elbow.—This an enlargement on the point of the elbow, just behind the shoulder, and on the side of the chest; sometimes it is in the form of a simple abscess, (which see.) But the usual form is that of an encysted tumor, or a fluid contained within a cyst of fleshy walls, which do not suppurate.

Cause.—The horse, when lying, rests the point of the elbow upon the heels of the front shoe. It is a symptom of disease of the leg, preventing the animal from properly bending the leg proper upon its thigh or arm.

Prevention.—Remove whatever disease may be in the leg, and place a pad of leather, or of coarse, heavy cloth, over the back part of the foot.

Treatment.—Make an incision with a sharp knife through the skin, over the back part of the foot.

Capped Hock.—This is a soft swelling on the point of the hock-joint.

Causes.—Kicking in the stable or in harness, and often occasioned by the whiffletree coming in contact with the parts.

Treatment.—Apply cold water cloths to the part for a few days, taking them off at night. After the heat and tenderness have subsided, apply, with rubbing, once every fifth day, for three times, if it be necessary, an ointment composed of one drachm of iodide of mercury; and hog's lard, one ounce. Mix.

Castration.—This is an operation for the purpose of depriving the horse-colt of his entirety by the removal of the testicles. While it is a simple and safe operation, we should advise that a competent experienced operator be employed.

Cataract.—(See Eye Diseases.)

Catarrh.—(See Cold.)

Chest Diseases.—The diseases of the chest are many and important. In it are the heart, lungs, and great blood-vessels. The diseases of these organs will be found under Inflammation of the Lungs, or Lung Fever, Pleurisy, Coughs, Bronchitis, and Glanders.

Chest Founder.—(See Founder.)

Chill.—This term means a shiver, as if the horse were cold. This is the way many diseases and fevers are ushered in. If the chill be checked soon, it will stop, in many cases, the disease that was forming. For this purpose, give twenty drops of the tincture of aconite root in a wine-glassful of water, and pour down the throat, out of a short-necked bottle; cover the body with a blanket, and rub the legs to bring the circulation to the surface of the body, and all will be well.

Choking.—Very rarely occurs in horses. (See Choking in Cattle.)

Colic.—Flatulent and Spasmodic.

SPASMODIC COLIC.—It is a spasmodic contraction of the muscular fibres of the intestines. In an ordinary case there is no great amount of the intestines contracted, perhaps, only a few inches. Most owners of horses have at one time or another had to deal with cases of colic. It is a common complaint, and one in which the symptoms are in some respects similar to those in cases of inflammation of the intestines. For the purpose of presenting to our readers a very plain account of the symptoms in both complaints, we add the following description:

The symptoms by which the genuine Spasmodic COLIC *is known.*

1. *Pulse*, natural or lower, though a little quickened during the paroxysms of pain, and fuller.
2. Sudden in its attack, but without fever.
3. Looks at his sides, lies down suddenly, the animal begins to paw and cringe, and rolls upon his back, as if relieved thereby, scrapes the ground with his fore foot and almost strikes his belly with one of his hind ones.
4. *Legs* and *ears* of their natural warmth, but the body according to the severity of the spasms breaks out into a sweat.
5. Relief is afforded by rubbing the *belly*, flathanded.
6. Intervals of rest from pain.
7. Relief obtained from walking about.
8. Strength scarcely affected.
9. Lining of the nostrils natural.
10. Inner lining of the eyelid natural.
11. Motion of the bowels little; unless when purgation comes on.

INFLAMMATION *of the Bowels has these contra-distinguishing symptoms.*

1. Pulse much quickened, running up to seventy or more, but small, and scarcely distinct.
2. *Gradual* in its approach, with previous *symptoms of fever*.
3. Lies down; but suddenly jumps up again, seldom rolling on his back.
4. Legs and ears generally cold.
5. Belly exceedingly tender, and painful to the very slightest touch
6. In colic there are times of ease from pain, but there is no let up in this disease.
7. Motion evidently increases pain.
8. Rapid and marked prostration of strength.
9. Great redness within the nostrils.
10. Lining of the eyelids very red.
11. Excited action of the bowels; anus hot.

Causes.—One of the principal causes of spasmodic colic is a change of food, external chilliness by exposure, giving very cold water when the animal is heated sometimes causes it, frozen roots also are liable to bring on an attack. Sudden changes in the temperature may cause it in horses that have shewn themselves liable to attack. Although spasmodic colic is painful, and sometimes very violent in its attack, it is rarely fatal, and is usually only of short duration.

Treatment.—Bleeding was at one time considered the only correct thing to do, but now a more enlightened style of treatment prevails. Nearly every Vet. has his favorite remedy, but in a work like this intended for the use of

a class a large majority of whom are not in close proximity to a drug store, we recommend the most simple of the many remedies prescribed. One of the most famous practitioners in Canada recommends from one to two ounces of sweets spirits of nitre, from one to two ounces of laudanum in six ounces of water, if you give an injection add a little turpentine to it. If after giving this dose there is no relief repeat it in half an hour. If you have neither the nitre or laudanum in the house, a quart of warm ale, with a little ginger if it is handy, or a good dose of whisky may prove as effectual. If necessary give an injection of warm (not hot) water with a little soap and a handful of common salt in it. Let the horse be in a comfortable place, if possible in a stall with plenty of straw under him, and sufficiently large for him to roll about. Rub the belly well, steady friction gives great relief, if the attack is a severe one you might use judicious counter-irritation such as hot water, mustard, etc. If you own a horse that is subject to attacks of spasmotic colic the sooner you get rid of him the better, some day the attack will terminate fatally.

FLATULENT COLIC.—This is a disease of very frequent occurrence among horses. It is known by a distension of the intestines and abdomen, with flatus or gas. In the early stage, no perceptible abdominal distension occurs, yet it very soon manifests itself. One way of satisfying ourselves of the presence of gas is, to apply the ear to the abdominal region, within which a sort of active rumbling is heard, often accompanied by a tinkling or metallic sound. But while making our examination, we may, perhaps, perceive that the horse passes gas by the anus, or expels it from the stomach by the mouth. In either case, our doubts, if we have any, are set at rest. This feature of flatulency, accompanied by others which will be alluded to, complete the chain of evidence.

Symptoms—It may be well to bear in mind that flatulent colic is always sudden in its attacks, and some horses are liable to it under every variety of circumstances—in the stable, on the road, or at grass. At the commencement of the attack the animal becomes uneasy from pain, and commences to paw with his fore-feet. He soon gets down, and, if space be sufficient, he commences to roll from side to side, often remaining for a few moments on his back, in which position he seems to obtain temporary relief. Sometimes, as quick as thought, he is on his legs again, gives the body a shake, and then anxiously regards his flanks, by turning his head toward one side or the other. Soon he is down again on the floor, rolling and tumbling about. Now and then the animal remains quiet for a time, in a sort of crouching attitude, the limbs being gathered beneath the body, until the distension is so great, or the pains so severe, that he must shift his position, when again we find him rolling, or standing with his hind extremities stretched backward, and the fore ones advanced, thus representing the attitude of a horse in the act of urinating. Supposing, at this period, that there be no flatulency present yet the respirations are hurried, the pulse wiry, the eyes glassy, and the

patient excessively nervous and uncontrollable, the case is then of a spasmodic character (see Spasmodic Colic); but should the animal pass gas, or the abdomen increase in volume, the case is unmistakable—it is flatulent colic.

Notwithstanding our best efforts to prevent it, colic will occasionally occur. Green grass, clover, carrots, and turnips are said to occasion it. Then again it appears in stables, where nothing but corn, oats, and hay are used. One horse is attacked immediately after a draught of cold water; another has the chill taken off his, yet he is often found in the same predicament. Warm water is the most insipid and nauseating drink that you can offer a horse; and many would prefer to continue thirsty for some time ere they would imbibe it.

Treatment.—Try injections first, as in many cases this complaint can be cured by this means alone. If gas or wind come away with the injection, the case will soon end well. When no benefit is derived from the injections, give, in a little cold water, aloes in powder, one ounce; sulphuric ether, one ounce; tincture of opium, two ounces. Another valuable *recipe* is fluid extract of Jamaica ginger, 2 oz. Fluid extract of Golden Seal, 1 oz. Powdered hyposulphite of soda, 1 oz. Water, 4 oz. Dissolve the soda in the water, then add the other ingredients to it. The dose may be repeated if necessary. A good wisp of straw, vigorously used on the belly and flanks, is likely to do some good. Injections of soap-suds should also be administered often, and if the case be not a hopeless one the horse will soon recover.

Congestion of the Lungs.—(See Lung Diseases.)

Constipation.—A confined condition of the bowels accompanying fever, liver and lung diseases; also from inferior food, etc. Horses habitually costive should be supplied with soft feed and grass in season. If the bowels are obstinately costive, give from six to eight drachms of aloes, once or twice a day. You may also give him an injection with about half an ounce of turpentine in it. Don't use too much soap in the injection as it may cause undue irritation.

Consumption.—Causes.—Repeated attacks of influenza, lung fever, or bronchitis, or any of these diseases treated by bleeding, and other reducing remedies or agents. Consumption, in the horse, runs its course in from one to three weeks, and is incurable.

Contagion.—This term is applied to something (as the *virus* of glanders) coming in contact with the body of an animal in health, producing a similar disease to that existing in the animal from which it came. In a word, it is a specific poison. Few diseases of animals are considered contagious. The following diseases, however, are considered of that character:—Glanders, in horses; contagious typhus and small pox, in cattle and sheep. Although many animals may be taken sick one after another, this is no proof that the disease is contagious; for it must be remembered that a number of animals

all situated and cared for in the same way, are certainly subjected to the same exciting causes that produced the disease in the first animal affected. Those that escaped the disease were not predisposed to take it; hence their exemption from its effects.

Prevention.—Separate the sick from the well. All buckets, or other materials, that were in contact with the sick, must be thoroughly cleansed and purified.

Contraction.—(See Foot Diseases.)

Corns.—(See Foot Diseases.)

Cough.—A *symptom* of disease of the respiratory organs, as tubercles of the lungs, thickening of the lining membranes of the windpipes, and enlargement of the glands of the neck.

Cough Chronic.—Is an indication of broken wind or heaves. It is aggravated by sudden changes in the weather.

Treatment.—Fluid extract of bloodroot, 4 oz; common syrup, 6 oz. Mix. Dose, three tablespoonfuls per day. Also sprinkle in the food every night a handful of unground flaxseed.

Cow Hock.—This name is applied to a condition or malformation of those hocks that incline forward.

Cramp.—Cramp of the stomach or bowels of horses, cannot readily be distingnished from spasmodic colic, (which see.)

Crib-Biting.—This is not a disease, but a vice—a bad habit, which the horse has learned, of sucking wind into the stomach by placing his lips against the manger. The habit has been so strong in some horses, that when they could get no place to press the lips against, they have stooped down and placed the lips against the arm of their own front leg. This vice is sometimes called wind-sucking.

Causes.—Idleness, indigestion, and learning it from other animals in the same stable.

Prevention.—Keep horses in loose boxes, or other places where there are no fixtures but the walls; regular feed and regular work.

Curb.—One of the many diseases of the hock-joint, and consists in a swelling immediately below the point of the hock-joint, and is the result of sprain of the posterior straight ligament; is more frequent in horses with the hocks inclining forwards, (cow hock.) The chief cause of curb is sprain, occurring by backing heavy loads, in leaping, etc. The treatment best adapted is the ointment of the red iodide of mercury, (see Ointments.) Apply about the size of a hickory-nut in quantity every sixth day for a few weeks, occasionally greasing or oiling the parts to prevent the skin cracking.

Or use powdered cantharides, (Spanish fly,) one drachm, mixed with four ounces of lard; clip the hair off, and rub in for fully ten minutes; wash it off twenty-four hours afterwards, and rub the spot with a little lard each day to prevent the skin cracking.

Diarrhœa.—Simple Diarrhœa consists of a looseness, or fluid condition of excrement, from something irritant in the bowels, and which does not freely pass away. When this condition is present, and no pain, griping or pawing as in colic, it may be well let alone.

Continued Diarrhœa.—This is often the case when irritation does not pass away with the offending matter, and the bowels continue to discharge a thin fluid.

Treatment.—From whatever cause the diarrhœa may arise, treatment that will allay pain is demanded. First. Give fifteen to twenty drops of the tincture of aconite root in a little cold water. Then give the following powder every two hours, until a change for the better has taken place:—Prepared chalk, half an ounce; catechu in powder, one drachm; opium in powder, ten grains. Allow the animal plenty of water to drink, which will help to allay irritation, or what disposition there may be to inflammation. Bran mashes should be given for a few days, so as to overcome the effects of so much drying or binding medicine. Ground flaxseed will be an excellent assistant in this particular.

Disinfectants—Are such as remove the *causes* of infection, or any injurious taint. To accomplish this effect, disinfectants will have to embrace a class of substances known by the name of antiseptics, (agents which prevent animal or vegetable matter being decomposed,) and deodorizers, (agents which destroy hurtful or bad smells, when arising from decomposing material.

Natural Disinfectants.—The atmospheric is the great disinfectant. The soil has been found a valuable disinfectant, decomposing animal matter with great quickness, and sending out gases which are without taint of any kind. Hence, the necessity of deep burial of animals dying, or that have been killed, on account of contagious diseases.

Ventilation is entirely a mechanical plan of disinfecting, and which it is in the power of every farmer in the land to more or less perfect in all buildings containing horses, cattle, etc. In ventilating, it is only necessary to admit the purest air, and for this purpose have the openings, or ventilators placed at least eight to ten feet from the ground, as it is well known that heavy vapors are sometimes seen a few feet above the ground. Also, the ventilation should come from the front or top of the building, as the back of a stable is never so pure as its front.

Water is the next great disinfectant employed bp nature, although moist bodies decay more rapidly than dry. It is a disinfectant by the process of washing, which is mechanical. It is in this way that each shower of rain

becomes a natural disinfectant. Light is another disinfectant, which seems to have been overlooked by many, when their barns and stables were built. Without light, the rose would lose its color, and man and animals would lose and never attain their vigor.

In proof of the advantage of light in maintaining health and warding off disease, it is stated that in a barrack at St. Petersburg, there was only one case of disease on the side laid open to the light, to three on the dark side.

Heat and cold are two agents highly useful as disinfectants. Heat prevents fermentation and decay by drying and changing the chemical state of substances, as it were, by cooking, whether by fire or the sun. Cold, again, is the most powerful antiseptic and disinfectant. Frosts prevent decay and disease, and at the same time share the connection existing between them.

ARTIFICIAL DISINFECTANTS.—Creosote is a most powerful antiseptic and disinfectant, when applied to a part, but it is not easily managed. Smoke is another good antiseptic, as it contains a little creosote. By it herring and other fish are preserved.

Spices, and other aromatic substances, have long been used as disinfectants, but they possess no such property, as they do not prevent decompostion of bodies; they merely cover the smell.

Chloride of lime and chloride of zinc act as good disinfectants.

The chloride of manganese is certainly as economical a disinfectant as can be used by a farmer. It is cheap and efficient, and not dangerous like chloride of zinc.

Sulphurous acid, or rather its fumes, has, in all ages, been used as a disinfectant, and by general consent is considered to be most valuable. Its action on animal and vegetable substances is readily seen by the change in color produced. In the form of sulphite of soda, it will arrest the vinous fermentation in cider and other materials; or if injected into the veins of dead animals, it embalms them most perfectly.

Distemper.—(See Influenza and Strangles.)

Dropsies.—Every school boy is familiar with the term dropsy, which means an unnatural accumulation of water in the cavities of the body-chest, heart-case, belly, breast, sheath, and cellular tissue of the legs. (See Debility.)

1. When water is in the chest it is called HYDROTHORAX. This is the immediate cause of death, in pleurisy in the horse, and pleuro-pneumonia in cattle, the animal dying by suffocation or asphyxia.

2. When in the belly, it is called ASCITES.

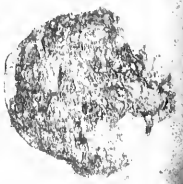
3. When in the cellular tissue, and confined to a portion only of the body, as the leg or sheath, it is called ŒDEMA; but if the swellings are over different portions of the body, it is called ANASARCA.

4. When in the heart-case or pericardium, it is called DROPSY OF THE HEART.

Causes.—Treatment of diseases by starving, or low diet, bleeding, blistering, and physicking. Injury to a part will be followed by watery swellings in the neighboring parts.

Treatment.—Blood-making food and medicines, are imperatively demanded. Corn-meal mixed with bran and cut hay. Grass, if it can be had. A bottle of strong beef tea given daily, will be of great use. Give the following medicine three times a day, either mixed in the feed or poured down the mouth with a bottle: Powdered sulphate of iron, one drachm; powdered gentian root, two drachms; Spanish fly, two grains. Mix. Or equally good, use one drachm each of iodine and iodide of potassium. Friction over the swelling will be of use. Sometimes it will be necessary to make slight cuts through the skin to let out the imprisoned fluid. Do not blister such swelling, as it is apt to praduce ragged, running sores, difficult to heal, and leaving a blemish.

Ear Diseases.—SMALL TUMORS.—Sometimes tumors of various shapes and sizes are seen in the ear of the horse, producing a kind of canker in that organ.



Symptoms.—Shaking of the head; will not let much familiarity be made with it; running or starting back, when the collar or bridle is being taken over the ears.

Causes.—Irritation and inflammation of the skin of the ear, producing small pimples of proud flesh.

Treatment.—Removal with the knife, scissors, or caustic; then apply the simple ointment as for a simple sore.

Emetics.—Medicine, often taken into the stomach of man and some animals, causing them to vomit. The horse, ox, and sheep do not, or rather cannot vomit. Hence, *tartar emetic* has no effect upon them.

Enema.—(See Injection.)

Enteritis.—(See Bowel Diseases.)

Epizootic.—A disease that attacks many animals at the same time and season, originating in one common cause. Examples—epizootic-influenza in the horse, and pleura-pneumonia in cattle.

Eruptions.—Eruptions are more a symptom than a disease. (See Strangles, Surfeit, Stings of Insects, and Scarlatina.)

Eye, Diseases of the.—There a great many diseases of the eye, but as their treatment is beyond the ability of an unprofessional reader, we confine ourselves to one that is frequent.

MOON BLINDNESS, TERMINATING IN CATARACT.—This disease is a serious one, and frequent, consisting of inflammation of the internal parts of the eye-ball, the choroid coat and the iris particularly.

Symptoms.—In the morning, perhaps, the eyelids will be found closed; a large flow of tears; the back portion of the eye dim and clouded. No specks are to be seen, as in some other diseases of the eye. A yellow border will be observed at the bottom of the chamber. This is pus. The attack, or inflammation, will last from two to three weeks; at the end of which time the eye will brighten up, and the ordinary observer may think that the eye is completely cured. The pus is entirely absorbed, scarcely leaving any traces behind, except a degree of dimness. In one, two, or three months, and not by the regularity of the moon's changes, as horsemen suppose, the disease reappears, having the same symptoms and characteristics as in the first attack, only a greater deposit of pus will be left at each subsequent attack. One attack succeeds another until the whole pupil is filled with matter, constituting cataract, thus completely destroying the eyesight. This disease is usually at first confined to one eye, but in some cases both are affected, one usually more severely than the other.

Treatment.—This disease is deemed incurable, which fact has often induced the owner of an animal thus affected to sell him, being well aware that the disease will at no distant day return, and leave upon his hands a blind horse. An application of cold water and the tincture of opium should be used to allay pain and irritation; cold water, one ounce; tincture of opium, two drachms; can be applied by means of a feather.

Farcy.—The following, from that eminent authority, "Mayhew," is to the point:—

"Farcy is, by the generality of practitioners, regarded as a more tractable disease than glanders. Certainly the course of the disorder is arrested much easier; but, to cure the malady, there is a constitution to renovate and a virus to destroy. Is it in the power of medicine to restore the health and strength, which have been underfed, sapped by a foul atmosphere, and exhausted by overwork? Tonics may prop up or stimulate for a time; but the drunkard and the opium-eater, among human beings, can inform us that the potency of the best selected and the choicest drugs, most judiciously prescribed, and carefully prepared, is very limited. Sulphate of copper, iron, oak bark, cayenne pepper, and cantharides, probably, are the chief medicines the practitioner will give. With such the horse may be patched up; he may even return to work. But at what a risk! He carries about the seeds of a disorder contagious to the human species, and in man even more terrible than the quadruped. Is it lawful, is it right, to save an avaricious master the chance of a few shillings, and incur the risk of poisoning an innocent person? The author thinks not. Therefore he will give no directions how

to arrest the progress of farcy. The horse once contaminated is, indeed, very rarely or never cured."

Fatty Tumor.—(See Tumors.)

Fever, Putrid.—(See Typhosus.)

Fever, Sympathetic.—This variety of fever is that which is produced by accident and disease. Thus, a horse gets a nail in the sensitive part of the foot, excitement, or sympathetic is an accompaniment. Lung disease is accompanied with fever, and hence it is called lung fever. Fever in the feet is a common expression, signifying sympathetic fever. Indeed, it is a question, whether fevers of all kinds are not to be attributed to some local or general disturbance of some action or function of the body. Thus, the many fevers which attack the human family, can readily be traced to a predisposing cause; as, for example, typhus fever is caused by insufficient ventilation, besieged towns and garrisons, preventing the removal of filth.

Fever in the Feet.—This is a common disease of horses in large towns and cities, where the streets are paved with stone, whereby the concussion is very great, when horses are driven fast. (See Founder.)

Fistula.—Examples. Fistula of the shoulder, of the poll, poll-evil, (which see,) and quittor or sinuses of the foot, (which see.) Fistulas are usually deep-seated, but sometimes they are superficial, or just under the skin. However, although we see them sometimes so situated, it must be confessed that the cases are extremely rare. The fistula most frequent and difficult of cure is always deep-seated and in the vicinity of a joint, as the poll and shoulder. The reason of this is easy of explanation, for when these parts get injured, and suppurative action is set up, the pus, instead of pointing to the outward surface, burrows down in among the loose textures, and forms sinuses or pipes, pointing in several directions. Fistula differs from a simple abscess in this particular, and therefore is difficult of cure. The pus secreted is nearly the same. The pus in a simple abscess is secreted from, and is a liquification of, the surrounding tissue; but the pus of fistula is secreted from the walls of a fibrous sack, which is formed in most cases of fistula. The fistula may be open or whole, presenting a large swelling.

Symptoms.—Pain on pressure of the parts affected, followed by heat, pain, and swelling, circumscribed in shape, hard at first, and becoming soft and fluctuating upon pressure by the finger—a sure indication of fluid within. This swelling, from the firmness and integrity of the sack and skin in which it is enclosed, does not break, nor yet form sinuses that take on the character of an encysted tumor, which does not break of its own accord, as simple abscesses do. At other times, the fistulous tumor breaks or opens in several

places, and small holes discharge pus, some to-day and none to-morrow, The day the discharge is free, the pain and swelling is less.

Causes.—Bruises, accidents, inflammation of the bone, or any accident that will cause a simple abscess, will cause fistula.

A blow that would produce a common abscess on some portions of the body, will result in fistula in other portions, as in the vicinity of a joint.

Treatment.—If the swelling is forming, endeavor to put it back by placing chopped ice, in a bag, or cloths soaked in cold water and changed frequently, over it for a few days. By this means, many a swelling which would terminate in a fistula, will be cured at once. This not succeeding, have an opening made into its lowest side, so as the bloody water, which it at this time contains, will be discharged. Then syringe a half tablespoonful of the tincture of iodine into it once in the day for a few days, to eat or destroy the membranous sack. Then treat it as a common sore by keeping it clean, and the opening from closing before it has healed from the bottom. For this purpose, place a small piece of cotton in the mouth of the opening, smeared with simple ointment.

Fistula in the Foot.—This disease, by common consent, is called quittor, a fistulous abscess in the foot. (See Quittor.)

Flaxseed.—Every part of this seed is used one way or another in the treatment of diseases of the horse. The ground seed, mixed with warm water, is an excellent cooling food for horses, almost a laxative. The pressed juice, or oil, is a certain and safe purgative for the horse, in quart doses. The residue, which remains after the oil has been pressed, commonly called cake meal, when mixed with warm water, makes the best of poultices for a sore or wound.

Foot Disease.—(1.) CANKER IN THE FOOT.—This is an affection not easily managed from the peculiar tendency in the horses foot to grow and produce proud flesh, which is the essential principal of the affection. Canker in the foot of a horse may be said to be a foot deprived of a part of its sole. Not only so, but we have to change this disposition in the foot to throw out such material, and induce the material to secrete or produce a new sole. This is the difficulty to be experienced in the treatment of this affection. Nevertheless, cases, and very hard ones, too, have been cured, but not in a day, nor a week, but months.

Causes.—Injuries to the sensitive sole by nails, bruises, and other accidents, as a piece of the sole being torn off.

Treatment.—Removal of any diseased or dead sole, and the proud flesh. For this purpose, the knife will have to be used to remove the dead sole, and, if it be in the hands of an energetic person, the most of the fungus or proud flesh can be taken off in the same manner. If not, get caustic potash, and

quickly reduce it to a coarse powder, as it soon dissolves on exposure to the air. Lay it upon the raw surface. This apply next day, if the first application has not removed sufficient or all of it. After the proud flesh has been entirely taken off, or leveled with the sole proper, dress every day with Barbadoes tar, one pound; sulphuric acid, three drachms; powdered sulphate of copper, half an ounce. Mix well, and spread a portion over the sore foot, and over this dressing, a pad of tow or cotton, held firmly down on the padding, so as to produce *pressure*, an important matter in the treatment of canker in the foot. This can be secured by thin pieces of splint from young wood, being placed across one another over the pad, and the ends pushed in between the foot and the shoe. By this means, and a little patience, with a little ingenuity in fixing and applying these pads, etc., very bad cases can be cured.

CONTRACTION.—This is not so much a disease as it is bad management in the stable and in the blacksmith's shop. Contraction may be said to be an alteration in the shape and structure of the back portion of the hoof—a winding in of the heels.

Causes.—Want of proper knowledge on the part of the owner or horse-shoer in not knowing the difference between the foot that would require a piece added to it at each shoeing, and the one that requires a large portion taken from it, so as to assure elasticity and expansion. A foot strong and inelastic, and unyielding to the weight of the animal, is the very first foot to become contracted. I know flat, weak-footed horses travelling sound for ten or fifteen years without in the least being contracted. So long as we have strong-footed horses, and shod with an inflexible iron ring to prevent wear and tear, and the blacksmith neglects to take off of each hoof at the shoeing as much horn as the horse would have worn if he had been in the natural state and not shod, we will have contraction.

One-sided nailing is an excellent preventative as well as an assistant in the cure of contracted feet. What is meant by one-sided nailing is that nails are to be confined to the outside toe of the foot, so as to allow free expansion for the heels. This cannot be done with the shoe being nailed on by nails placed at each side. To illustrate this point, place a small horse-shoe flat in the palm of the hand with the fingers close to one another; then tie, with a piece of cord, the little finger to one side of the shoe, and the thumb to the other side; then you will realize to what extent you can expand the fingers so secured. So it is just with the foot of a horse with the shoe nailed on at each side. Remove the cord from one finger, and the whole hand is free to expand. So likewise the foot of a horse by one-sided nailing.

CORNS.—This is a red spot on the inner portion of the heel of the foot, more generally found on the fore feet, causing lameness, and consists of a bruise from the shoe pressing upon the part, the shoes having shifted from their proper position, or never having been placed there. In general, the pro-

duction of corns may be laid to the charge of the horse-shoer, and sometimes to the owner allowing the horse to go too long before the shoes are removed, or before the foot has grown from the shoes.

Treatment.—Remove the corns by cutting them out; then apply a few drops of commercial sulphuric acid to the part. Shoe the horse sufficiently often to insure even bearing to the shoe upon the wall only of the foot.

False Quarter.—This is a term applied to the horn or portion of the hoof, which overlaps or bulges out from the line of the sonnd portion of the hoof.

Cause.—An injury to the coronet or ligament, which secretes, or from which the hoof grows. This causes an alteration of the horn of the hoof below, corresponding to the extent of the injury.

Treatment.—As there will be an enlargement, more or less, remaining after an injury to the coronet, little will be required to be done, but to keep the horn as level with the hoof proper as possible, in order to make it look less of an eye-sore.

Inflammation of the Foot.—(See Founder.)

Pricks.—Pricks may occur in the act of shoeing, or from a nail being picked up on the street, and from other hard-pointed substances.

Treatment.—Pull the nail out, and poultice the foot for twenty-four hours; then make an opening shrough the horn, over the place where the nail went in, so as to allow the pus to escape. For if this be not done, and the pus is left in the foot, it will in a few days, and at a great expense of suffering to the horse, break out between the hoof and the hair, constituting quittor. After an opening has been properly made, drop five drops of muriatic acid into the hole once a day, for a day or two. Poultice every second night or day, and not oftener. A healthy hoof can be poulticed off by constant application.

The horse can go to work as soon as he can step on the ground firmly and without lameness. Remember, that in all cases of pricks and other injuries which end in suppuration, as pus in the foot of a horse, make a thorough opening so as to allow the pus to escape, and no more trouble need be apprehended; except the nail has entered into one of the tendons of the foot, in that case no pus will be usually formed, the majority of cases ending in locked-jaw, (which see). When pus is formed after pricking, no locked-jaw follows; it is in those cases only where pus is not found that locked-jaw may be ezpected.

Sand or Quarter Crack.—This is a crack or split in the hoof, usually on the inner side of the fore foot, although splits and cracks occur in all places, and in both fore and hind feet.

Causes.—A brittle condition of the hoof, from the want of sufficient moisture. In some cases the horse does not stand square upon his fore feet,

thereby causing undue weight to fall upon one of the sides of the hoof and causing it to crack.

Prevention.—Apply to brittle feet equal portions of the oil of tar, and cod liver oil, whale oil, or any fish oil well rubbed in with a brush to the hoofs a few times a week; and occasionally apply wet cloths to the feet in the summer season. In winter the feet are better supplied with moisture.

Treatment.—Rasp the edges of the crack thin, the nearer the crack the thinner the horn should be made; this can be filled up with shoemaker's wax. After the horn has been properly thinned a piece of the wall of the hoof, for about half an inch on each side of the crack, is to be cut out to prevent any bearing of the shoe upon it, thereby preventing the constant opening, shutting, and sometimes bleeding from the crack. To prevent, or rather to cause the new horn to grow down whole and without a crack in it, a piece of iron is to be placed in the fire and made red hot, and then applied, just for a moment, flat on the hair at the head of the crack sufficient to make a scab. This will insure a solid growth of horn. Promote the growth of the horn as speedily as possible, to facilitate the cure; a strap is used by some round the hoof to prevent opening of the crack.

Navicular Disease.—This is a disease of a bone in the foot of the horse; a serious disease, and often very obscure in its symptoms, altogether depending as to the advanced condition of the disease. Happily, however, it is rarely met with and then only in the common hack horse. It consists of ulceration, of various degrees, on the surface of the navicular bone within the foot.

Causes.—Hard and constant work upon streets paved with stones. Slight inflammation neglected and the horse not laid up until it gets well, and then inflammation increasing, until it ends in ulceration of the bone.

Symptom.—Obscure, or at least very like many of the symptoms similar to other diseases of the feet and legs. It is chiefly determined by the undue heat in the foot, and when the horse is first brought out from the stall in the morning he goes off lame but soon wears out of it.

Treatment.—If of long standing it is incurable, although much can be done to relieve the pain, by the application of moisture, poultices, and occasionally placing the hoof in warm water to soften and relieve pressure.

Seedy Toe.—This is a name given to a split in the centre of either fore or hind foot, extending a little way up from the point, or it may be up to the hair itself.

Causes.—The same as those producing sand-crack, (which see.)

Treatment.—In bad cases a clasp or plate of iron secured by short screws. In simple crack or split from the toe upwards, cut off all communication of the sound parts with the cracked or split portion. For this pur-

pose a three edged file will be a good instrument for making the division. At each shoeing the split portion will gradually become less or shorter.

PUMICED SOLE.—This name is used or applied to the sole of a foot, which is convex instead of concave; that is, instead of the nice cupped foot, the bottom of the saucer is presented.

Causes.—The result of bad or severe cases of founder, where the coffin bone is let down upon the sole, and causes its descent or convexity.

Treatment.—This is merely palliative and is to be done by placing a shoe upon the foot that will insure and protect the sole from the ground.

THRUSH.—A diseased condition of the sensitive frog of the foot, and from which a stinking fluid is discharged, which is familiar to every person who is among horses,

Causes.—Too much moisture to the foot, as from animals standing in their own manure, or from wet stabling, the frog becoming perverted, and deteriorating, and secreting, or discharging a blackish color, and otherwise nasty fluid. It sometimes accompanies navicular disease.

Prevention.—Dry stabling, a stall having sufficient inclination or drainage to carry off the fluids. Cleaning the stables regularly.

Treatment.—A few drops of muriatic acid forced into the centre of the frog once a day, for a few days. Keep the stable and stalls dry and clean. A few doses of the sulphite of soda in half ounce doses, once a day, for a few days, will do good by its alterative and curative effects upon the system.

TREAD.—This is, as its name indicates, a contused bruise inflicted on the coronet or immediately above the hoof by a tramp of the shoe on another foot, or even by another horse. Keep the wound clean, and apply the tincture of myrrh and aloes daily.

QUITTOR.—This is a serious and painful diecase of the foot, of the same nature as poll-evil and fistula in the shoulder; it is known by a large swelling around or above the hoof, or where the hair joins the hoof, which soon breaks and discharges pus.

Symptoms.—Horse off his feed. Considerable excitement and fever. Holding the foot off the ground, and very painful. A swelling soon shows itself at the coronet, and in a few days breaks and discharges pus. After this the horse will resume his feed, but will not make very free with his foot, which will be better to-day and worse the next day, depending upon the discharge of pus from the foot.

Causes.—A prick from a nail, a bruise on the sole, a suppurating corn, or sometimes from a sand crack taking on suppurative action.

Treatment.—The great secret of the treatment of this disease, is to make a free opening from the bottom of the foot. When this is done at once, you will be greatly surprised to see the swelling go away as quickly as it made its appearance, and if the swelling has broken, it will soon cease to discharge when the opening is made from below, or at the bottom of the foot. Having

effected this purpose of an opening, get a small syringe and inject into the opening above, if there be any, and if not from the opening below, a mixture of the sulphate of zinc, two ounces; rain water, eight ounces, once in the day. If the shoe has been taken off for the purpose of making the opening, have it put on again so as to hold some soft stopping in the sole to keep it soft. Cow dung is as good, if not better, for this purpose, than the best of costly flaxseed. Never in cases of this disease, apply poultices around the whole of the hoof, as in that case the hoof may fall off. Whatever poultice, it must be applied to the sole. If no opening has been made from below, drop ten drops of muriatic acid into the opening above, once in the day, for a few days. This will destroy the disease.

Founder.—ACUTE FOUNDER.—Every farm lad is familiar with the name of founder when applied to a lame horse, but few horsemen ever comprehend the nature and seat of this affliction. Founder in all its forms is inflammation of the laminæ or leaves, which dovetail into each other, and bind the sensible and insensible portions of the foot together. Hence, it is called by some learned persons in diseases of horses *laminitis*, by adding the Greek word *itis*. Founder is again called by some persons fever in the feet. However, as to names, the disease is of frequent occurrence, and when left to itself, destroys many good horses by leaving them ever afterward sore and tender in front, as the horsemen have it.

Symptoms.—The horse will scarcely move: stands upon his heels, with fore feet and legs stretched out as far as he can get to throw the weight off them. Thus, to all appearances, making the animal hollow in the breast, which appearance has given rise to the idea that the horse is chest foundered. The hind legs are brought far in under the belly. The head of the horse is erect and high. Fever and constitutional disturbance are very great. The horse is extremely excitable, and breathing fast and laborious. Altogether, the poor suffering animal is the very picture of distress and disease.

Causes.—Giving cold water when overheated, and tired from overwork, A tendency in the feet to take on inflammatory action. The animal not in proper health or condition for performing heavy or fast work,

Treatment.—Place the horse in a wide and airy stall, with plenty of good straw for bedding to encourage the horse to lie down, which will relieve him very much. After the place is all fixed, and the horse moved into it, give him from fifteen to twenty drops of the tincture of aconite root in a cupful of cold water, poured into the mouth with a bottle having a strong neck. Repeat the dose every four hours, till six doses have been given. Apply cold water cloths to the feet. In a few hours, possibly, the shoes may be taken off. At first, this cannot be done, except the animal is down. Care should be taken in removing the shoes, so that every nail is made loose before an attempt is made to pull off the shoes. Have as little hammering on the

foot as possible, as it will shake the great and over-sensitive frame. Let the cold water be kept on constantly for the first day, or until the active pain gives way. At leisure, the feet can be pared thin on the soles, so they will yield to pressure with the fingers. By getting the animal to lie down as soon as possible after he gets in ; the cold water cloths applied, and the aconite given ; the animal in a day or two may be nothing the worse from the attack. The longer the animal remains before these remedies are applied, the less likely is he to be free from its effect afterwards. Before the horse is again put to work, be sure he has quite recovered. During the treatment give plenty of cold water to drink. Never give tepid water to a horse while he is sick from disease. Give grass or soft mashes for a day or two, but do not keep a sick horse too long on low feed, as debility and swelling of the legs and various portions of the body will take place.

Another valuable treatment for this disease, and a favorite one with several distinguished Canadian "Vets," is to give two or three drachms of nitrate of potash, two or three times a day ; give it in water, and allow plenty of water, not much at a time, but give it often until the physic begins to act, and then be careful with its use ; and when you see the animal getting better, don't be anxious to push any more medicine. A horse that has suffered from this should be carefully used for some time afterwards. If he is put to work too soon, he is liable to get worse than ever.

Remember.—Do not bleed, neither from the neck, nor foot, nor from any place else in a disease of this kind.

Chronic Founder.—Symptoms, Cause and Treatment will be much the same, only it will not be necessary to push the treatment so far. Principally depend upon softening the horn of the feet, paring the soles of the feet, and a few days' rest. The horse, for a week or two afterwards, should be placed in a stall having six inches of sawdust spread over it, and kept a little moist with water poured over it once a day. When horses are recovering from acute founder, they also might be placed in a stall so prepared. Clay stalls are objectionable.

Fractures.—This term signifies a broken bone. Fractures are the result of great force applied to the bone, as from kicks, falls, and accidents, and can only be treated by a skillful practitioner.

Frost Bites.—The results of frost bites may be called chilblains, which again give rise to extreme swellings of the heels and back parts of the hind legs, until finally the skin gives way, terminating in sores and ulcers that may at once be taken for scratches. The sores are deeper in such cases than in scratches or greasy legs, but closely resemble a malignant ulcer. In the worst cases we have seen, the skin and flesh sloughed, followed by gangrene or mortification of the leg, and death of the horse from the poison thus produced and absorbed. We have seen several cases of frost bites in different

stages and severities, and which, in all cases, was the result of broken and imperfect doors facing the northern exposure, and behind which stood the hind legs and heels of the horse.

Treatment.—If the legs be found, on opening the stable, to be swollen and painful, rub the parts with snow or ice-cold water, then follow *gradually* with warmer water, a degree or two above freezing; and when warmth is restored, bathe with weak spirits. When the legs and heels break into sores and ulcers, apply, twice daily, carbolic acid (in crystals), four drachms; olive oil, four ounces. Mix.

Gangrene.—This is a name applied to, or is synonymous with mortification or death of a part, and is characterized by a livid or black color. Gangrene is attended, or is ushered in, by a sudden giving way of pain, which has often been mistaken for recovery. When gangrene of an outward or external part takes place, there is a change in the condition of the part, it assumes a different aspect, the swelling subsides, and upon touching the part a crackling sound is produced, owing to the evolution of gas.

Glanders.—Is contagious, and a most serious and loathsome disease. It has been known for thousands of years, and has been treated with almost every medicine, and nothing has proved a remedy, and veterinarians have been abused for not curing it. They have pointed out the true character of it, and it is now rare to what it was thirty or forty years ago. It was common in Canada when the country was being cleared up, but it is now not so frequent. This disease consists in a discharge from one or both nostrils, which discharge will produce it in another horse and in man. It is found generally in the horse, and in man, but is said to be communicable to sheep, dogs, cats, and even to cattle. It is a specific disease of a contagious character, due to the introduction of a poison into the blood, or to the generation of a blood poison within the system. These two terms are used for the same thing, but do not mean just the same; the volatile form being infectious, the fixed being contagious. Although mostly due to contagium, it is sometimes spontaneously generated. It is most severe in countries where horses are kept in a highly artificial manner, while in countries where they are allowed to run out during the most of the year, it is not so common. It was not known in Mexico until the war with the United States. It is said it does not exist in Australia, and is seldom seen in India except in imported horses, as their horses run out the most of the year. It is supposed to have got into India through imported horses. With glanders we also have farcy. They are essentially the same disease, only different in their manifestations. Farcy will produce glanders, and glanders farcy, by taking the virus from one or the other. So both diseases are due to a blood poison essentially the same, but they differ in their external manifestations.

Symptoms.—After it arrives at a certain stage it is easily diagnosed, but

until then it is not. It may continue for a long time without showing any constitutional disturbance, and it may be mistaken for other diseases. Some are liable to think that it is nasal gleet, unless the animal soon dies. Just in the early stage of the disease the animal suffers from rigors, more or less. Pulse is increased to 103°, 104°, or 105°; then it will go for some time, and then there is a discharge from the nose, which varies much, according to the disease; at first watery, and then purulent, coming more freely in some cases than others. It may be from one or both nostrils—usually from one, and that the left. By and by there is a cough, which may continue; the discharge is altered to some extent; the most noticeable peculiarity of the discharge is that it is of a sticky character; it sticks around the nostril and has a tendency to stick the nostrils together; for, after the discharge has been developed for some time, and is high up and affects the bone, there may be a strong smell, but not so fetid as in nasal gleet. But if you have this discharge of a greenish-yellow color, extremely sticky, and which adheres around the nostril; contains large amount of albumen; and will sink readily in water, the character of the discharge will vary, and it may be tinged with blood, and if so, it is symptomatic of an acute attack. The eye will sympathize with the disease, giving rise to a sort of purulent discharge, not profuse, and it may not be present at all. But when you notice these, it is a significant symptom of glanders. There may be some difficulty in breathing, for there are more or less changes in the lungs on account of tubercular deposits in the lungs. The animal falls off in condition, becomes emaciated, hide-bound; the skin seems to be attached to the flesh; gradually pines away, and dies a lingering death. If in the chronic form until these characteristic symptoms—ulceration of the mucous membrane, greenish-yellow discharge, indurated condition of the glands—are well developed, you may experience difficulty in coming to a correct conclusion. When emaciation is rapid, it may be a long time before these characteristic symptoms are developed. This was noticed in a certain stable in France where glanders made its appearance. Close examination was made; those affected removed, and after some time more were affected, and removed, etc., and it was found to exist in some that had showed no visible signs. It was, perhaps, due to tubercular deposits in the lungs that gave it to others. There are certain diseases that might be mistaken for glanders. In nasal gleet there is a discharge from one or both nostrils, but it is not as sticky; there are no cancerous ulcers. There is also one sign never absent in this disease, and that is the enlarged gland under the jaw; hence the name of the disease—glanders.

Treatment.—Incurable. Destroy the animal.

Gleet.—(*Nasal.*)—This term is used to denote a thin, transparent discharge from the nose in cases of coryza, and as a sequel to catarrh and cold in old and debilitated horses. Whilst there are no ulcers on the lining mem-

brane of the nose, or no enlargement of gland under the jaw, the case may be dismissed as simple gleet, which can be readily cured by good feeding and a few tonic powders, such as powdered sulphate of copper, three ounces; powdered gentian root, four ounces; powdered Spanish fly, one drachm. Mix and divide into twelve powders, and give one powder once in the twenty-four hours. These powders will last two weeks, and can be renewed if necessary. Give the powders in large bulk or cut feed, so as to protect the coat of the stomach from the effects of the Spanish fly.

Granulation.—This means the little red portions of flesh, which grow in and fill up holes made by wounds. Sometimes these grow too fast; then they are unhealthy, being soft, and grow beyond the edges of the wound. To prevent this, sprinkle a little powdered bluestone, or a little sulphate of zinc, and the wound will soon heal level with the surrounding surface.

Gravel in the Foot.—This name conveys an impression that sand or gravel has got into the foot, which is often the case from cracks or other openings in the foot, whether from above or below. Wash out the sand, if possible; if not, remove some of the horn, and wash out well, and fill up the hole by shoemaker's wax applied hot, and smoothed over by the hand previously wet, so the warm wax will not stick to it. If the opening be in the sole, shoe with leather soles, tar and cotton, until the hole has grown out or closed up.

Grease.—This is a disease of the heels and legs of horses, characterized by an unsightly condition of the parts. The whole being the result of scratches; is more common in coarse-bred horses, and heavy breeds, than in well or fine bred horses.

Causes.—Sudden changes of the temperature of the earth, whether from heat to cold, or from wet to dry. Washing, and not drying the limbs; standing in filthy stables, which provides another cause for it appearing oftener in the hind legs than in the fore ones. Again high feeding and lack of exercise in the case of young horses, etc.

Symptoms.—At first a slight swelling of the limbs. After some time there is redness of the heels, which, in the case of a white skinned horse, can be very easily distinguished. The hair stands out prominently at an early stage, and there is a slight discharge of oily, greasy matter, hence its name, "grease." The parts also become hot and tender. The animal walks stiff, in fact, is almost lame; cracks appear in the heels and sometimes extend right up to the fetlocks.

Treatment.—Keep the legs clean and dry, and apply the following mixture to the heels, twice daily:—Saltpetre 2 ounces; glycerine, 4 ounces. Mix, and shake up before using. Each time the solution is applied, it would be well to dust the parts with charcoal powder; this has a most

beneficial effect. While under treatment, the horse should be prepared by giving him bran mashes, then give him six or eight drachms of aloes. A light horse will not require as big a dose as a heavy horse.

Many cases are readily cured by simply keeping the heels clean, and annointing with glycerine, or lard, having no salt in it. It must be confessed by every body, who has had any experience at all in the treatment of this disease, that there is uncertainty of an early cure; some cases will be cured in a short time, and in others it would seem that the discharge would never dry up and be healed. For cases that prove very obstinate, the following plan often effects a cure, when other remedies have failed: Take one box of concentrated lye, and dissolve it in two quarts of water, and bottle up for use when wanted, in the following way: Pour a wine-glassful of the solution of lye into a small bucket of cold water, and wash and bath the heels and legs for half an hour, morning and night. A great change for the better is likely to be seen in a day or two. This wash seems to have the power of relaxing and softening the skin, and at the same time causes the legs to sweat greatly. Dry them as often after the bathing as you like, there will pour out great quantities of moisture from the skin as soon as you have done.

Shot of Grease.—This is a different disease from the one described, from the fact that it attacks only one leg, and that one of the hind ones, and comes on in a night, without any preceding symptoms whatever, and hence it is called a shot of grease. There is no cracking of the skin of the heels or legs, but it remains whole and unbroken.

Cause.—Robust stamina, or too fat and full of flesh, and to get rid of this superfluity, plastic lymph is thrown into one of the hind legs, which causes swelling of the leg to an enormous size. This disease is not unlike the milk leg in the human family.

Treatment.—If the disease be observed early or before the leg becomes hard, give slop feed, that is, bran with plenty of water in it.. Also give ounce doses of the sulphate of soda once in the day, for a few days, and bathe the legs three times in the day with the same solution of concentrated lye as is recommended in grease, (which see.) If the swelling does not lessen in two days, then make one or two small incisions through the skin, for the purpose of letting out the imprisoned fluid before the arteries of the leg have become *plugged* or filled up, which constitute the thick or fat leg so often seen in horses in large cities. Many good horses have been rendered of little value from want of a knowledge of this disease and its proper treatment.

Gripes.—This name is sometimes applied to colic, (which see.)

Grunter.—This name is applied to horses that give forth a grunting noise. One condition giving rise to wheezing, roaring, whistling, piping and rattling, will, with slight modification, produce a grunter.

Observe.—If the collar is not too tight on the neck, interfering with the free passage of air in and out of the windpipe.

Causes.—Generally from some thickening of the glands of the neck, or of the windpipe—the effects of bronchitis or distemper, not treated, or improperly treated, in not supporting the strength, whereby all thickenings are taken up, or reduced and even prevented.

Gullet, Obstructions in the.—(See Choking.)

Heaves.—This is a term in frequent use, but not so well understood as it ought to be, seeing its importance as to the proper value of an animal. It is a common disease among Canadian horses. Heaves may be defined as a difficulty in breathing, whereby the value and usefulness of the horse is seriously impaired. There is every degree of intensity to be seen in this disease. Some animals are so seriously affected, that it is hard to look at the terrible efforts made in the act of respiration. The deep and not suffered-to-be-completed respiration tells the tale of great asthmatic effort and oppression. In others, it is so slight that only experts can observe it; not from the quickness of breathing, nor yet from its depth, but from a peculiar double beat or hitch, differing from all other varieties of breathing, either of fever, inflammation, or debility

Causes.—The causes that produce this disease are often the result of injudicious feeding and fast exertion after a heavy feed, which causes an increased rush of blood to the lungs, often by feeding upon dusty feed, etc.

Treatment.—If a confirmed case it is incurable, but it may be relieved by regular feeding and never allowing the animal to overload the stomach. Give the best of chopped feed, and you may try the following: one drachm each of camphor, opium, digitalis, given every day for three or four days.

Heat.—General heat of the skin indicates fever; local heat, inflammation.

Hepatic Diseases.—(See Liver, Inflammation of the.)

Hernia.—This is a name given to ruptures, (see Ruptures.)

Herpes.—A name used in skin diseases, (see Mange and Skin Diseases.)

Hereditary Diseases.—No one, of any observation, can deny that hereditary influence exists in the production of disease. This influence must not, in the production of disease, be considered as invariably reliable. The fact of horses or mares having a disease, is no reason why their young will have the same disease, also. It was through change or alteration of structure, action or function, that existed in either of the parents, that disease fastened upon them, and these same forms which existed in them are likely to

be transmitted to the offspring, thus carrying the various formations of structure, which will ultimately, in all probability, produce the same disease. A great number of the affections, which are usually styled hereditary, do not make their appearance until years after their birth, because it requires time and work to develop them. Few persons would expect a horse with cow hock, (which see,) to become curbed without work, as a secondary cause. There is one point worthy of remark, in speaking of hereditary diseases, which is that many animals, after being poorly bred, have been badly fed and cared for; whereas if good feeding and care had been bestowed upon them, it would have gone a long way in lessening the certainty of developing hereditary diseases in them, and their offspring. This is every day being illustrated in the family of man. There are several rules laid down to be observed as measures to prevent and modify conditions which result in producing diseases of hereditary predisposition.

Hide Bound.—This, properly speaking, is not a disease, but the symptom of a bad condition, "out of sorts," debility, etc.

Treatment.—The best remedy, if the season permits, is a run to grass, taking care to give a good feed of oats at night, otherwise the grass will not improve his condition. In the stable the treatment is as follows: Feed mixed feed—cut hay, oat meal, and bran in fair proportion—with no more water than will keep the particles together. Give the following powder in feed every night, for twelve nights: Powdered sulphate of iron, three drachms; powdered gentian root, four drachms. Mix. If the animal is fat and yet hide bound, substitute the following, instead of the above recommended: Take sulphuret of antimony, three drachms; sulphur in flour, three drachms; sulphite of soda, half an ounce. Mix, and give in one dose, repeating it every night for two weeks. If in the winter, use an extra blanket.

Hip-joint Disease.—Happily, this is a very rare disease in horses, and does not make its appearance so soon as in man. It is always the result of accident or injury, and is a joint affection—not of the muscles, because the mass of muscles are so very great over the hip, that it is not an easy matter to sprain them. Among horsemen it is a great bug-bear, often occurring in their ideas; whereas, in ninety-nine cases out of a hundred of their so-called hip and *whirl bone* disease, the lameness will be found in the hock joint. Why do they jump at the conclusion that the lameness is in the hip? Because in every movement of the hock-joint, the vibration or hitch is more distinctly seen by the altered action of the muscles of the hip, as when the hock-joint moves but partially, and not completely, it is not so readily seen at the hock as at the hip.

Symptoms.—Lowness or falling in of the hip; a peculiar manner of moving, not indicating inability as is seen in fracture of the pelvis bone, but of great pain and difficulty; not yielding or bending low down on that quar-

ter when the horse takes a step. The leg appears shorter, and is placed, when standing, slightly under the body, and not doubled up, or standing upon the toe as is seen in cases of hock-joint disease.

Treatment.—Absolute and entire rest for a few weeks. The application of cold water cloths over the hip, taking them off at night, and applying them in the morning again. This will have to be kept up for a week, at least, so that all heat and tenderness will be removed before any irritant can be used to the parts. (Never apply hot liniments to a part already too hot and painful.) Then apply by rubbing with the hand over the part, every second day, the following: Oil of turpentine, one ounce; oil of olives, two ounces; creosote, one ounce. Mix. This will not only act as an irritant, but as a powerful sedative to the nerves of the parts, causing relief from pain, so that the animal can be made useful.

Hock, The.—This is an important joint or part of the horse, and is the seat of many diseases, causing lameness. In the majority of hind leg lameness, the hock is the true situation. This fact is not apparent to the non-professional person, as the hock, while diseased, does not swell so often as other portions of the body or legs when diseased. Bog or blood spavin and thorough-pin, a blind man can almost see. With these exceptions, hock-joint lameness, in the majority of cases, is charged to the hip or somewhere else, simply because persons fail to see any peculiarity, even when pointed out to them.

Sprain of the hock-joint is to be treated with cold water cloths, for a few days, and the application of the following, once every second day, for a week, with friction or rubbing: Oil of turpentine; oil of olives; equal parts. Mix. This is a simple, cheap, and good liniment, and will answer every purpose.

Rupture of the internal and external lateral or side ligaments of the hock-joint is occasionally seen, and is caused by a violent slip. The rupture is at once recognized by the loss of power of the horse over the leg below the joint; but can stand on the leg, as if it were sound, and there is little or no swelling—which peculiarities serve to show the difference between a broken bone of the leg and the ruptured ligaments of a joint. The cure is accomplished by absolute and entire rest, with occasional friction with the turpentine liniment, just mentioned above. Be assured of the complete union of the ligaments—which will have taken place when the horse can bend and properly use the leg—before exercise or work be exacted

Horse Fly.—This comprehends the gad or breeze fly. The spotted horse-fly. The red-tailed horse fly. This last fly deposits her eggs on the lips of the horse, and the former glues them to the hair of the legs. These various eggs are ultimately taken into the stomach, and in one year they have

become sufficiently matured that they are thrown out to the outer world to get wings, and finally fly about and propagate their kind in the same manner as the parent stock. (See Worms.)

Hydrothorax.—This is a name given to water when it accumulates in the chest. Hence, hydro, water; and thorax, the chest.

Cause.—Debility from the effects of inflammation of some of the organs within the chest.

Treatment.—Tonics to improve the general health, and medicines to draw off the water by the kidneys and bowels.

Hydrocele.—A collection of fluid in the scrotum of stallions.

Treatment.—Paint the scrotum with the tincture of iodine.

Hydrophobia.—This disease, happily, is rare, and is sometimes called *water dread* and canine rabies, from the fact that it is only generated in the dog and feline species of animals.

Cause in Horses.—Bites of the mad dog, and sometimes the bite from the common cat is capable of producing the disease.

Hysteria.—This is a disease which is sometimes seen in *mares* only.

Causes.—Irritation of the uterus, or of some of its nerves.

Symptoms.—Great excitement and incapability of standing, and it appears as if some of the bones of the back or loins were broken.

Treatment.—Give fifteen drops of the tincture of aconite root every four hours, whilst the symptom lasts. Build up the strength of the mare by the following: Sulphate of iron, three drachms; gentian root, three drachms. Mix, and give one dose every day, for a week or ten days. Give good feeding.

Inflammation.—Inflammation of the various portions or parts of body will be found treated of under the name of the organ or part affected,

Influenza.—This is a name which is properly applied to an epizootic catarrh of frequent occurrence in the spring of the year. It may appear in a very malignant form. It is very common among the horses of this country, and it is of a specific character. It is a febrile disease, and involves different organs of the body, as the liver, lungs, heart, etc. The great central system is implicated, arising from some poison in the blood, the respiratory organs being oftener involved than any others. Cerebro-spinal meningitis may be said to be a different form of influenza.

Causes,—by some atmospheric influence; some condition that cannot be found out precisely. There is some difference of opinion as to whether it is contagous or not. It is better to keep the animal away from other animals, if convenient; but what operates upon one animal may operate upon a number at the same time, Such as the epizootic, which appeared in 1872. It could not be accounted for as of a contagious form. Influenza is more

prevalent in the spring and autumn months, when animals are changing their coats; hut it may appear in an epizootic form—that is, it attacks a great many animals similarly at the same time. In 1874 and 1878 it prevailed to a great extent, and as you see it in such cases it is more severe than in ordinary circumstances. It is, in all probability, caused by some peculiar atmospheric influences which exercise an injurious effect upon the animal. This may be said to be the exciting cause, but there are many other influences which may produce the disease. Ill-ventilated stables, the animal not receiving at the same time a sufficient supply of nutritive food, may produce it, It occurs in the most severe form in larger cities and in larger stables, and especially in under-ground stables, and may attack the great nervous centers. Experience tells us that if animals are compelled to breathe bad air, and are not given sufficient exercise, they are more likely to have influenza; while one that is well exercised and well fed is not so susceptible; but all are subject to it.

Symptoms.—Vary much, and depend upon the organ or organs most affected. The early symptoms are a dull, languid appearance; eats poorly, sweats freely upon the slightest exertion; coat somewhat staring and dirty-looking; mouth hot and dry; and there may be a cough. After a short time there will be well marked symptoms. The cough is easily excited by pressure upon the throat; the bowels usually costive. The feces passed after a few days are small, dry pellets. The pulse considerably altered; generally quick, weak pulse, varying from sixty to eighty beats per minute. The dullness may be followed by more marked symptoms. The horse appears to be suffering from intense headache, and if caused to walk off, shows great signs of nervous depression, and appears so weak that you could almost throw him over. The pulse in such a case will be intermittent, showing that the poison was acting upon the nervous center, and not in the ordinary manner. In such a case the breathing organs may not be affected so much as in other cases. Cerebro-spinal meningitis may be produced in this way, so that you will have various forms of influenza. In other cases, the breathing is very much affected, which is, perhaps, more perceptible at the nostrils than at the flank; the throat sore; the bronchial tubes soon become involved, and you hear a peculiar noise. The legs and ears change in temperature very much. They may be hot, and in an hour may be the normal temperature; then, again, cold, etc. The eyes are sometimes affected, and so it is sometimes called pink eye, owing to the reddened condition of the eyes. A discharge from the nostrils is a favorable sign, if it is of a yellowish white color; but if it has a brownish red or rusty appearance, it is symptomatic of great depression. In some instances the breathing is increased, and blood is discharged from the nostrils. Pulse is changeable—a kind of false, irregular pulse, and such are very bad signs. In a great many cases the liver is functionally deranged, but there is not much organic change; in such a case there is yellowness of the

mucous membrane of the mouth, eye, etc. Influenza may terminate in enteritis and death. If the liver is affected the bowels will be quite irregular, costiveness and diarrhœa alternating. Any of the secreting glands may be more or less affected, and it may assume another form, that of a dropsical form, in which the legs, sheath, udder and eyelids may be affected; and if in the latter stages it is a bad sign, but if in the first stages, and the swelling is confined to the legs, and but slight, it is rather favorable. Unless there is great fever present, and great depression, it is rather a good symptom, but if in the latter stages, it is from debility, and is apt to soon terminate in well marked disease of the lungs and pleura. If the lungs are affected, the pulse becomes weaker and is oppressed, and in the last stages the animal stands until death. The animal usually maintains a standing position in influenza; he may lie down, and when down the breathing is increased much, but if he is in an easy position, allow him to lie, It gives great relief, unless there is danger of suffocation.

Treatment.—Give plenty of pure air, as in all such diseases, it is absolutely essential to success. Clothe the body according to the season of the year; well clothed in winter, the legs bandaged and hand-rubbed. Keep the blood in circulation as well as possible. Many people place the animal in a close stall or box, to keep him warm, but this is not a good way to apply warmth. It would be better to turn loose than to keep him in a tight box. Use rational treatment, according as the comfort of your patient demands. Support the system, and assist nature to throw off the disease, for influenza will run its course in spite of medicine. Use potash and soda. Chlorate of potash is to be preferred, in one drachm doses two or three times a day; but if there is great fever, use nitrate of potash, which is preferable. Feed well on nutritive food; give some roots, such as carrots, in winter. Great care must be exercised in feeding the horse. If you give too much food he will not be so apt to eat it as if but little was given at a time; give small amounts of any kind of food; feed from the hand, etc. Use stimulants; liquor acetate of ammonia, two ounces; sweet spirits of nitre, one ounce, two or three times a day; or give whisky, which is a valuable medicine in influenza, so also is beef tea. In severe cases you may have to restrict the diet, but not often. The secretions are impaired, and you will find benefit by getting the bowels to act by giving injections, and in very rare cases you may give a laxative; raw linseed oil is preferable to aloes. Do not attempt to force food, for it only acts as an irritant. You may use digitalis, if the breathing is difficult. You will find benefit from keeping up fomentations, if the bronchial tubes are affected, or the throat is sore, etc. Twenty drops of commercial sulphuric acid may be given occasionally in half a bucket of cold water which the horse will readily drink. Influenza is not generally very fatal; but when bleeding, purging, etc., were resorted to, the mortality was very great. If an animal shows signs of approaching convalescence, the eye clear, the pulse firmer and

slower, appetite returning, the body and limbs more of a natural temperature, etc., you may give tonic powders (which see).

Injections.—These are composed of warm water, soap, and a handful of table-salt; the water about luke-warm. The usual way to give injections, is by means of a large syringe, capable of holding a quart of the fluid. The diseases which call for injections, are the various varieties of colic. Few medicines will cure colic without the aid of injections; whereas, colic, in very many cases, can be readily cured by the injection alone. Therefore, never put much confidence in any person who undertakes to cure colic, without injections of warm water, soap and salt

Itch.—(See Mange and Skin Diseases.)

Interfering.—This name is in use when speaking of a horse hitting himself on the inside of the pastern joint, either on the hind or fore leg. Sometimes it is called cutting. It is usually done with the side of the opposite foot.

Causes.—The blacksmith is many times wrongfully blamed for want of attention or skill in shoeing the horse, because he interferes. There are cases, no doubt, where a little observation and care, on the part of the shoer, would have prevented it. It is, however, often attributable to the weakness of the horse, particularly in the spring of the year.

Treatment.—Give a few powders of iron and gentian in the feed, to restore the horse to strength. But in case the leg is bruised from interfering, poultice and treat as an ordinary sore.

Jack.—A small point on the inside of the hock-joint of the horse, affected with bone spavin.

Jaundice.—This signifies bile in the blood; biliary intoxication, tinging the membranes of the nose, mouth, etc., with a yellow color.

Treatment.—Give a moderate dose of medicine to open the bowels, then administer tonics. If in summer, give green food in small quantity, and occasionally administer stimulants.

Joint Diseases.—The diseases of the various joints in the horse, are many. Among them may be enumerated: Of spavin—bone, blood, bog and occult—four varieties, all of the hock-joint; of the patella, in the form of dislocation; of the hip, or whirl-bone joint, ulceration and sprain; of the joints of the back-bones, caries and ulceration; of the foot, coffin-joint, commonly called navicular-joint, lameness; of the pastern joints, anchylosis or stiff-joint; of the lower pastern, ring-bone; of the knee-joint, stiffness and open joint; of the point of the shoulders, ulceration and bulging out of the capsular ligament of the joint; wind galls, of almost all the joints, more

especially in the pasterns. The cause and treatment of these affections will be found under their proper heads, throughout the book.

Kidneys, Diseases of the.

INFLAMMATION OF THE KIDNEYS.—The kidneys are the great eliminators of the system, and as we cannot act so readily upon the skin in our patients, we frequently act upon the kidneys. Disease of the kidneys is often suspected where it does not exist—as in rolling, looking at the sides, showing pain, etc. These do not always indicate disease of the kidneys, but sometimes do, and what is supposed to be disease of the kidneys upon closer inspection turns out not to be. In enteritis the kidneys are affected to a certain extent.

Causes.—Exposure to cold; food possessing diuretic properties too largely; musty food of any kind which over-stimulates the kidneys and causes more or less inflammation; eating certain herbs, grasses, etc.; suppressed perspiration; also certain medicines in too large quantities—sweet spirits of nitre, rosin, nitrate of potash, etc., if too much is given, or if it is given too frequently. It is also said to result from violent exertion of any kind, especially with a heavy weight upon the back. But in most cases it is due to the food, medicines, or exposure to cold. It may terminate in softening, or enlargement, of the kidneys.

Symptoms.—More or less fever; the pulse varying from sixty to eighty; the mouth is hot and dry, more perhaps than in some cases of enteritis. There is considerable pain in the region of the kidneys, and more or less pain in the bowels of the horse; lies down and rolls, but not to the same extent as in enteritis, and does not try and lie upon the back; turns the nose to the flank, and puts it higher up; the ears perhaps alternately hot and cold; the breathing increased; frequent attempts to urinate, passes perhaps a small amount of high colored urine, which looks as if it was mixed with blood. The urine may be retained for a short time in the bladder. If the disease goes on and relief is not obtained, the symptoms change some; the pulse becomes weaker and weaker, the coat changes, the horse looks dull and stupid, and if both kidneys are affected, and their secretions arrested, this results very soon. After passing urine the pain is sometimes increased; all the secretions are more or less affected.

Treatment.—Must be energetic; a sedative is recommended. Formerly bloodletting was the remedy used, but fifteen, twenty or thirty drops of tincture of aconite is better; and give as a purgative—one quart of raw linseed oil; also injections not only to cause the bowels to act, but tepid water has good effect upon the kidneys. Clothe the body well and endeavor to induce perspiration. Slight perspiration around the flanks and shoulders is symptomatic of the disease. Apply hot cloths, mustard, etc., over the loins, and a newly flayed sheepskin is an old and good counter-irritation.

Pressure over the loins is a test for kidney disease, but is uncertain, for any thin-skinned animal will flinch from pressure here, and the kidneys are deep-seated and well protected, but it may increase the pain. After the symptoms subside some, regulate the diet and give a few doses of carbonate of soda.

HÆMATURIA, or bloody urine, is occasionally seen in horses, more frequently in cattle, and consists in a diseased state of the kidneys, from violent strains or accidents.

Calculi, or stone in the kidneys, are often found in the kidneys of horses, and cause considerable irregularity in making water.

Treatment.—Occasionally give thirty to forty drops of muriatic acid, in a bucket of cold water, to drink.

Bloody urine may be treated by warm water cloths, laid over the back or in a situation above the kidneys. Use flaxseed tea as a drink, to soothe the parts. Give no saltpetre or other medicine.

In old horses, as in old men, considerable chronic disease of the kidneys exists. Although little can be accomplished in the way of cure by medicines, a great deal can be done to soothe the parts, by soft and soothing feed and drink, such as steamed or boiled feed and flaxseed tea, cut grass and other green feed, with plenty of cold water, at all times to drink. The more fluids that go into the body, the less irritation of the bladder and kidneys.

Knuckling.—This is sometimes classed as a disease, but it is rather a symptom than a disease of itself. There may be a jerking forward of the fetlock at almost every step, or even when standing still. The joints appear prominent in front. It is much oftener seen in the hind than in the fore limbs. Hard and fast work is the exciting cause, or working young animals before they are able to stand the strain. The high feeding of colts, which are kept in the stable, is a cause, or it is sometimes the result of more or less disease in the fetlock joint.

Treatment.—If of long standing, not much can be done with it; but if it appears suddenly on a horse, it may be got rid of. Give rest; apply cold water, and afterwards blister; and if the horse is in the stable, if in the summer, turn him out to pasture for a time.

Lameness.—Lameness occurs in many ways, and from many causes, such as fractures, bruises, sprains, wounds and injuries, all of which will be found treated of, under their various names, through the book.

Lampas.—This is a name applied to a slight enlargement, swelling, or fullness of the bars of the mouth of young horses from the changes of teething. Pinching the skin of the bars with the nail of the thumb till they bleed, and rubbing in a little table salt, is much better than the brutal plan of burning the mouth with a red hot iron—the effects of which the animal

never forgets nor forgives, as is shown in any attempt to do anything about his head. And you may occasionally use an astringent, such, for instance, as a little alum dissolved in water, and applied with a sponge.

Laryngitis.—This is a disease or inflammation of the upper portion of the windpipe accompanied with fever, increased breathing and cough. The cause and treatment of this disease will be the same as for bronchitis, (which see.)

Lice.—Lice of various kinds are often the source of much trouble amongst horses kept in the vicinity of hen or chicken houses.

Symptoms.—Uneasiness, rubbing, and scratching; stamping with the feet and biting at the legs, as if something were annoying him.

Treatment.—Take of the flower of sulphur, one ounce; cold water, one pint. Mix, and apply with a hard brush to but a portion of the body at a time. If that is not effectual, get bi-chloride of mercury, thirty-two grains; cold water, one pint. Mix, and apply with a brush to a portion *only* at a time, or a piece of the body every day, till all has been gone over with the brush. This is very weak, and can do the horse no harm.

Liver.—The liver is the largest secreting gland of the body, situated within the short ribs on the right side. Its function is the secretion of bile—a yellow alkaline or soapy fluid.

Without the liver, digestion and animal heat cannot be maintained, and the waste or effete matter cannot be removed from the blood. So, therefore, when the liver is disturbed, there can be no health in the rest of the system

Inflammation of the Liver.—The horse is rarely the subject of inflammation of this organ in an acute, but more commonly in a chronic form. It is often met with from the fact of many horses being highly fed, and having nothing to do.

Symptoms.—The affected part is very obtuse. But we have a very striking analogy of this disease between man and the horse, which materially assists in forming a correct opinion as to the disease. Pain and lameness in the right shoulder are characteristic of liver disease, whether in man or horse, and have often been mistaken for and treated as the disease itself. Not less so is the peculiar yellowness of the membranes of the eyes, nose, and mouth, constituting a disease called by old horse doctors, the *yellows*.

Treatment.—Give powdered aloes, four drachms; powdered ginger root, two drachms; podophyllin, one drachm. Mix, and make into a paste with molasses, and form a ball; or crumble the mass in a little thin gruel, and drench the horse with it. Feed the horse with green and soft feed to keep his bowels open.

These measures being neglected, suppuration or an abscess will be formed, and break into the bowels, or become absorbed and produce glanders,

which is by many believed to be a prolific cause of this disease, and which is preceded by ill health and bad habit of body, terminating by a mysterious and unaccountable discharge from the nose, inasmuch as it is not accompanied with cough, and other symptoms of cold.

Locked Jaw.—This disease occurs usually after wounds of the feet, as from nails running into the feet, from wounds and fractures, and from a simple wound of a tendinous portion of the body. Locked-jaw occurring after wounds or other injuries, is called *traumatic*. And when locked-jaw takes place, as it sometimes does, without any injury or assignable cause, it is called *idiopathic* locked-jaw. Locked-jaw may be defined a spasmodic contraction of the muscles of the body, often confined to one set of muscles alone. Sometimes there is seen the same contraction in one set of muscles of the body, and the muscles of the jaw free from the cramps and not fixed at all, and depending upon the same causes that often produce fixedness of the jaw. Locked-jaw is sometimes confined to the muscles of the neck, and is then called *trismus*.

Symptoms.—The symptoms accompanying locked jaw in the horse are so well known to everybody, that little need be said about them further than that there is general stiffness and fixedness in the manner of standing, and a peculiar expression of countenance. The extended and dilated nostil, and the fixed ear, tell the fact, very plainly, that the muscles of the head and neck are beyond the control of the animal, else his jaw or mouth would not be kept closed.

Treatment.—Remove the painfully-stricken animal into a place by himself, where he will have plenty of air, and no sound nor sight to disturb him, and where no curious idler can enter. Place a bucket of cold, thin gruel where the horse can get at it, without an effort to himself to reach it. This is all the feed he will be likely enabled to take for a period of from three to sixteen days. Renew it once a day, and keep it sweet. He may be able to suck this through his teeth. Small, choice morsels of other food should also be placed within his reach, so as no opportunity be lost whereby his stomach may be filled, and his overtaxed strength be supported.

In securing the gruel or other feed, have everything at hand, so that *only* one journey will be necessary, in the twenty-four hours, to the place he is confined in. Open not the door of his house twice when once can be made to answer; thus much suffering may be avoided, and the chances of recovery enhanced. All the medicine necessary for the horse to have, will be one drachm doses, once in the twenty-four hours, of prussic acid. Great care will have to be exercised in keeping this powerful poison; and considerable judgment as to how this medicine is to be given to an animal with his jaws closed. Gently elevate the head a little to insure proper gravitation, and pour the acid into the widest part between the teeth, and hold the head steadily for a few minutes; then retire, and close the door, not a loud word being

spoken. A table or dessert spoon will answer for the purpose very well. Veterinary surgeons have an elastic tube, which is introduced into the back part of the mouth, and the acid poured down the tube.

If the animal live from three to four days, and is afforded every opportunity to eat a little, he may get well. Whatever the wounds or injuries that have given rise to the locked-jaw, they should be dressed with equal portions of olive oil and creosote, which will soothe the irritated nerves of the part. An occasional poultice of flaxseed may be necessary.

Above all things, neither bleed nor physic, as these can do no good, and will only only hasten the death of the animal by taking away whatever strength he may have, all of which will be necessary to carry him through so severe a disease.

Loss of Appetite.—This is more of a symptom than a disease, and requires for its removal the cause which gave rise to it. In cold, influenza and fever, the appetite is bad, and with their removal it will be restored. Take powdered carbonate of ammonia, and gentian root, each two drachms; mix in some cold gruel, and drench the animal twice a day. This will not only remove, in a measure, the cause, but will restore the appetite also.

Lumbago.—This is applied to a peculiar stiffness over the loins or back, partaking of the nature of rheumatism, (which see.)

Lungs.—These are the organs of breathing, and are subject to many diseases, having names familiar to every horseman.

Pneumonia, or Inflammation of the Lungs.—This is an inflammation of the substance of the lungs, and is sometimes very common in the spring after a severe winter. It may affect both or only one lung. There are several stages of the disease, and it may terminate fatally at any one of them if not properly handled.

Symptoms.—Chill followed by fever and increased for a short time, and is succeeded by cold legs and ears, quickened breathing, and wide, open nostrils, mouth hot and sticky, the breathing slightly affected. A peculiar quivering of the muscles of the side and breast will be observed in all cases of inflammation of the lungs, and will rarely deceive. The animal will eat nothing, and persistently stands with his nose and mouth in the manger; and if taken out of the stall and stable to the open air, he will almost refuse to go back again into the stable, relief being experienced from the fresh air. Hence, the necessity for plenty of fresh air in all diseases of the lungs. When the ear is applied to the side of the neck, a peculiar creaking noise is heard. Slight discharge of serous flakes or matter will be observed sticking to the sides of the nose. If this disease be not subdued or cured, it ends in abscess. To the ordinary horseman, the general aspect or appearance of the horse, when under this disease, is infinitely more important as a rule and guide in

determining the seat and nature of the disease, than any assistance they can gain from the pulse.

Cause.—Alterations and sudden changes in heat, cold, and moisture; placing the horse in a warm stable, then turning him out to pasture; clipping and then exposing to the cold without being properly blanketed. It also sometimes results from being driven while suffering from catarrh. Improperly ventilated stables are also responsible for many cases, such as standing the horse between two doors where he is exposed to a constant draft. It is more likely to occur in young horses than in old ones.

Treatment.—Place the horse in a light and airy place, and clothe him according to the weather. Bandages to the legs will, at all seasons, be necessary to keep them warm, and to that extent relieve the lungs of a portion of blood. Aconite, judiciously given, is the most powerful remedy known. Give twenty-five drops of the tincture of aconite root, in a cupful of cold water, and drench the horse. Repeat the dose every four hours, till six doses are given. In the majority of cases, one to two doses will be all that is required to effect a cure.

Pleurisy.—Inflammation of the membrane covering the lungs and lining the cavity of the chest.

Symptoms.—A rigor or chill, fever, disinclination to turn short, an occasional short painful cough, and careful breathing, accompanied with a sigh or grunt. A peculiar line will be observed in pleurisy, running from the haunch, round the belly to the breast-bone. The breathing is deep, not so short and quick as in inflammation of the lungs. In the first twenty-four hours after the attack, pain will have given way, and the horse be apparently better. This, in the majority of cases of pleurisy, when left a few hours to itself and not checked, terminates in *Hydrothorax*, (which see,) or water or serum in the chest, sometimes causing adhesions. The *favorable termination* of pleurisy is by what is called *resolution*.

Causes.—Changes in the atmosphere. Exposure to cold. Broken ribs or wounds.

Treatment.—Treat the horse as for inflammation of the lungs, by giving him pure air, cold water and aconite; followed on the second day by five grains of powdered Spanish fly in gruel, once in the twenty-four hours. To remove the fluids from the body, give, after the active stage of the disease has passed, good feeding and generous diet.

Congestion of the Lungs.—The lungs are liable to become congested, when they are overcharged with blood.

Symptoms.—The horse blows, his nostrils are very much expanded, he is heaving at the flanks, and is the picture of distress and stupidity.

Cause.—Weakness and want of power in the blood-vessels to contract and empty themselves.

Treatment.—Allow free access to cool air, clothe the body and bandage

the legs to encourage the blood to the skin and legs, and give the following mixture: Sweet spirits of nitre, half an ounce; powdered carbonate of ammonia, half an ounce; mix in a bottle of cold cruel, in the form of a drink. If those articles are not at hand, give two bottles of warm ale, or half a bottle of brandy or whiskey.

Lymphangitis.—This is a disease which attacks large coarse-bred horses that are difficult to keep in good condition, and consists in the outpouring of plastic lymph into the femoral veins of one of the fore legs, which, as a consequence, swells to a very great size, and exhibits to the touch a feeling of a great many irregular prominences under the skin. It is hot, painful, stiff, and accompanied with fever, which, in a short time, passes off. In a few days the heat, pain and swelling will diminish a little, and the horse will move more freely, but will, in most cases, retain a "thick leg" for life. Fomentations of warm water should be applied to relieve heat, tension, and pain; to be followed in a few days with broad bandages tightly rolled round the limb. Give soft feed, such as cut-mess, bran and green food. As soon as the animal can move the leg he may be put to slow work.

Mad Staggers.—An affection of the brain. (See Staggers.)

Maggots.—These are sometimes seen in neglected wounds and sores, in warm weather. To remove them, apply equal parts of creosote and olive oil.

Mange.—This is a disease of the skin, and is caused by a small mite called *acari*, which breeds and burrows in the skin. To cure mange, destroy the insect. (See Skin Diseases.)

Moon Blindness.—(See Eye Diseases.)

Mouth, Diseases of the.—These are but few; perhaps the irregularities of the teeth are the most important. So much is this the case, that from diseased or carious teeth, an affection arises, to many external appearances, similar to glanders; and horses have accordingly been destroyed, whereas, if a carious tooth, producing a stinking discharge from the nose, had been removed, these appearances would have passed off. The edges of the teeth of horses, at all ages, are apt to become sharp, and cut or wound the inside of the mouth, and interfere with mastication or chewing. When horses are off their feed and losing flesh, it will be well to have the teeth examined. To remedy any irregularity of the grinders, a rasp or file, with a concave surface and long handle, is used to make the teeth smooth and level. Wolf teeth are supernumerary, but do no injury to either the mouth or the eyes.

Scald Mouth.—Another simple affection of the mouth, which is characterized by the horse slobbering or frothing from the mouth, as if salivated. In aggravated cases fever is present.

Treatment.—Give ten drops of the tincture of aconite root in a little

cold water three times in the day, for 48 hours, and allow the horse to have a bucket of cold water placed before him, to cool his mouth in.

WOUNDS OF THE TONGUE.—Should be treated the same way, but without the aconite. If the tongue is nearly cut through, have the cut portion entirely removed. The horse can do wonderfully well without a large part of his tongue.

APHTHOUS THRUSH.—Soreness of the mouth, with white patches on the tongue, inside the cheeks and roof of the mouth.

CAUSE.—Bad condition of the stomach and dyspepsia.

TREATMENT.—Borax in powder, one ounce; mix, and apply with a soft brush, or soft piece of cloth. Give soft feed or cut grass. A few doses of sulphite of soda, half an ounce to a dose, given for a few evenings, will be all that is wanted. (See Lampas.)

The mouth is a favorite and convenient place for horsemen to try the keenness of their pocket knives, when the least pretext is offered.

The palatine artery is sometimes cut lengthwise; and when that is the case, the bleeding, thus unnecessarily induced, will not stop when it is wanted. Many plans and contrivances are recommended, by individuals, to stop such bleeding; but none are equal to a piece of iron or kitchen-poker, immersed, for a few minutes, in hot water, and applied to the wound for a moment, which will at once stop further loss of blood.

Narcotics.—Medicines which act upon the nervous system, diminishing its power and sensibility, and so relieving inflammation, irritation, and pain. A medicine capable of doing this, also contains the properties of an anodyne, a sedative, soporific, carminative, and nauseant.

There are but few medicines possessing this power over the horse, and these are, aconite, prussic acid, veratrum, and, perhaps, lobelia. In general, nothing answers the purpose so well as aconite. Indeed, so great is its power, that in bronchitis, inflammation of the lungs, feet, and bowels, or where there is pain and fever, no remedy or remedies can compare with this invaluable medicine in the treatment of diseases of the horse. (See Medicines and Prescriptions.)

Nervousness.—Few persons having the care of horses have failed to observe in them, occasionally, a peculiar excitability of disposition when any confusion and noise is going on, and when being harnessed for work. The tail becomes somewhat elevated, they move from one side of the stall to the other, and pass manure from them repeatedly every few minutes, until one would think there was nothing left in their bowels. These animals are usually light bellied and poor feeders, but [illegible] and free goers, very gay in saddle or harness, and much admired by persons not versed in horse-flesh. They make excellent Sunday horses, but poor every-day animals, as the con-

stant excitement, when at work, overdoes their physical powers. This condition impares the value of the horse very much.

Treatment.—Keep nervous horses in a place by themselves, where there is no noise or sound to disturb them, and have no harness or saddles in the place with them, nor clean harness or saddles where they are; for whenever a piece of harness is seen in the hands of the groom, the animal expects it is to be put upon him—hence he gets excited, and efforts are made to empty the bowels of their contents. The harnessing or saddling should be the last thing done before going out with such a horse, as it gives him no time to empty the bowels and become excited. Ten grains of opium, and a drachm or two of prepared chalk may be given, either half an hour before going out, or after he comes in. Such horses are more pleasant to drive, if this be given. Stuffing cotton or wool in the ears also has a good effect on a very irritable one.

Neurotomy.—An operation for dividing the nerves of feeling, as they enter the foot on both sides of the leg. The operation is performed for the purpose of removing pain from the foot in navicular disease. It has, however, of late years fallen into disrepute on account of ignorant men operating indiscriminately on feet of all forms and shapes alike—in consequence of which no surprise should have been expressed. when in some cases the feet ultimately fell off.

Neurotomy should never be performed upon flat and weak-footed horses, as they are easily bruised, and suppuration is set up, terminating in separation of the outer and inner foot structures. Weak and flat-footed horses, when sound, are careful how they put their feet upon hard roads and paved streets; but when deprived of all feeling by the operation of neurotomy, they let their feet come down on the ground with great force, so as to injure them, resulting, as before stated, in the hoof falling off.

Open Joints.—(See Broken Knees.)

Ophthalmia.—(See Eye Diseases.)

Overreach.—This is the consequence of driving faster than the horse should go. The injury is generally done by the edge of the inner rim of the shoe. Avoid the cause, and treat the wound with the simple ointment. See Prescriptions and Medicines.)

Paralysis, or Palsy.—Loss of the power of moving in some parts of the body. Paralysis may be confined to one leg or two legs; then it is called partial. When the horse has lost the power of standing, and the four legs are affected, then it is complete. Usually, however, in the horse it is confined to the hind parts, or the haunches and legs. Sometimes the paralysed part is numb, at others the sense of feeling remains.

Causes.—Disease in the brain and spinal cord.

Treatment.—If the patient is young, exercise patience and time, and nature will do a great deal in a disease of this kind. The general health is to be kept up by good feeding and tonic medicine—such as fifteen drops of the tincture of nux vomica, four times in the twenty-four hours. Turn the horse from side to side twice in the day, and give plenty of dry, clean bedding to prevent the skin from scalding and peeling off—which is sometimes a source of great irritation. The paralysed parts should be well rubbed with a stiff brush. Electricity has been regarded as an advantage in this disease, but not much need be expected from it. The nux vomica offers, with good feeding and care, the best chance for recovery.

Peritonitis.—Inflammation of the peritonium, or the serous membrane which lines the walls or inside of the belly, characterized by great pain, and is the result of accidents or injuries; in fact, it is often the result of castration, when not properly performed.

Treatment.—The same as for any disease of an exalted kind, using aconite root, cold water and pure air, and after the pain and fever have subsided, good feeding. If the bowels require it, give a little oil.

Phagadena.—A name used in surgery, implying a spreading and destructive ulcer, which spreads rapidly and destroys the surrounding parts. The true meaning of this word is *eating*, and in its effects it is similar to what is called, in domestic practice, hospital gangrene—a local, spontaneous combustion, in which oil globules are poured out in great quantity in and around the sore or ulcer. These ulcers are common on the heels and legs of horses after a severe winter. When on the heels, the ulcers are taken by horsemen to be scratches. Phagadena does not usually assume the form or appearance of a cut or scratch, but is generally a flat, round or oval, and circumscribed sore at first; the hair of the part stands on end, with oil drops all over the surface, and in a few days the whole of the skin and hair falls off, or a separation of the edges of the sore will take place, and the skin and flesh of the part will completely fall out, (called core) leaving an unhealthy looking sore, with a white fluid covering the whole of its surface. When the slough does not take place, it is gradually eaten away, and in this case leaves on the edges and surface of the sore a thin dirty colored looking skin or membrane.

Causes.—Bad habit of body, from impure blood, death of the part from exposure of the heels in some mixture of salt and snow. Cold drafts under stable doors.

Treatment.—The complete removal of all dead matter belonging to the ulcer, and a thorough cleansing of its inner surface. This is important, as it will not only be rendered necessary as a measure of cure, but as a surety against it spreading further up the leg or heels. Then sprinkle the edges and inner surface twice in the day, for a day or two, with powdered bluestone to

destroy the unhealthy surface and hasten a red surface, or the granulatory process by which the hole will be speedily filled up again. Complete the cure by sprinkling powdered loaf sugar over the sore twice in the twenty-four hours. Support the strength of the horse by good and generous diet.

Poll-Evil.—So called from its occurring in the region of the poll, is well known to horsemen, without much of a description being given. It consists in suppurative inflammation forming pus in the form of a simple abscess, or in the form of fistula, (which see.) It is not a constitutional disease, but arises from well known causes; from inflammation set up, involving the muscles of the region of the poll.

Causes.—It is usually the result of a direct or indirect injury. Some stalls are so stupidly arranged that when a horse lifts his head from the open manger he is liable to hit himself against the cover of a hay rack. Again, low doorways are responsible. Another is a bad fitting head halter or bridle, or a poke put on to prevent the horse from jumping when out at pasture, or by any foreign body that punctures the muscles thereby setting up inflammation.

Treatment.—As soon as the swelling has become a little soft, have it opened without delay, before the pus has time to burrow down among the bones of the neck, and cause disease in them. Make the opening large and deep enough, so that the abscess can be swabbed out with a piece of sponge or soft rag tied on the end of a stick, to remove the pus. This ought to be done twice a day, till no more pus can be brought out.

Syringe or squirt cold water into the sore two or three times a day, and swab it out again, till completely dry. Then apply the following, once in a day, with a swab: Creosote, one ounce; oil of olives, two ounces; oil of turpentine, one ounce; mix. In applying the mixture do not use the swab too freely, as it may break down the granulations or the healing processes that are springing up to fill the hole or cavity, and thereby prevent a perfect cure.

Polypi.—These are diseased enlargements, which grow upon the mucous membranes of the nose and ear, and in the uterus or womb of mares.

Treatment.—If they are small, they are cured by touching them with a stick of caustic potassa; if large, cut them off with a sharp knife or scissors, and apply a weak solution of blue stone to the sore till it is healed.

Predisposing Causes.—Causes which render an animal susceptible to disease. For example, a young horse standing in the stable from day to day becomes predisposed to disease of the throat and lungs, when put to any exertion. Old age is a predisposing cause of disease. Some animals, as well as men, are more disposed to disease than others. From their temperament, and certain conditions of the solids and fluids of the body, the body is more susceptible to what is called a predisposing cause.

Proud Flesh.—A common name applied to hasty granulations in a

sore or wound, which present a fungous appearance. To cure and prevent this, sprinkle a little white sugar, or powdered blue stone on the surface

Prurigo.—An itchiness of the skin, which is best treated by the sulphite of soda, in half ounce doses, given every night in cut feed, for a week. (See Skin Diseases.)

Pulse.—This is the stroke or beat of an artery, consequent upon its alternate dilation and contraction caused by the action of the heart. The pulse is subject to many variations, even not depending upon disease. It is also liable to changes from temporary excitement, as from severe heat, etc. Medicines act upon the circulation, and consequently change the beat and character of the pulse. If the disease be debility, diffusible stimulants will be required to raise the pulse; and in order to depress the circulation, as in inflammation and fever, nauseants are indicated, such as aconite, etc.

Purpura.—This is a disease which is but rarely seen, and consists in the surface of the whole body and legs being covered with pimples, or small boils, which discharge a livid or purple-colored fluid. The animal is very much debilitated; and, accompanied with sympathetic fever, we not unfrequently see swellings of the head and parts of the body, with the legs very thick, and the same colored fluid oozing out of them. Invariably the horse is scarcely able to move.

Cause.—Venous congestion of the whole surface of the body, and, possibly, a deterioration of the blood itself.

Treatment.—Support the strength, to keep off typhoid symptoms; enrich the blood, and attend to the surface sores. For this purpose, give the following powders, night and morning: Powdered sulphate of iron, three ounces; gentian root, three ounces and a half; carbonate of ammonia, four ounces. Mix, and divide into twelve powders, one to be given twice in the day. Give, occasionally, from forty to sixty drops of commercial sulphuric acid in a bucket of cold water. Feed the horse well, and apply to the sores olive oil, three ounces; and creosote, one ounce; once every second day, and wash the sores twice a week. Horses once attacked by this disease, are ever after liable to it.

Putrefaction.—Certain diseases are regarded as putrid, where the discharges have a black appearance, and putrid smell. When weakness and debility are present, putrid ulcers spread rapidly. The treatment of putrefaction, in a living animal, should be directed to laying open the sores, so as to get rid of the putrid discharge before it is absorbed into the circulation. Then wash immediately with the solution of the chloride of lime, after which dress the sores with equal parts of olive oil and creosote, and sprinkle them with powdered charcoal. Furnish the horse with good feed to support the

strength, and give sulphate of iron and gentian root, two drachms each, night and morning.

Quinsy.—A name given to sore throat. (See Distemper and Influenza.

Quittor.—This term is used in England for a disease in the foot of a fistulous character. (See Foot Diseases.)

Rabies.—(See Hydrophobia.)

Rachitis (Pronounced Racketis).—A disease of the bones of young animals, due to a deficiency of earthy matter, (lime,) which causes the bones to yield, being too soft. In colts of the first year, some will be observed to stand so close at the knees, that one joint touches the other, which gives the fore legs a curious looking twist, with the feet turned out, and the knees bent in. Colts so affected soon get well when they are supplied with good, nutritious food.

Rheumatism.—In no disease of the horse are there so many errors and mistakes committed; not only as to the nature of the affection, but its mode of treatment. Horsemen and some horse doctors have not yet learned that there is a difference between rheumatism and FOUNDER, whether acute or chronic, and how to distinguish one from the other. The difference between acute or inflammatory rheumatism and acute founder is this: In rheumatism there is not only pain, but great fever and excitement, and its seat is in the joints of the legs; in founder, we have pain, but no fever, and the disease is confined to the feet alone. (See Laminitis.)

In chronic rheumatism there may be some excuse for such mistakes, as there is no fever; but there is an inability to move, as if the horse was sprained over the loins. (See Lumbago.)

ACUTE RHEUMATISM.—Nothing else but what is called (when man is the subject,) rheumatic fever.

Symptoms.—Great fever, excitement, and irritation, with extreme pain in the legs and joints; so much so, that the stricken horse has not a leg fit to stand upon, and dares not move from the place he occupies, for fear of falling to the ground. In connection with all this disturbance, the horse sweats profusely, and blows or breathes excitedly, having no heat in the feet, as in founder. It will be well to remember this, in forming a correct opinion of the case. In severe cases, the whole of the muscles of the body are set to quivering, clearly indicating inflammatory rheumatism in full force and degree.

Causes.—Sudden check to perspiration, by placing heated horses in a current or draught of cold air, thus preventing the transudation through the skin of its formed and natural secretion, which being absorbed by the blood,

and acting as a poison, produces inflammation in the sheaths of the tendons, and of the fibrous parts or tissue.

Treatment.—The treatment of acute rheumatism is somewhat unsatisfactory; not that it is incurable, but from the fact that the medicines which frequently cure one will not cure other cases.

Give twenty-five drops of the tincture of aconite root every four hours, till six doses are given. Place the horse in a cool, airy place, with plenty of bedding under him, so as to induce him to lie down; then lightly cover the body, and apply cold water swabs or loose cloths to the legs, keeping them continually wet, from twelve to twenty-four hours. In winter, warm water will answer best. By the time the six doses of aconite have been taken, a great change for the better will have taken place; so much so, that, in many cases, the horse may be left to nature to complete the cure. But, on the other hand, should the disease take a chronic form, give drachm doses of the powdered meadow saffron seeds twice in the day, and occasional doses of sixty drops of sulphuric acid in half a bucket of cold water. Half ounce doses of the sulphite of soda may be given as an alkali. Do not bleed or purge.

Chronic Rheumatism.—There is no doubt that chronic rheumatism in a joint is one of the most prolific causes of occult or hidden lameness in horses; while this is so, when there are no swellings to point to as a proof of the correctness of your opinion, many will question your judgment. But it is with this, as with many things in the world—time only being required for a thorough development of the fact.

Treatment of Chronic Rheumatism.—Give a few doses of aconite root, followed by the colchicum or saffron seeds, the sulphuric acid and the alkaline, as is recommended in acute rheumatism, but not pushing them to such an active extent. A liniment may be applied to the rheumatic joint or joints composed of chloroform and olive oil, equal parts, to be used once a day, with friction by the hand. One part of the tincture of aconite root may, in addition, be used to advantage with the chloroform.

Rheumatism.—Accompanying Diseases of the Throat. This combination is often met with, which is due to the fact that the same serous or fibrous tissue or membrane is affected in each of the diseases. Nevertheless, we do not see cases of throat disease following rheumatism; from which we deduce the fact that those membranes are not capable of reflecting upwards and backwards their sympathy or feeling as the nerves of the body are. So, therefore, I am inclined to the belief that rheumatism in this form, is the effect of disease in the throat, and not a cause of the disease.

Treatment.—Cure the disease in the throat, and the rheumatism will be deprived of its cause and support. (See Influenza and Gastritis Mucosa.)

Ring-bone.—This is a serious affection, and consists of a circle of

bone thrown out from the underlying bone. Sometimes, in addition to this, the cartilages of the foot are converted into bone, and laid in the form of a circle; and hence its name, ring-bone. It is most common in the fore legs of heavy, coarse-bred horses, with short and straight pastern-joints. When it occurs in fine-bred horses, it is usually the hind leg which is affected. Ring-bone does not always cause lameness.

Cause.—Hereditary predisposition, from a peculiar formation of pastern-joints, which are found not well adapted to hard work; and hence, an effort of nature is set up to strengthen parts which are too weak, by converting an elastic substance into a hard and unyielding mass, and a moving hinge into a fixture.

Treatment.—If it is of recent origin, and the horse is young, much may be done in the way of a cure, by first removing all heat and inflammation with cold water cloths wrapped round the parts for three days, taking them off at night. At the end of that time, get one drachm of the bin-iodide of mercury, mix with one ounce of lard, and apply one-half of the salve by rubbing it in well for ten minutes. Tie up the horse's head for a few hours, and the next day wash off with soap and warm water, daily anointing the parts with lard or oil for a week; then apply the remainder of the salve in the same way, and proceed as before. In old horses, not much can be done with ring-bone, as the bones of old animals contain so much earthy (lime) matter that nothing can act upon it.

Ringworm.—(See Skin Diseases.)

Roaring.—A noise made by some horses when put to work. There are many different sounds produced from the same cause, and they are incurable, except when depending upon the presence of tumors, which can be removed.

Saddle Galls.—Sores produced by the saddle and other portions of the harness, and are best treated by the compound tincture of aloes. When the sores become hard and firm, like warts, use the ointment of iodide of mercury. (See Medicines and Prescriptions.) Remove the cause of the trouble by attending to the saddle and harness, and if no fault be found with the stuffing of the saddle, cut a hole in the padding sufficiently large to accommodate the sore without touching it.

Salivation.—This is an increased flow of saliva induced in the horse by mercury and other medicines, and is often seen in horses feeding upon the second crop of clover late in the fall of the year, or after slight frosts; which fact sufficiently accounts not only for the salivation of, but also affords the reason why horses so feeding lose flesh and become thin and weak, although apparently feeding upon abundance.

Second crop clover grows fast, is soft, and full of moisture, while the cool nights arrest its mush-room growth, and the moisture it contains in great quantity is converted from a sweet and nutritious substance into a sour and acidulous fluid, not unlike vinegar or acetic acid. The acid so formed within the clover leaf and stem is pressed out by the act of mastication or chewing, stimulating the fauces of the mouth and the salivary glands to a great extent and taxing the substance of the body for the saliva to meet an enormous demand. Hence, the weakness and loss of flesh of horses so fed.

Sand Cracks.—(See Foot Diseases.)

Scald Mouth.—(See Mouth Diseases.)

Scarlatina.—A disease newly discovered in light-colored horses, attended by sore throat, as in man, and with slight fever and dry skin—the glands of the neck are slightly swollen, and in about two days the lining membranes within the nose and lips become studded with scarlet spots about the size of a garden pea, which run together. In light bay horses will be seen patches from which the hair falls off and is replaced by a coat of a lighter color, thus making the animal look as if he had had an attack of varioloid or small-pox. Scarlatina is an eruptive fever, running a fixed and definite course, and is closely allied to purpura, influenza and strangle.

Treatment.—Place the horse in a cool place, and give small doses of aconite, followed by gentian and carbonate of ammonia. In a few days iron may be added. (See Medicines.)

Scratches.—(See Grease, and Frost Bites.)

Scouring.—(See Diarrhœa.)

Scurf.—A scaly eruption on the skin of badly-groomed and cared for horses. It is cured by good grooming, good feeding, and in some cases, a change in stabling.

Secretion.—The product secreted or separated from the blood. Secreted products are of two kinds:

(1.) *Excretion*, or matter separated by animal bodies, and thrown off on account of their noxious or effete qualities. Examples—the urine, the dung, the sweat, and carbonate acid gas from the lungs.

(2.) *Secretion* is matter separated from the blood for further use, and the performance of various actions in the living system. Examples—bile, saliva, etc.

Serum.—The thin, colorless fluid, which separates from the blood.

Serous Abscess.—A variety of abscess seen usually about the breast of horses. It arises from injury followed by the pouring of a serum from the

blood into the injured part, which, not being absorbed readily, remains there in the form of a large ovoid flattened bag. A blind man, who never saw a tumor, could tell that it contained fluid. Indeed, where dropsical swellings are not absorbed, a serous abscess will be formed.

Treatment.—Open it with a knife, making a large opening through the skin, only at the lowest soft part, so the serum will run out without pressing. Inject once or twice with cold water, and annoint the skin with lard to prevent it from cracking or becoming dry.

Seton.—A piece of tape placed under the skin by means of a needle, made for the purpose. Setons are rarely of use, and are often torn violently out, making an ugly sore.

Shoulder Lameness.—This is produced by a slip, or side-fall, and is frequent with horses in cities having broad rails laid on the streets for railroad purposes. In wet weather these rails are very slippery; hence the horse has no foot-hold, the leg is stretched far out before the animal and the muscles of the shoulders, and in some cases, the shoulder-joint is involved. A much more serious affair than simple shoulder sprain is the result.

Shoulder lameness is common to young horses when ploughing in the furrow.

Symptoms.—The absence of heat; tenderness, and swelling in any other part of the leg or foot. Always find out with certainty where there is no lameness, and the situation of lameness will very soon be apparent. Negative and positive symptoms should always be well considered before coming to a final conclusion, as by doing so the situation or trouble is so narrowed down that a mistake can scarcely occur. Shoulder lameness, however, is known by the horse stepping longer with the lame leg, and shorter with the sound one; and, excepting in very severe cases, the horse will not only point the leg out from the body, but carry it also to the side of the body. Now, in most sprains and diseases in the foot, the leg will be pointed straight out without any side position. Take the leg which is lame by the pastern, and gently carry, or pull it straight out from the body of the horse in front, and gently also to the outside; if it be shoulder lameness, the horse will not only show evidences of pain, but will in many cases, depending upon the spirit and animation of the horse, get up from the ground with the sound leg and endeavor to wrest the lame leg from you.

In very severe cases, when occurring from a bruise, the horse will stand on his toe, which is evidence of contusion of the shoulder.

Treatment.—Absolute and entire rest, warm water cloths applied for two days, followed by cold water cloths, in the same way, and for as many days. Then a slight blister of Spanish fly may be rubbed into the skin of the shoulder, taking care that none of it is put on at the situation of the collar, as it

would render the part a little tender for a while by friction from the collar. Take Spanish fly in powder, one drachm; hog's lard, six drachms; mix, and make an ointment, or salve, and rub the better half of it into the skin. Next day wash off with warm water (not hot), and when dry from washing, anoint the blistered parts with oil or lard, daily for a week. It is not advisable to put horses to work, or even exercise, too soon after getting well from lameness.

Shoulder-joint Lameness.—This is a more serious form of lameness than sprain of the muscles of the shoulder. It consists in the softening of the articular cartilages of the joint, with inflammation of the joint membranes, and great secretion of the unhealthy synovia, (joint oil) producing bulging of the ligaments, (capsular) and covering the joint. It can be detected by making the horse stand upon the lame limb, and by holding up the other one. This is a disease similar to spavin in the hock-joint, which accounts for the unsatisfactory results of treatment.

Symptoms.—The horse drags his toe, and throws his leg out at every movement of the limb.

Treatment.—As before stated, this is rather unsatisfactory, from the fact that the cartilages are likely to be destroyed, and the bone underneath apt to become ulcerated; but if taken in time, much good can be done. In many cases a cure can be effected by the ointment of red iodide of mercury well rubbed in once a week, for a few times.

Take of bin-iodide of mercury, two drachms; hogs lard, two ounces. Mix well on the bottom of a dinner plate, or a smooth slate, with a table knife. Of this ointment, take one-fourth and rub well into the joint, tieing up the horse's head for a few hours, to prevent his getting at the shoulder with his mouth; allow soft beddiug for the front feet to stand upon, as the horse will stamp with his foot on the floor—for the action of this ointment is considered to be as painful as the hot iron, for about half an hour from the time it begins to act till the parts commence to swell from its powerful effects. Hence, firing irons are now not much used, except in the hands of old fogies. Daily, oil or grease the parts for a week, then apply as before, and remember, that to get all the benefit of this ointment, it must be well rubbed in the parts.

Side Bones.—A species of ring-bone; only the side cartilages of the foot are converted into bone, and do not, as in ring-bone, extend round the coronet, or portion immediately above the hoof. The cause and treatment are the same as in ring-bone, (which see.)

Skeleton of the Horse, Bones of the.—The skeleton is composed of two hundred and and forty-seven separate bones, which are united by joints to form the spine, thorax, pelvis, tail, and fore and hind extremities. The spine is finished anteriorly by the head, which is divided into the cranium

and face, and contains the teeth. Suspended from the head is the os hyoides, which completes the number of bones. Thus:—

The spine consists of 7 cervical, 18 dorsal, and 6 lumbar vertebræ—Total	31
The thorax is made up of the dorsal vertebræ, with 18 ribs on each side, and the sternum in the middle—Total	37
The pelvis comprises 2 ossa innominata (or ilium, ischium, and pubes), and 1 sacrum—Total	3
The tail contains on an average 17 bones	17
The fore extremity is made up on each side of the scapula, humerus, os brachii, and 8 carpal bones, 3 metacarpal, os suffraginis, os coronæ, os pedis, os naviculare, 2 ossa sesamoidea—Total on both sides	40
The hind extremity has the femur, patella, tibia, fibula, 6 tarsal bones, 3 metatarsals, os suffraginis, os coronæ, os pedis, os naviculare, 2 ossa sesamoidea—Total	38
Bones of the cranium	10
Bones of the face and lower jaw	18
Teeth	40
Bones of the eternal ear, 4 in each organ	8
Os Hyoides, or bone of the tongue, made up of five sections	5
Grand total	247

Skin Diseases.—There are many, and apparently different varieties of skin diseases described by writers, many of which are the same, and produced by the same cause, but present different appearances in different animals, and in different stages and conditions of the affection. Where the same cause can be properly assigned in producing different diseases, although apparently dissimilar, the treatment must be the same. Thus, if the *acari* is the cause of more than one kind of skin disease, of course the treatment must be directed to the destruction or removal of this insect or mite, before a cure can be affected; so, also, with faulty assimilation or digestion, which so often gives rise to skin disease, and which must be improved and corrected before the effect, (disease,) will cease and be cured.

Baldness.—Parts of the skin of the horse become denuded of the hair, occasioned by minute or small pimples, which usually contain a fluid, and burst, or break, carrying the hair with it. They are caused by faulty digestion, and should be treated by soft feed, or fresh-cut grass. The hair will grow again.

Baldness is caused by scalds, burns, and blisters; and where the true skin is not entirely destroyed, the hair can be restored by using a weak ointment of iodine—iodine, half a drachm; hog's lard, eight drachms; mix, and apply by rubbing with the hand, once every third day, till there are evidences

of a growth of hair springing up. Gunpowder and lard have no more power in causing hair to grow, than as much lard, saltpetre, sulphur, and charcoal would have; nor is it to be compared to the iodine, because, if iodine does not restore the hair in all cases, it will certainly dye or stain the skin a dark color, which cannot be washed off; and hence, in dark-skinned horses, is of much use in removing the bare, bald-look of a white spot.

MANGE, ITCH, OR SCABS.

Cause.—An erruptive contagious disease, the result of an insect breeding and burrowing in the skin, and is called *acari*, a variety of mite or amimalcule. All classes of animals are liable to be attacked.

Symptoms.—At first, a fine crop of pustules, not at this time always seen, about the head and neck,,and under the mane. By the horse rubbing himself against whatever he can get at, the hair falls off, and exposes an angry and red-colored skin, with red points and lines, fissures, wrinkles, or scratches. After this condition, we have dryness, scruffiness, baldness, and whitening of the skin, accompanied with great itchiness.

Treatment.—The best plan for curing this disease in horses is as follows: Take fine sea-sand, such as is used by stable men for scouring steel bits, and rub the affected parts well for a few minutes. Then wash the parts well with good soap and water, after which dry them carefully. Then anoint with the following ointment: Powdered sulphur, one ounce; hogs's lard, two ounces. Mix. Or use one ounce of carbolic acid mixed in a pint of water. This plan, with either of these mixtures properly applied, will not only kill the insect, but will effect a cure. This disease has baffled many who have attempted its cure without first reaching the insect, by scouring him out of his covering, and killing him with sulphur—a highly destructive article to parasite life. It is well to clip the hair off the affected parts so as to reach the disease better.

Observe.—This disease is contagious. Stall posts, mangers, harness, combs, brushes, etc., used about the horse, should be subjected to great heat either by boiling or steaming. Trees, gates, and rubbing-posts in the field, should be washed with water, and coated with a mixture of sulphur, lime and water.

(3.) ECZEMA.—This is an affection peculiar to some horses during the summer months. By close inspection, large numbers of minute elevations, or raised parts, closely joining each other, and filled with a watery fluid, will be observed; the skin will soon present a red and angry look, the hair be short and dry, accompanied with extreme itchiness—so much so, sometimes, that horses so affected become almost unmanageable. The situation of this disease is usually in the hind legs, and is considered hereditary. At all events, when a horse is once attacked by it, it is liable to return again with the warm weather.

Cause.—A peculiar condition of the blood, developed by heat.

Treatment.—This disease has not only been cured, but also prevented

from returning, by the administering of half ounce doses of the sulphite of soda, for two weeks previous to the hot weather, once a day. In addition to this; a few bundles of fresh grass. The soda, designed to neutralize, ferments in the blood; and the fresh cut grass to assist, by its action on the stomach and bowels, and ultimately upon the blood itself. Or when the disease is fairly started, use corrosive sublimate, two drachms; spirits of wine, four drachms; water, one pint; rub well into the parts, and as well as doing this, it is advisable to give internal remedies. Give nitrate of potash, or hyposulphite of soda one-half ounce, once or twice a day, until two or three doses have been taken; and use, externally, carbolic acid, one part to sixteen of water. Another is turpentine. Use turpentine and sulphur; they will increase the irritation where applied, but will soon produce a beneficial result. Clipping the hair nicely will do good. Finley Dun gives, as his favorite treatment, a compound tincture of iodine, made by shaking together two parts iodine and one part of iodide of potassium, with six or eight parts of water.

(4.) SURFEIT.—A disease making its appearance in the spring of the year in fat horses that are short and well built. It is characterized by tumors about the size of a grain of Indian corn, covering the whole body as completely as the nettle-rash does that of children, and does not generally cause itching, nor is it, like some skin diseases, contagious.

Cause.—Robust stamina.

Treatment.—Give soft or slop feed composed of bran, cut hay, cold water, and salt, for a few days. Give grass, if it can be had, without any additional feed. A few doses of the sulphite of soda will be of advantage.

Bleeding and purging have arrested the tumors in their growth, but unfortunately they become permanent fixtures, only to be removed by calomel and opium, which cause their absorption. In this event take calomel, thirty grains; opium, ten grains; mix, and give once a day, for a week or ten days. Good feeding will have to be given.

RINGWORM.—*Porrigo*, and *Favus*, are names given to this disease.

Symptoms.—Small circular patches, or scales, sometimes running together, forming large crusts and ulcers under them, in which insects breed. The microscope has shown the presence of fungi in the scab of ringworm, but whether it be merely the effect of the disease, or otherwise, is not at present known. It is, however, more likely to be the cause.

Treatment.—Wash and keep the parts clean, and aim at destroying the fungi. For this purpose remove the scab as soon as formed, and apply a solution of oxalic acid to the surface, using fifteen grains of the acid to an ounce of water. Tar ointment, creosote, sulphur, and mercury, have all been tried; but none of these meet with so much success as the solution of oxalic acid, just recommended.

Slobbering.—This is traceable in horses to a variety of causes. We

may enumerate large doses of aconite, or veratrum; also, sore, or scald mouth, and in some cases, poisoning. Slobbering from eating second crop clover, will be found treated of under the article SALIVATION.

Slough.—The separation of a diseased or dead part from the healthy portion. A slough may be of greater or less thickness, and may include the skin and flesh to a considerable depth—as from the centre of an abscess. (See Gangrene and Mortification.)

Sores.—Healthy and unhealthy sores occur in, or on, all parts of the body of the horse. Healthy sores are best treated by the tincture of aloes, or myrrh, or simple ointment. (See Medicines and Prescriptions.) Unhealthy sores should be treated, first, by the application of some caustic, or powdered blue stone, nitrate of silver, or caustic potassa, which will make an unhealthy sore a simple and healthy one. To be treated as the above.

SORE MOUTH. (See Mouth Diseases.)

SORE FOOT. (See Foot Diseases.)

SORE THROAT. (See Catarrh, Cold, and Bronchitis.)

SORE BACK. Re-stuff the saddle, and apply the tincture of aloes or myrrh.

SORE SHOULDERS. See to the collar, and apply as in sore back.

SORE NECK.—A variety of this disease presents itself about the place where the collar usually rests, and presses when descending a hill in double team work. They are very troublesome, and difficult to heal, if the horse is kept at work, and cause great irritation and uneasiness. Frequently, when the hand is laid upon it, the horse, if he be a spirited animal, will plunge in the stall, and even kick, however quiet he may be at other times.

Treatment.—Apply simple ointment, and place a firm, but strong piece of leather over it, so that the collar, when put on, can rest upon and slide over it, instead of upon the mane and neck.

Soundness—This is when a horse has nothing about him, that does or is likely to interfere with his feeding, working, and general usefulness.

Spavin.—A variety of disease affecting the hock-joint. Spavin is not now looked upon as in the days of Oliver Goldsmith and William Shakspeare, because in the minds of those distinguished men, and of some of their readers of the present time, spavin is an enormous enlargement of the hock of the horse; whereas, in some of the worst forms of spavin, there is no enlargement at all, while the hock-joint is completely destroyed, stiff, or anchylosed. Shakespeare thus refers to Petruchio's horse:—"His horse hipped with an old mothy saddle, the stirrups of no kindred: besides possessed with the glanders, and, like to mose to the chine, troubled with the lampas, infected with the fashions, full of wind galls, sped with spavins, raied with the

yellows, past cure of the fives, stark spoiled with the staggers, begnawn with the bots, swayed in the back, and shoulder shotten, ne'er legged before, and with a half-checked bit, and a head stall of sheep's leather."

Bog Spavin.—This kind of spavin is situated in front of the hock-joint, and is a soft, fluctuating swelling, which rarely ever causes lameness. It is merely an enlargement or distention of the bursal cavity of the joint, but increased in quantity, and possibly, in some cases, a little changed in quality also.

Blood Spavin.—This is the same as bog spavin, but more extensive, and generally involving the hock-joint on its three sides, front, inside, and outside, and giving to the limb a thick, rounded appearance, called thoroughpin, (which see.) The swelling is soft and fluctuating, and indeed there is no perceptible difference in the nature and result of this form of spavin, and beyond its being more extensive, interfering, perhaps, with the flow of blood in the sub-cutaneous (under the skin) vein, which is seen in front, and partly to the side of the joint, adding very little to the general swelling.

Causes.—Hard work and fast driving, especially when horses are young.

Treatment.—The application of the ointment of red iodide of mercury, in the hands of some, has done much good; but the enlargement is apt to return when the horse is again put to work, from the fact that more joint-oil, or fluid is poured out. Acupuncturation, or forcing small steel instruments into the swelling to let out the fluid, is sometimes resorted to, after which a bandage or truss is fitted to the part to press out the fluid that remains, and to cause the adhesion of the parts together. The difficulty in curing soft spavin, is the danger of opening into a cavity or joint containing oil (syoniva). An old way of treating such disease, is by striking the parts with a mallet, so as to break the skin, that the fluid can escape; the blow given to the skin being so great as to set up adhesive inflammation, and a closure of the opening, but such treatment is not advisable.

Bone Spavin.—Consists in the sprouting of the irregular bony matter from the bones of the joint, preventing their smooth and proper action over one another, and causing lameness. This bony growth sometimes attains a good size, and in some cases we find one or two of the bones only involved; in others nearly all of them are affected. The situation of bone spavin is on the inside, and in front of the joint.

Symptoms.—When horses are what is called breeding bone spavin, ordinarily persons think and say the lameness is in the hip, (see Hock) from the action which is reflected by the muscles of the hip at every movement made by the hock-joint, and from the fact that there is no enlargement as yet in the joint. The horse is lame on starting, but gets better after a little while, and after standing will start lame again. In the stable, he shifts

one hind leg after another, and when resting the lame leg, he stands on the toe. Pain and lameness cease when the joint is consolidated, although remaining a little stiff.

Occult Spavin.—This is a disease similar to bone spavin, the difference being that there is no enlargement of the joint whatever, although the bones of the joint are all diseased, immovable and stiff. This seems to puzzle and perplex horsemen, because they cannot comprehend a lame spavin without an enlargement of the joint outside; and, consequently, the poor horse is sometimes blistered and tormented in every part of the leg, but the right place. The cause, results, and effects of this disease are the same as in bone spavin, excepting that there is no enlargement.

Treatment.—For the two varieties of spavin, just described, the treatment should be the same. In young horses, the red iodide of mercury in ointment, is the proper treatment. One drachm of bin-iodide of mercury, and one ounce of lard. Mix, and apply once in a week, and lard the parts once a day, till the next application.

Old horses should have a linament applied, once every second day, to the parts. Oil of olives, two ounces; oil of turpentine, one ounce; creosote, one ounce; mix. This will relieve the pain, and to a great degree the lameness. Spavined horses should have an extra allowance of feed to keep them in condition equal to their more healthy and fortunate neighbors.

Specks on the Eye.—(See Eye Diseases.)

Speedy Cut.—This is an injury to the knee from the shoe of the opposite fore-foot, and is prevented by driving slower, and nailing the shoe on one side only.

Treatment.—Apply cold water cloths, and if the swelling does not all go away, follow with the application of the red iodide of mercury, in the form of an ointment, once a week, for a few times, and lard or grease the parts till the next application. Boots are sometimes used as a preventative.

Spleen Diseases.—The diseases of this organ are obscure, and chiefly consists of enlargements, tubercles, softening, rupture, and tumors. The symptoms attending these affections are not well marked.

Splint.—A small bony enlargement, situated usually on the inside of the fore-legs, about midway between the knee and the pastern joint. When a splint begins to grow, it sometimes produces lameness by stretching the covering of the bone, which, however, soon accommodates itself to the altered structure.

Cause.—Working horses when too young, and before the leg and splint bone have become united. Hence, splints disappear when the horse grows older, and the unity of these bones takes place.

Treatment.—One or two applications of this ointment: Red iodide of mercury, or tincture of Spanish fly, one ounce; oil of croton, twenty drops. Mix, and apply with rubbing.

Sprains.—By this is meant partial displacement; the twisting of a joint with more or less injury to the articulations, ligaments, tendons and their sheaths. At times small portions of the bones of the joint are separated. Indeed, every variety and degree of severity is to be seen in sprains of different parts. Every joint is liable to sprain, but the usual or more common sprains will be found in the pastern or fetlock joint, shoulder and its joint, hock, stifle, back and loins, flexor tendon, suspensory ligaments, etc., produced by a common cause, such as slipping, falling, overwork, the weight of the body, and not unfrequently the load falling upon a part, when not in its proper position for receiving it.

Symptoms.—Pain, heat, swelling, tenderness and lameness, more or less severe, depending on the severity of the sprain, and the part affected. In severe sprains, care must be taken to guard against mistakes, and to form a correct judgment of the nature of the injury, whether it be a real or simple sprain, or whether there be fracture or dislocation.

Treatment.—Absolute and entire rest, is the principal point to be attended to in the cure of sprains, for a sprain cannot be cured without rest, no matter what other remedies are employed; and, if there be much fever and excitement about the horse, a few doses of aconite will have to be given. Tincture of aconite root, fifteen drops, given three times in the day for two days, will remove fever and irritation. Then apply warm water cloths for three days, followed by cold water cloths for the same length of time, taking the cloths off at night, as it is necessary that water must be poured on the cloths every hour, or before the warm ones become cold, and the cold ones become warm. After which, the lameness and swelling will have ceased; or should this not be the case, apply for a few days, once a day, the following liniment: Creosote, one ounce; oil of turpentine, one ounce; oil of olives two ounces; mix. Be assured the horse is quite well before he is put to work again, as many joint diseases are brought on by mismanaged sprains, which never can be cured.

Staggers.—A disease familiar to every horseman, and of a serious character. It presents different symptoms in different horses, depending altogether upon the extent to which the brain and nervous centres are affected, and whether the variety be mad, grass, stomach, or sleepy staggers.

(1.) Stomach Staggers.—This is an attack of acute indigestion, from overloading the stomach; digestion is arrested, fermentation is set up, and the evolution or giving off of carbonic acid gas distends the stomach and bowels, and presses on the space allotted for the lungs to play in, depriving

them of ærating the blood, thereby affecting the healthy action of the brain and nerve centres, and producing death in from twelve to twenty hours.

Treatment.—Injections of warm water and soap, and a handful of salt to clean out the bowels, so that the gas can have free passage. Arrest fermentation by dissolving two ounces of the sulphite of soda in a little water, and giving it at one dose, the dose to be repeated every hour. Mix eight drachms of powdered aloes in a little warm water, and drench the horse with it to stimulate digestion, and open the bowels.

(2.) Grass or Sleepy Staggers.—A chronic variety of stomach staggers, and should be treated as the above variety.

(3.) Mad Staggers.—This is inflammation of the brain, and is sometimes called *Phrenitis*.

Symptoms.—Dullness, followed by excitement and madness. The sleepy stage, or the congestive period passing off, then the madness is seen. The horse unconsciously throws and dashes himself about, and sometimes endeavors to climb up the wall. At times, ropes will have to be used to keep him from pulling back, and becoming unmanageable, thereby destroying harness, carriages, sometimes other horses, and even the stable itself. The power of a mad horse is great, and a painful sight to see. Finally he becomes exhausted falls and dies.

Treatment.—The horse is not worth saving, and rarely can be saved; for nothing can, or will, give relief to a mad horse, but bleeding, and this to so great an extent that life does not rally, and the horse dies.

Staked.—An accident to some portion of the body, but most frequently to the belly, occasioned by leaping fences, or it may be by the horn of an ox, cow, or bull.

Treatment.—If the injury be at the belly, the wound having entered it to some depth, ascertain, with the finger, whether any portion of the bowels is injured, or has escaped through the opening. If so, and part of them be torn, sew with small, fine cat-gut, (such as is frequently used by fishermen who employ artificial flies as bait,) and pass the bowel or intestine into its proper place. If the skin is only wounded, treat it as for simple sore. If the wound is in a fleshy part, and the skin peeled or torn from the flesh, it had better be clipped off, as it will not unite again, but shrink and dry up; hence, it is neither advisable to let it hang, nor attempt to sew it. Trim off the fragments of loose skin, and treat the wound with a weak solution of blue stone, chloride, or sulphate of zinc.

Stings from Bees, Hornets, etc.—Not unfrequently we hear of horses losing their lives from irritation and fever, originating from the stings of these insects.

Treatment.—Take acetic acid No. 8, four ounces; powdered camphor, one ounce; mix, and dissolve, then rub a portion of the mixture into the

parts most affected. The poison, swelling, irritation, etc., will be at once arrested. In an hour afterwards, anoint the parts with sweet oil or lard. As acetic acid may not be at hand in an emergency like this, strong table, or white wine vinegar should be used, without the camphor. Acetic acid of French manufacture is eight times stronger than ordinary vinegar.

Strains.—(See Sprains.)

Strangles.—This is an eruptive fever, characterized by swelling in and between the bones of the lower jaw, terminating in an abscess.

It is a very common disease among Canadian and American horses. It is called strangles from a peculiar suffocating breathing. It is an eruptive fever peculiar to the horse, and generally attacks him when young, from two to four or six years old, but may be found in older horses. Some call it a catarrhal disease. It shows itself by affecting the organs of respiration more or less, and the formation of a tumor under the jaw. It is hard and small at first, but gradually enlarges and suppurates. This tumor may form in other parts of the body, on the point of the shoulder, in the groin, etc., and when it takes on this form it is called irregular strangles. Most horses have it while young, but some escape it. Some say it is contagious, others say it is not, but many animals in the same stable become affected at the same time. However, the same influence acts upon each of them. Some say it can be produced by inoculation, but there is not conclusive evidence. It is said to attack the same animal but once, but there are some cases that show that it may be taken a second time. It may and does occur at any season of the year, but is more likely to be prevalent in the spring and summer, and is likely to attack those animals that have been running out all winter.

Symptoms are very often similar to catarrh. The animal is dull and languid, and a small amount of work fatigues him. The attack is not very sudden; by and by there is a swelling; the animal keeps his head in a peculiar position; saliva issues from the mouth; the pulse is slightly affected, which you can detect by close examination. The bowels costive, the coat staring, and it is hard to tell at this stage whether it is strangles or laryngitis, but it will soon show itself by a tumor under the jaw. It may interfere with respiration; the tumor will break and discharge, or you may disperse it by absorption, but it is better to allow it to discharge externally. The tumor may be the first thing that makes its appearance, but you have more or less fever, even if it is not noticed. There is generally a considerable discharge of matter from the nostrils, and there may be symptoms of suffocation. These symptoms may not be in proportion to the size of the tumor, but if affected with strangles and influenza at the same time, there will be severe symptoms of suffocation, and death may result. It usually runs its course in from six to twelve days, and in about twenty days the horse usually resumes

his work. Some continue their work during the attack, but it is not best. You may have these symptoms, except the tumor in the throat, and by and by a swelling will appear on the shoulder or in the groin, and there may be a discharge from the nose. The tumor is generally the result of the fever; if this tumor forms upon the shoulder close to the trachea, it must be carefully watched, for it may burst internally, and cause death. In some cases the horse becomes greatly emaciated; becomes a mere skeleton, so to speak. Tumors may be in the chest or abdominal cavity, producing slight abdominal pain or colicky pain, and such cases generally terminate fatally.

Treatment.—It is generally satisfactory to treat. The disease should be allowed to run its course. It must not be checked, for that would be attended with great danger. Give pure air, and clothe the body according to the season of the year. Give good food, such as easily digested—boiled food, if it will be taken, but if not, then give the ordinary food. It is a disease that does not require any great amount of medicine. In the first stages, give a few doses of chlorate or nitrate of potash, but not so freely as in influenza, as there is danger of acting too freely on the kidneys. Good feeding hastens the formation of the abscess. If the breathing is not much affected, it is not necessary to apply any external treatment. In some cases it is necessary to use a mild external application or counter irritant, but if it is a pure case of strangles, the pulse not very high, use a mild liniment. In connection with the above treatment, and if in the summer time, use a poultice, and if there are no violent symptoms, allow the abscess to form pretty well, and do not open too soon. After you have opened the abscess, give tonics and bathe the abscess with tepid water. You will sometimes meet with a more serious case, in which the animal is breathing hard and the abscess does not form soon enough. In such a case blister, and then use poultices. In winter, treat with hot wool, just to keep the parts well warmed. You will find benefit from judicious steaming with hot water, but be warned against using a close nose-bag, for you are in danger of suffocating the animal; but keep up fomentation for some time. It may be necessary in this case to open the abscess much sooner than in the former case.

Results of strangles, or absorption of pus, pyaemia, or abscesses forming in many parts of the body. This may take place in connection with a wound just the same as in strangles. It is purulent deposits in any part of the body. The tumor may extend up to the ear, or down even to the leg. Keep the animal away from cows; give pure air. There is no specific for strangles. It is sometimes necessary to give a light laxative, which is the exception and not the rule; but it is necessary in most cases to give injections. It is seen more in some countries than in others. It is not seen so much in well-bred horses as in ill-bred horses. The Arabian breed are especially exempt from this disease.

Stranguary.—This is a name given to the urine, when mixed with blood, and when pain is present while the horse is urinating.

Cause.—Irritation of the bladder or kidneys, or both, from the use of Spanish fly, either in the form of a blister, being too extensive, or too near the loins and kidneys; also from the fly being given in an improper manner, or in too large doses.

Symptoms.—Frequent desire to pass urine, which when passed, is in small quantities, and bloody. Pain, irritation, and fever, are present.

Treatment.—To remove the pain give twenty drops of the tincture of aconite root every three hours, together with plenty of cold water to drink; also flaxseed tea, to horn, or drench down the throat of the horse, and sheath the parts from irritating substances. Take equal parts of good mustard and flour, mix with warm water, make into a soft paste, and lay over the region of the kidneys, or small of the back, occasionally moistening it with warm water, and covering it with a dry cotten or linen cloth.

Stringhalt.—This is an affection of the hind leg, and is known from the peculiar way in which the hind leg or legs are raised from the ground—a quick, spasmodic jerk.

Causes.—These are two fold. First.—The loss of nervous influence, whereby the *extensor pedis* muscle—and possibly some others—is deprived of its proper power. Second.—The peculiar anatomical articulation and general structure of the hock-joint of the horse are such that when the leg of a dead horse is stripped of its muscles the ligaments are not disturbed at all; and if the legs above and below the hock be caught hold of by the hands, and the leg straightened out, the moment the hands are taken from it, it will spring into a bent position, thereby imitating stringhalt, as near as can be. Thus the balance of power is not equal; the articulary ligaments of the hock are stronger than the muscles of the thigh. Hence, the moment the horse lifts his from the ground, the leg is snatched up by the power of the articulating ligaments.

Treatment.—Restore the lost nervous influence; thereby the muscles of the thigh are to be brought into healthy action. This will best be done by good feeding, and one grain of strychnia nux vomica given daily for six weeks, in the horse's feed, but when it is once fairly established this disease is incurable.

Sunstroke.—Coup de Soleil.—This disease of late years has become of such frequent occurrence, that it demands notice from us. The chief symptoms are exhaustion and stupidity, the animal usually falling to the ground and being unable to go further.

To prevent it, allow the horse at short intervals a few mouthfuls of water, and fasten a wet sponge over the forehead. The sun-shades now used by extensive owners of horses, will go very far in lessening the occurrence of this affection.

The following treatment, when attended to at once, in the majority of cases, will prove effectual.

First,—Remove the horse from the harness to a cool, shady place. Second.—Give two ounces of sulphuric ether; twenty drops of the tincture of aconite root, and a bottle of ale or porter as a drench to sustain the vital powers, and to act as a powerful stimulant in equalizing the circulation throughout the body; whilst, Thirdly: Chopped ice should be placed in a coarse towel, cloth or bag, cloths soaked in cold water should be laid between the ears and over the forehead, secured in any way the ingenuity of the person in charge may suggest. If the legs be cold, bandages will be of advantage. Do not put the horse to work again until he is completely restored. Dumbness is the usual result of sun-stroke—a species of coma—for which there is no cure.

Suppuration.—This signifies the secretion of pus, and is one of the terminations of inflammation.

Symptoms.—Whenever suppuration is going on to any extent in or on the body of the horse, a shivering fit, similar to a chill, will, or may be seen, followed in a day or so, either by the discharge of a yellow pus from the nose, or the formation of an abscess on some portion of the body. Suspect suppuration when rigors and shivering occur, especially after accidents of whatever kind.

Treatment.—*First.* Support the strength of the horse by good feeding, whereby the process will soon be over, and without any complication with it. *Second.* Do not physic or bleed, fsr these measures would prevent the process of suppuration from going on in its original place, and, perhaps, drive it to another.

Surfeit.—(See Skin Diseases.)

Swelled Legs.—(See Grease, Sprains, Dropsy, etc.)

Swellings.—These are of different kinds.—the hard, inflammatory swelling caused by injury, suppuration and diseased bone; the soft, and fluctuating swelling, which is generally circumscribed, and seen in diseases of the joints, as blood spavin, etc., and contain joint oil; the dropsical, or soft and *non*-inflammatory swelling of many and different parts of the body, at one and the same time. Each must be treated according to the cause of the swelling. (See Farcy.)

Sweeny.—Sweeny, or shoulder slip, is a common occurrence. It is often called shoulder slip because there is a bulging or slipping out of the joint. There is injury to the muscles in some way or other; a sprain, compression, or a jar setting up inflammatory action, perhaps not severe, but interfering with nutrition, and the muscles become wasted.

Causes—Are various. It is most likely to occur in young animals. It may arise from a sudden jerk from a plow striking a stump or stone, or from the wheel of a wagon striking against some obstacle, or it may occur from the animal jumping or rolling about; but in the majority of cases it is the result of work.

Symptoms—Are well marked. In the early stages there is more or less swelling, even though it may not be of sufficient extent to attract much notice. The first thing generally noticed is the wasting of the muscles, or the animal may be stiff to a certain extent, the action be somewhat impaired, yet you could not call it out-and-out lameness; but in six or eight days the true character of the disease shews itself. If the outer muscles are severely affected, those on the inside of the shoulder are affected to some extent, and when the animal throws his weight upon the limb, the joint bulges out until you would think there wrs a partial dislocation of the shoulder. In the very worst cases a cure may be affected, but if kept at work it may be a long time before the muscles will attain their natural size. Keep the patient quiet for two, three, or four weeks, turned loose in a box or big stall; it is better than turning out to pasture. First, use fomentations, and follow by mild, stimulating liniments, as tincture of camphor, opium, and arnica, equal parts. The whole treatment should be directed to hastening the reproduction of the muscular fibre. Feed moderately well on good nourishing feed. Judicious exercise, after some time, is beneficial.

Sympathy.—That condition which is developed in one part of the system or body of an animal, although not of itself a disease, but is the result of disease or accident happening to some other, or remote portion of the body. This sympathy is communicated through and by the nervous system. A nail in the foot, or a broken bone, is immediately followed by sympathetic fever, and general disturbance of the whole system. Herein lies the great difference between animal and vegetable life. A branch of a bush or a tree can be lopped off without any disturbance to the life or health of the main trunk. No such immunity exists in the animal creation.

Synovia.—A clear, colorless and viscid fluid, secreted by the lining membrane of the joints, for the purpose of preventing friction, and allowing an easy motion of the heads of the bones over one another. Synovia sometimes changes in quality, becomes thinner, and gives rise to swellings of the joints. (See Blood and Bog Spavin.)

Tetanus.—(See Locked-Jaw.)

Tetter.—(See Skin Diseases.)

Thick Wind.—(See Heaves).

Thick Leg.—(See Grease and Farcy.)

Thiselo.—(See Fistula.)

Thoroughpin.—An affection of the hock-joint, accompanying bog and blood spavin, characterized by soft, fluctuating swellings, containing fluid or joint oil in increased quantity, and an altered quality.

Causes.—It may be due to irritation set up through bog spavin; and in a majority of cases of bog spavin you will find thoroughpin exists. It is most frequent in heavy horses. It may attain a considerable size and does not often produce lameness unless irritation is set up; a long, straight hock, especially in a heavy horse, predisposes to it.

Treatment.—Is much the same as in wind-galls. Rest the animal to a certain extent; use hot or cold applications—cold preferable, counter-irritation, and in some cases, puncture. The best time to treat such cases is in the fall of the year. You can only use such remedies as will tend to cause absorption, as in spavin.

Thread Worms.—(See Worms.)

Throat Diseases.—(See Bronchitis, etc.)

Thrush.—(See Foot Diseases.)

Thumps.—This is spasm of the diaphragm, or the curtain which hangs down and separates the cavity of the abdomen, or the belly from the chest.

Cause.—Over driving and oppression, paralyzing the accessory nerve, and hence the flapping of the diaphragm.

Treatment.—Place the horse in a cool, airy place, and allow him plenty of cold water, and if the noise, after an hour or so, does not subside, give two bottles of ale or porter as a drench.

Tonics.—(See Medicines and Prescriptions.)

Tracheotomy.—An operation to open the windpipe, in cases of closing of that tube by tumor, or thickening of its membrane. It is an operation rarely required, and moreover, not to be attempted by a non-professional person not acquainted with the art and science of surgery.

Transfusion.—This is the act or operation of transferring the blood of one living animal into the system of another by means of a tube. Mr. James Farrel, of Dublin, Ireland, was the first veterinarian who employed tranfusion to any extent, and to excellent advantage. In cases of debility from blood letting, he has done wonders with it, and has conclusively proved to his countrymen the danger of bleeding horses to cure or prevent diseases. For, in such cases as had not been bled, he had no trouble; but in those which had been bled before he was called to them, every one died. Hence, he resorted to transfusion, in order to save others that had been treated by bleeding. The effect of transfusion is almost instantaneous.

Tread.—(See Foot Diseases.)

Trepanning.—This is an operation for opening into the bones of the head or face to elevate or raise a portion of bone which from accident has been depressed or fractured. The instrument used for this purpose is called a Trephine.

Tubercles.—(See Glanders.)

Tumors.—Tumors may be defined as circumscribed swellings of different sizes, without inflammation, and differing from one another according to their situation and their nature.

(1.) ENCYSTED TUMORS.—This is a variety of tumors often seen about the side of the nose of the horse. It is about the size of a pullet's egg, soft, and elastic to the touch, with no heat, inflammation, or soreness of any kind.

Cause.—Closing of the fatty openings of the part. Hence the elevation, swelling, and filling up of that portion of the skin which contains the suet-like matter.

Treatment.—Open the part with a knife, and inject for a few times into the inside of the tumor a teaspoonful of the tincture of iodide, to kill the walls of the tumor. The surgeon sometimes cuts these tumors out, in the form of a soft ball, without opening them. This requires a steady hand.

(2.) ENCEPHALOID.—This term means a brain-like tumor, so named from its structure being like that of the brain. It is one of the kinds of cancer which sometimes attack a horse, but is more frequently seen in the dog and ox.

Cause.—A specific poison in the blood, not as yet well understood.

Symptoms.—It is solid, hard, irregular in shape, and knotty, with no hair upon its surface, and presenting a smooth and shining aspect. These tumors grow rapidly, and finally break on the top, presenting an angry and malignant sore or ulcer, which cannot be healed without first removing the entire tumor, with a knife, and treating it as for a simple sore.

(3.) FIBROMA.—This is a fibrous or warty-like tumor, familiar to most persons, and is attached chiefly to the skin only. It is troublesome only in so far as it is apt to bleed, thereby keeping up a degree of irritation—especially in warm weather, because of the sweat and the flies.

Treatment.—Those persons who have not sufficient nerve to cut them off with the knife, can take arsenic, one drachm; hog's lard, four drachms; mix, and make an ointment; rubbing in and around the tumor, once a week, a small portion of the salve. In a short time it will fall off.

(4.) FATTY TUMOR.—This is a variety of tumor of frequent occurrence in horses, and is composed of fat, as its name indicates.

Symptoms.—A round, ovoid shape, with a firm feel, but not hard nor elastic, or at least not so much so as the encysted form.

Treatment.—Take a sharp knife, and after getting a twitch upon the

horse's nose, and one of the fore legs held up, make a straight cut over the centre of the tumor through the skin only. Then roll out the ball of fat with the fingers; the knife here is of no use.

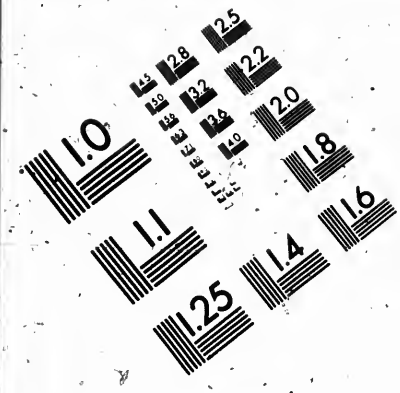
Tympanitis.—This [illegible] means drum-belly, such as occurs in cases of flatulent colic, (which see.)

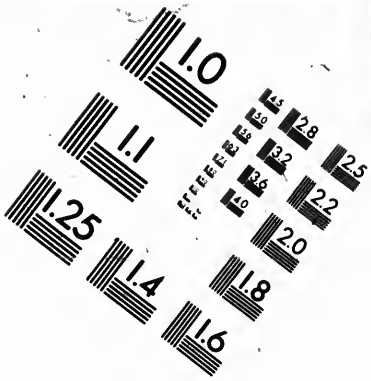
Typia—Typhinia—Typhus.—These are continued fevers, and are lit up and fed by matter in the system which is generated when horses are badly fed and crowded together in an inadequate supply of air. The fevers of glanders, farcy and pyemia are good examples. The seeds of the disease can only be got rid of by the effectual destruction of the typhinia—its existing ferment or leaven. [See Glanders.]

Typhoid.—A low form of disease, accompanied with fever. Example, Influenza, or catarrhal fever. (See Influenza.)

Typhosus.—Cerebro-Spinal Meningitis.—This disease is more extensive now than it was some years ago. It is congestion, followed by more or less inflammatory action of the coverings of the spinal cord and brain, due to a congested state of the blood vessels. This appears to be a comparatively new disease, and is found principally on this continent. It does occur in other places, but not so frequently. The sympathetic system is involved and implicated to some extent, perhaps from some noxious conditions in the blood. It generally appears to the greatest extent in those that are breathing impure air and using improper food. Soldiers established in barracks are more subject. It is generally met with in horses in large cities, where they are crowded together to a great extent. Anything that is debilitating tends to produce it. It is more severe and fatal in crowded stables. Some say it attacks healthy horses as well as those in poor condition. If this be so, then it is due to atmospheric influence. It is difficult to say what is the exciting cause. It may be due to atmospheric influence, local causes, vegetable poisons, grass containing narcotic properties, etc., affecting the cerebro-spinal nerves, and sympathetic as well. It appears in various forms, and the

Symptoms—Vary according to the parts affected. Some show the spine affected, and others the brain. Sometimes it shows itself by loss of power, especially of the hind extremities. The appetite is impaired, or completely gone. An animal may be in apparently good health, and in twenty-four hours will present the above symptoms. The temperature does not vary to any great extent; in some it is increased, in others decreased. The tremors or spasms show themselves in different parts. In the early stage the pulse is not accelerated generally, but may be even slower than natural. In other cases there will a peculiar involuntary jerking; the animal reels about, and in some severe cases falls or lies down, and is unable to rise; the bowels are usually costive; urine of a brownish color, and retained in the bladder. As





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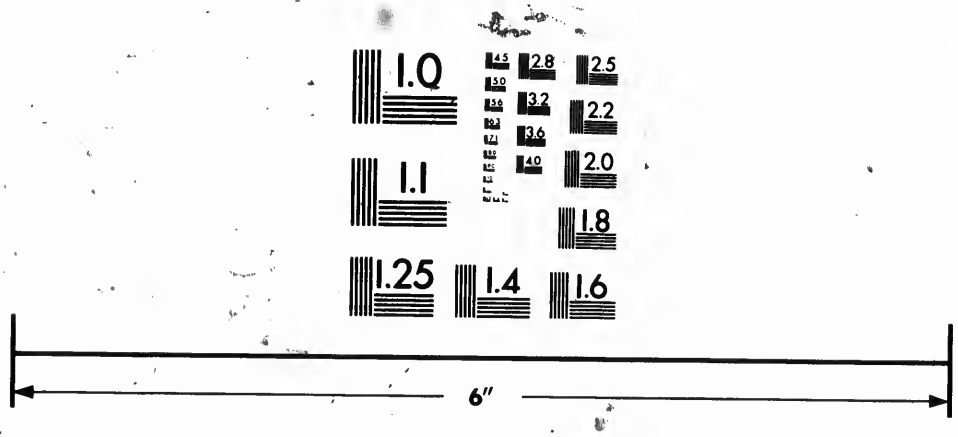

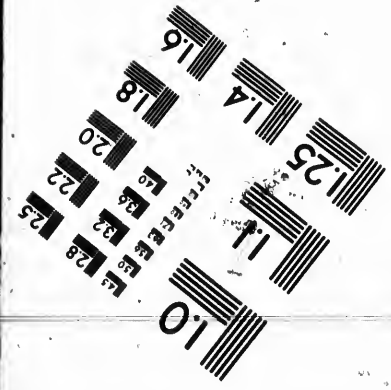

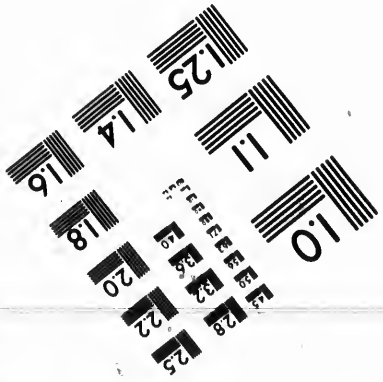

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well as loss of power in the posterior extremities, you will have well marked cerebral disturbance, and a comatose state, which, in a few hours, may give way to slight delirium, which, in some cases, lasts until death closes the scene. One symptom is paralysis of the muscles for swallowing. There can be no doubt that cattle and horses suffer from nervous diseases, and that without knowing how to account for it. It is more common in animals that are grazing in the bush, eating grass that may have become over-ripe, which acts first upon the digestive, and then upon the nervous system. The symptoms are dullness, produced in a short time; costive condition of the bowels; appetite gone; thirst intense. If you give him a pail of water, he will place his head in it, and you would think he was drinking rapidly, but you will find that nothing has been taken, for he is not able to swallow. These are prominent symptoms, he may get the water in his mouth, but cannot swallow it; but not from any soreness. The animal may show slight abdominal pain, and when he lies down he has no inclination to get up, but will lie stretched out; may move the legs. The pupil becomes dilated; the mucous membrane becomes impaired, although in the first stages they may have been infected; but after the convulsive paroxysms become more frequent, they become impaired. He may become perfectly stupid.

Causes.—Atmospheric influence, or it may occur in an epizootic form, from one cause operating on all at one time; water containing a great amount of organic matter; decomposition acting upon and affecting the nervous system. Some cases are caused by using water containing drainage from the stable. In some cases it affects the spine more than the brain, hence its name.

Treatment.—If there is a complete loss of power, of course it is hopeless; but if taken in the earlier stages, where it is confined to the spine, it may be treated. You must treat to relieve congestion, and try to prevent the spread of the disease. Use hyposulphite of soda, and change the food. Belladonna is highly recomended, one, two, or three drachms a day, and continue for some time, or its alkaloid, atropine; or give ergot of rye in two drachm doses; bromide of potassium in two or three drachm doses. Use judiciously a good stimulant—hyposulphite of soda may be tried. If there is loss of power, use slings, but not unless he can bear some of his weight upon the limbs. It is very difficult to treat a horse after he has laid for some time, as he will be covered with sores. You may give injections, to act upon the bowels, or use aloes, two to four drachms; but be careful if there is any irritation of the bowels. After some time, if there is still loss of power, use nux vomica. If he is improving some, say in four or five days, take him out and allow him to walk some; try the effect of tonics. Counter irritation to the lungs, stimulating liniments, hot and cold applications have been recommended, and may do good. Try hot and cold applications alternately. It may produce a good effect. If you think it does harm, try other treatment. This disease is sometimes called cerebro-spinal fever. There is a cause for every disease, but it

is sometimes very difficult to tell just what the cause is. Another high authority suggest the diffusible and more fixed stimulents, with carminitives and tonics—which are embraced in the following formula, to be given, mixed in a bottle of cold water, five times in the twenty-four hours: Powdered carbonate of ammonia, three drachms; powdered capsicum, two drachms; powdered pimenta berries, four drachms; tincture of nux vomica, twenty drops; mix. Drench the horse with cold water several times daily, adding sixty drops of commercial sulphuric acid to assist in sustaining the flagging powers of life. Oatmeal may also be given in the same way, and for a like purpose.

The prevention of this disease, like many others that affects domestic animals, is more easily accomplished than the cure. Use dry stables; also good feed, in which a drachm or two of the sulphate of iron, hould be mixed, and given once daily, when such diseases are in the vicinage, for eight or ten days at a time.

Ulcers.—It would be of little use to speak of internal ulcers, as of the brain, chest, or belly—they being beyond the skill of the most learned, much less the non-professional reader—but will confine these remarks to external ulcers, as of the skin and flesh.

HEALTHY ULCERS.—These are generally the result of an accident, or incision with a knife, or other instrument. Every sore which does not heal by what is called the first intention, but suppurates, is called a healthy ulcer.

Treatment.—Most healthy ulcers will heal of themselves; at most all that is required to be done, especially in warm weather, is to keep the granulations from growing too fast, and above the level of the skin; and for this purpose apply a solution of blue stone, or chloride of zinc as follows: Chloride of zinc, four grains; rain water, one ounce; mix. Or, powdered blue stone, two drachms; rain water, eight ounces; mix. One of these mixtures may be applied once a day, just sufficient to moisten the sore, and keep proud flesh down. The simple ointment of the drug stores is a good healing salve, and should always be in the house and at hand.

In neglected sores, and when proud flesh has grown up above the level of the skin of the healthy part, take a stick of caustic potassa, and hold one end with a piece of cloth, or stick one end in a goose-quill, and touch the sore with the other end of the caustic a few times, till the proud flesh turns black. Repeat at another time, if necessary. Keep the caustic in a tightly-corked bottle, or else it will be dissolved into fluid when next wanted.

INDOLENT ULCERS.—This variety of ulcer or sore usually attacks the skin of the legs and heels of horses, eating down into or below the surrounding surface. It is covered with a whitish-gray matter, and, in some few cases, small red spots are seen looking through the white covering. These are granulations, and are possibly unhealthy ones. (See Frost bites.)

Cause.—A bad habit of the body and blood; poor feeding, and debility.

Treatment.—Apply powdered bluestone to the ulcer, to eat off the unhealthy surface. Then apply a poultice for the night, made of any soft, moist material—say boiled turnips, carrots, or bran and flaxseed meal, made with a little warm water. The face of the poultice should be covered with powdered charcoal or brewer's yeast. Continue the treatment with an occasional poultice, and the solution of blue stone.

Feed the horse well, and give half-ounce doses of the sulphite of soda, once a day, to purify and enrich the blood.

Irritable Ulcer—Example: Sores on the pastern-joint irritated by the flies, heat and sweat of summer.

Symptoms —Cannot be touched without they bleed; angry looking, and very sore; highly inflamed, and extremely vascular.

Treatment.—Difficult to cure during warm weather, but easily healed in moderate weather, when there are few or no flies.

Dress the sore with oil of olives, one ounce; creosote, half an ounce; oil of turpentine, half an ounce; mix, and apply to the sore with a piece of soft cloth; once a day. Do not let any of the mixture run down on the hair, which will, if so treated, fall off.

Urine Bloody.—(See Hæmaturia.)

Varicose.—The enlarged vein on the [illegible]nt, caused by bog and blood spavin. (See Spavins and Tumors.)

Ventilation.—Few persons are aware of the vast importance of pure, fresh air, in the maintenance of health, and the prevention of disease, in both man and beast. However necessary pure air is in health, it is still more so to an animal when sick from fever and disease; and indeed there are diseases in which no treatment can or will be successful, no matter how skilfully directed, without pure, fresh air and cold water to drink. A badly ventilated stable or barn, will ensure in the spring of each year horses fevered and diseased. Coughs, colds, lung fever, influenza, grease, scratches, farcy and glanders, are the results of bad ventilation.

Who has not heard of the Black Hole at Calcutta, in which one hundred and forty-six men were confined for a few hours without ventilation, and only twenty-three survived the short confinement. Horses confined only for a few hours without ventilation, as was the case in two military expeditions sent out by England—one to Quiberon, and the other to Varna—in which the hatches of the ships were put down, and only for a short time, but sufficiently long enough to produce glanders in almost every horse. Hence, it will be perceived that, without good ventilation, a high standard of general health cannot be maintained very long.

Vives.—A term given to bastard, or an irregular variety of strangles. (See Strangles.)

Warts.—(See Tumors.)

Warbles.—(See Skin Diseases.)

Water Farcy.—(See Dropsy and Farcy.)

Weeping Eye.—As its name indicates, this is a flow of tears from the eye down the side of the face, instead of through their proper channel.

Cause.—Obstruction in the lacrymal sac, or nasal duct, from a disease called *fistula lacrymalis.*

Treatment.—This is the province of the surgeon and anatomist.

Wens.—The common name for external tumors.

Wheezing.—This is a sound given from a horse having enlarged glands, or thickening of the membrane of the wind-pipe, or the glands pressing upon the head decreasing its calibre. Whistling is caused by the same alteration of structure in the wind-pipe.

Whirl-Bone, a Sprain of the.—(See Sprains and Hock.)

Wind Galls.—Are soft but elastic swellings or enlargements. They are non-inflammatory in character, and are produced by the same cause, governed by the same laws, and present the same phenomena as bog, blood spavin, and other enlarged or distended bursa of joints, which are all produced by, and are evidences of hard work. No treatment of them will be satisfactory, as they will return again, even if they have been removed.

Wind-Sucking.—(See Crib-Biter.)

Worms.—The worms which inhabit the body of the horse are of many varieties. Some of them are harmless, while others interfere with his health. They are, 1st. The bot found inhabiting the stomach. 2d. The *Fundament* bot, found in the rectum, and often seen about the anus, and under the tail. 3d. The *strongylus and Filaria*, found in the aorta, and other blood vessels.

(1.) Stomach Bot.—These worms are the result of turning horses out to pasture in the summer months, and are produced from the eggs laid or glued to the fore legs of the horse, by the bot fly.

Symptoms.—An unthrifty coat, and loss of flesh after a run at grass, may be taken as an indication that bots are present within the stomach.

Treatment.—Improve the condition of the horse, so that the debilitating effects of the bots' presence may not interfere with the general health and condition of the horse; for it must be borne in mind that no medicine can, or will, dislodge or destroy these parasites short of killing the horse also.

Once the eggs are in the stomach, which seems to be the natural *nursery* both for their protection, and the propagation of their species, they cannot be removed by force. In one year from the time the eggs are taken into the stomach, will the bot be a perfect chrysalis, and will fall from the coats of the stomach, and be expelled with the excreta or dung. In a short time after, it will be provided with *wings*, and fly about, commencing the propagation of its species, which must pass through the same period of probation or incubation, as its progenitors. Give iron and gentian, in addition to good feeding, to prevent the bots from debilitating the animal too much. Take powdered sulphate of iron and gentian root, each three drachms; mix, and make one dose, to be repeated twice a week.

(2.) FUNDAMENT BOT.—Like that of the stomach, but also the result of a run to the grass. Instead of the eggs being deposited upon the legs, they are stuck to the muzzle or lips of the horse, and are the color of the skin, hence are not often seen.

Symptoms.—The following year, during the summer months, the *larva* of this species will be seen sticking about the anus, and under the tail, which in spirited horses proves a source of great uneasiness and irritation.

Treatment.—Injections of linseed oil, or tobacca smoke.

(3.) STRONGYLUS.—This variety, and a species of Filaria, are sometimes found in the blood vessels, and are similar in the effects produced in the horse, to those seen in sheep affected with rot.

Cause.—Feeding on wet and marshy land, and pasture having been flooded with water. Who has not heard of the effects produced from this cause, in animals grazed upon the course of the river Nile, in Egypt, after each inundation?

Treatment.—Support the strength by good, generous feeding, and give iron and gentian, each two to three drachms, once a day, removing the animal to high and dry pasture.

Wounds.—They are divided into simple, incised, contused, lacerated, punctured and poisoned. Wounds are more or less dangerous, when entering the chest and belly; as are also poisoned wounds, or those from the bite of a mad dog. Wounds followed by bleeding, will be found treated of under the article on Bleeding.

Contused, lacerated and punctured wounds are generally followed by suppuration, which should be encouraged by warm poultices applied to the parts, and should be kept freely open to allow the pus free escape. Wounds entering the belly or chest should be treated by placing a pad over the part to exclude the air, followed by the application used in simple wounds.

Keep down pain by giving twenty drops of the tincture of aconite root, three times a day, for two days only. Poisoned wounds will be found treated of under the article on Bite or Mad Dog.

Wourali.—A name given to a poison, which is prepared by the Macousi Indians, of South America, and used by them on the points of their arrows. The power of this poison is so great, that in four minutes after an ox, of one thousand pounds weight, was pierced in each thigh by an arrow poisoned with it, the poison took effect, and in a few minutes more his head and legs ceased to move. In twenty minutes from the time he was wounded, the ox was dead, having apparently died without pain.

Yellows.—Discoloration of parts of the skin from liver disease. (See Liver.)

Yellow Water.—(See Liver Diseases.)

Zoology.—That part of natural history which treats of the structure, habits, classification, and habitations of all animals, from man to the lowest of all the tribes.

INFLUENZA IN HORSES.

Owing to the prevalence of this disease amongst horses in Canada we make room for the following very able article written by one of the most skilful veterinary surgeons in the Dominion :—

Influenza, an Italian word, signifying influence, is a term that is usually applied to a disease of an epizootic character, to which the horse is particularly liable. As in the case of many other names for diseases, we fail to see its propriety, but our object in the present article will not be to discuss a reformation in the nomenclature of veterinary science, although that is much needed, but to consider the nature and treatment of the disease that is well known by this name, which occurs in different forms, and also presents many different characteristics. From time to time, even back to the most remote periods of antiquity of which we have any record, diseases of an epizootic character have appeared, both in the human race and also in the lower animals, with various degrees of intensity, often spreading devastion in their course. And there can be little doubt but that some of these outbreaks of disease were of the same nature as the disease called influenza, which we will now endeavor to describe. It is also known by other names, such as "distemper," "catarrhal fever," or "epizootic catarrh," or shortened to the vernacular "epizoo," as the outbreak of 1872-3, which was so universally disseminated over the United States and Canada, was denominated, and which will be well remembered by most of our readers.

The disease may rage over an extensive district, or even over a whole continent, or it may be confined to quite a circumscribed locality. The epizootic of 1872-3, broke out in a well cultivated and usually healthy country district, near Toronto, Canada, in the latter part of September, 1872. In a week or two it had spread east and west throughout Canada, and was prevalent over the greater part of the United States before the end of October. It was so universally disseminated over the greater part of the northern portion of this continent that few horses escaped the disease, and in the cities,

traffic was seriously interferred with, as during the time it lasted, horses and carriages could not be procured at any price.

The disease is singularly prevalent in some seasons, and although it exhibits some general characteristics in common, yet the epizootic of one year may very probably be marked by some particular symptom or symptoms, which do not appear in the next, and these variations in the symptoms and in the degrees of intensity of the disease, may also occur in different localities in the same season, or even in different individual cases. Horses in crowded cities and towns are more liable to the disease, and in them the type of disease is apt to be more severe. In the country districts, it is a more probable visitant of the stable, though horses out at pasture are occasionally attacked, and in the outbreak of 1872 very few, either in the stable or at pasture, escaped the disease. It appears at all seasons of the year, though more commonly in the fall, winter, and spring, than during the summer months, and no locality, soil, or geological or geographical formation of the country seems to be exempt from its visitations. At times it appears to be enzootic, pervading one town, or is confined to quite circumscribed localities. The probabilities of the disease seem to be increased in proportion to the number of horses kept in the same stable, as animals crowded together, especially if in damp or ill-ventilated stables, are much more liable to it, and are apt to suffer from it in its more severe forms. Young horses are said to be more predisposed to it than older ones, but no age, sex, or condition, is exempt from its attacks. Neither will one attack exempt the animal from the disease at any succeeding outbreak of it. By almost universal consent, this malady has been, in veterinary literature, denominated Influenza, and the common use of the term, and the frequent mild types of the disease are apt to deceive the ignorant, and to lull many persons into a false security as to the not uncommon severity and danger which may accompany it. In most cases there are certain general uniform symptoms, but outbreaks, and, indeed, individual cases, occur where the most essential difference in the symptoms and the dangers to be apprehended prevail. And to this may, in a great measure, be attributed the very different ideas with which it is regarded by the public at large.

The disease is certainly to be attributed to atmospheric influences. It must be produced by some morbid matter or "virus," that mingles with, and contaminates the air. But the precise nature of this morbid matter, or "virus," its origin and mode of production, science is as yet unable to discover. Many different theories as to its exact nature have been advanced, but the best and most recent authorities coincide in the opinion that it is some morbid matter or principle floating in the air that has the power of reproducing itself, either in the atmosphere or in the bodies of the affected animals. Prof. Williams, after reviewing different opinions, says:

"May we then conclude that animal malaria, or those eminations which

arise from many animals congregated together, from excretions and decomposing animal matter, give rise to sporadic or enzootic instances of the disease, and that this influence, owing to some undetermined condition of the atmosphere, may so extend as to embrace the horses of a town or country, or a continent, and thus become epizootic or panzootic?"

This appears to be a reasonable view, but as we are unable to demonstrate to a certainty the original cause of the "virus," it appears to be impossible to guard against its effects; though, no doubt, as before mentioned, animals crowded together in ill-ventilated or damp stables, are more predisposed to the disease.

The symptoms vary considerably, according as any particular organ of the body may be more especially affected. The air passages of the head are almost invariably affected, and in severe types of the disease, it is often difficult to point to any part of the system that is not involved. A prominent symptom is often the early and excessive weakness, amounting in some cases almost to paralysis; failure of the appetite, quickened and weakened pulse, scanty discharge of excrement, high-colored urine, and the animal temperature very much increased. We have seen many outbreaks in which a temperature of 106 degrees Fahr. was not uncommon, though this is, we are aware, a higher temperature than is usually announced by the best authorities. The eyes are more or less sunk in the orbits, with the upper eyelid drooping, the conjunction of a yellowish red color, and all the visible mucous membranes of a yellowish cast, an evidence of the absorption of bile. In most cases there will be cough and sore throat, and in some the disease will extend into the chest, causing bronchitis or pneumonia of a low asthenic character. In some cases, abdominal pains may accompany the disease, showing that the mucous membrane of the digestive organs is also involved. The usual colicky symptoms will then be noticed, also the frequent passing of small quantities of fæces, generally hardened and thickly coated with mucous. The disordered state of the liver, as evinced by the yellow appearances of the membranes before mentioned, also occasionally by fæces of a dirty clay color, and irregularity of the bowels, sometimes torpid, and at other times relaxed, is to be attributed to the bile not being freely discharged from the bile ducts into the intestines; it therefore accumulates in the liver, and is absorbed into the general circulation. As the animal progresses towards recovery, dropsical swellings of the legs, chest, and abdomen, often appear, or rheumatic complications may occur, in which the joints or tendons may be implicated. The dropsical swellings are simply the result of the weakened state of the system, and will rapidly disappear as the animal regains in strength. The rheumatic swellings may be known by their being hot, painful, and hard to the touch, and may cause severe lameness; they also sometimes remain for quite a length of time after the animal has in other respects recovered its health.

Influenza is a blood disease that *must run its definite course;* therefore,

medicines or drugs, given with a view of cutting short or "curing" the disease, can not but be detrimental. The object must be to endeavor to keep up the strength of the animal and allay the distressing symptoms, if possible, so as to assist nature in her efforts in eliminating the effects of the "virus" from the system. Bleeding, or purging, or anything of a weakening nature, must, on no account, be attempted. Good nursing and attention to proper hygienic conditions are imperative. The animal should be placed in a comfortable box stall, well bedded down, and well ventilated; the body clothed, and the legs bandaged; injections of warm water should be given to assist in moving the bowels should they be costive. The food should be offered frequently, and in small quantities, and should consist of bran mashes or boiled grain, or a few roots. Inhalations of the steam from a hot bran mash, or from warm water, are sometimes very beneficial in relieving the cough and assisting the nasal discharges; but they must on no account be too hot, or too closely confined to the head. The practice of forcing the poor animal to inhale the poisonous fumes from burning sulphur or burnt leather, or other abominations, can not be too strongly deprecated. The throat may be rubbed daily with a liniment composed of equal parts of spirits of turpentine, liquor ammonia, and linseed oil. Plenty of cold water should be frequently offered, in which a few drachms of the nitrate of potass may be mingled, about three or four daily, and; should the weakness be excessive, there are few better stimulants for cases of this nature than about one ounce of spirits of nitrous ether, two or three times a day, in a little cold water as a drench; but great care is necessary in drenching, and much harm is often done by forcibly administering drenches when the poor animal is, from the soreness of his throat, much opposed to swallowing, as portions may be poured down on to the lungs. A drachm of the chlorate of potass may be given two or three times a day in the food. If there be no appetite, milk may take the place of water to drink, or oatmeal gruel may be stirred into the water offered. The appetite may be coaxed by frequent changes, etc.; but it is far better not to forcibly pour down gruels, beer, or anything as a food, in spite of the poor animal's often determined resistance. It must be remembered that it is not the quantity of food that is forced into an unwilling stomach that is beneficial to the poor animal, but the amount that is properly assimilated, anything over that amount being absolutely injurious. The digestive organs participate with the rest of the system, and are not capable of performing their functions as usual; hence the cause of the loss of appetite. Should the lungs appear to be affected, many practitioners advise mustard blisters to the sides as a counter irritant, but there is abundant room for doubt whether the irritation produced thereby will not more than counterbalance their beneficial effects. Derangements of the liver are to be combatted by keeping the bowels as regular as possible by laxative and easily digested food and injections. A little linseed oil may in some cases of this nature be absolutely necessary, but lax-

ative medicine had better be avoided if possible. Colicky pains also sometimes occur, which had better be relieved by hot fomentations, or an ammoniacal liniment well rubbed into the abdomen, and injections. Light anti-spasmodics, as half an ounce to an ounce each of laudanum and nitrous ether, in a little water, may also occasionally be necessary. Any acidity of the stomach, which would be manifested by grinding the teeth, licking the walls, etc., may be removed by giving a few drachms of the bicarbonate of soda, two or three times a day, in the food or water.

The "heroic" treatment for this disease, that which in the early days of veterinary science was adopted almost universally for all maladies of the lower animals, was, no doubt, in a great measure the cause of the severity of the outbreaks of this disease, in the past, that we read of, although it is possible that the type of disease may have been, in some cases, severe. At the present time, and under a better understood mode of treatment, influenza is usually, by no means, of a fatal character.

It should be clearly understood that the disease is the result of a "virus," or blood poison, which requires a certain time to expend itself and be eliminated from the system. Good nursing and care are of the most paramount importance, and too much "drugging" is to be especially avoided.

Some writers have divided influenza into three forms, according to the parts implicated—the catarrho-rheumatic, the gastric or bilious rheumatic, and the gastro-erysipelatous form. In this last, by Prof. Williams denominated "epizootic cellulitis," the cellular or connective tissue is especially envolved; the weakness is not so marked a symptom, and the pulse will be harder and fuller; there will be swellings of the eyelids; dullness, pain, and swellings in the legs, particularly about the joints; the digestive organs are usually deranged, the fæces hard, dry, and covered with mucous; there is also often a hard cough. The recoveries from this form are usually much more rapid than from the preceding forms, the weakness not being so great; though not unusually in this form of the disease, from its tendency to increase the coagulable properties of the blood, blood clots may be formed, which, plugging important blood vessels, fatal results may ensue, even some time after apparent recovery. In consequence of this tendency, the treatment of this form must be somewhat different. Medicines that increase the fluidity of the blood are requisite. In the early stages a mild aloëtic laxative may be administered—about four drachms of Barbadoes aloes and one drachm of ginger. This should be followed by three or four drachms of nitrate of potass in the water, and the food should consist mainly of bran mashes. The chlorate of potass in this form of the disease had better be avoided, as it is considered to increase the coagulability of the blood, whereas the nitrate will lessen that tendency and increase its fluidity. The carbonate of ammonia as a stimulant, if stimulants are required, also is considered to increase the fluidity of the blood, and may be given in two or three drachm doses, in a

little water, two or three times a day, and the quantity of nitrate of potass may be increased to two or three ounces a day, in the water.

In addition to the foregoing forms of influenza, a disease of an epizootic character frequently appears in the horse, which especially attacks the serous membranes and substance of the lungs. It has been claimed that influenza, properly speaking, is confined to the mucous membranes; but our object, as before mentioned, is not to discuss the propriety or impropriety of the term, but to describe some of the principal varieties of epizootic diseases to which the horse is particularly liable, whether that term can be properly applied to them or not, and a form attacking the serous covering of the lungs, and also their substance, is exceedingly common. This has been called "epizootic pleuro-pneumonia of the horse," but it is an essentially different disease from the well known "epizootic pleuro-pneumonia" of the ox tribe, although the same structures are affected in both. It consists in a low kind of fever, accompanied by an inflammation of the lungs or their serous coverings, or often of both. It is more common in the spring months, and horses at this season losing their heavy winter coats are certainly more liable to feel the effects of the sudden changes of temperature that then occur, although it undoubtedly often appears as an epizootic. The earliest symptoms to be noticed are, the animal will be off its feed, and dull; perspiration easily induced; also easily fatigued; cough may or may not exist from the first; the pulse will be found much quickened, and the animal temperature heightened; the visible mucous membranes will be deepened in hue, and the abdomen "tucked up." After a day or two, the usual marked symptoms of pleurisy may be shown. The animal does not lie down; the elbows are turned out; if caused to move, he emits a sort of a groan; respiration is quickened; the ribs are fixed, and the abdominal muscles, are called into play to assist in the act of respiration, causing the marked line along the flank and border of the false ribs, that is so characteristic of pleurisy. The pericardium, the sac enclosing the heart, is also very apt to be involved in this form of the disease. This may be known by an irregularity of the pulse, and often a peculiar indistinctness in its tone. All these symptoms are much aggravated, and the dangers to be apprehended much increased, should the animal be driven or worked after the first symptoms of the disease have been manifested.

In the treatment of this disease, complete rest from the first is of primary importance, and pure air is equally necessary. The body should be clothed, and the legs hand-rubbed and bandaged. In short, much the same general line of treatment should be adopted as advised for the catarrhal or broncho-catarrhal forms. The strength must be husbanded as much as possible, and endeavors made to keep the different excretory organs in a natural state, as before described, "drugging" or depletory measures of any kind being especially avoided. Nitrate of potass may be given, dissolved in

the drinking water, to the extent of one to two ounces a day, and blankets saturated with warm water, wrung out, and laid over the sides, and covered up with dry ones, which may be repeated again and again, care being taken that the animal does not get chilled during the act of changing them, or after their application has been discontinued, we have found especially beneficial in relieving and soothing the poor animal when the difficult breathing, pain, and distress have been manifested. We believe this mode of treatment is far better and more soothing to the horse than the extensive blistering or applications of mustard to the sides, that have at times been so urgently advocated.

The principal dangers to be apprehended are death from "hydro-thorax" (dropsy of the chest). This used to be a very common sequel to this last form of the disease when the old depletive or "heroic" treatment was adopted. "Thick wind" is also not an uncommon sequel from disorganization, consolidation, or adhesions of the lungs or their pleural coverings. "Roaring" is not an unfrequent result of the catarrhal form from ulceration of the larynx or other disorganization of that organ, or thickening of its lining membrane. Rheumatism, in its various forms, is also not an uncommon sequel to influenza. In all types of the disease, as the animal progresses towards recovery, convalescence may be hastened by the administration of, at first, vegetable, and afterwards mineral tonics.

EXERCISE

ITS INFLUENCE ON THE HEALTH AND PHYSICAL DEVELOPMENT OF ANIMALS.

The same distinguished Canadian veterinarian, whose views in the preceding chapter on "Influenza in Horses," have been so ably expressed, has in the following article on "Exercise," given additional evidence of his thorough knowledge of the horse; and we believe we are within the mark when we add that one half of the heavy draft stallions that die suddenly in Canada, are the victims of over-feeding and want of exercise:—

The physiological study of the animals around us demonstrates that they are especially designed for locomotion. The infant animal of a day old, once launched into existence, exercises itself more from day to day, in proportion as its strength increases. Instinct urges it to seek its mother's teat, where it finds food already prepared, lasting until such time as it is able to seek nutriment elsewhere. It braces up its limbs, it walks, speedily becomes more fearless, and soon, trusting itself to run, feeling more and more at liberty, power and courage grow up in it, and finally it quits its mother. In one respect, it feels itself in the enjoyment of independence; in the other, it feels it is under the same law of nature as all other creatures—a law which insitnctively urges it to provide for its own wants, and thus watches over its preservation, and, by the act of reproduction, over the preservation of its whole species. Again, in searching for food, the animal is compelled to move about; its limbs grow strong from exercise, and its body becomes developed in the same proportion, until it reaches mature growth. The impulsion the body receives to put it into action is derived from the fleshy, fibrous, elastic substance called *muscle*, which clothes the osseous framework. Muscles constitute the organs, or instruments of motion. Although, however, in themselves the seat of action, they evince no movement but through the influence of the brain, the source whence is derived the activity of all the senses. Next

in importance to the brain, the noblest part of animal organism, one which human penetration has hitherto failed to unveil the mystery of, and probably for ever will, and which is most wonderful, are the muscles, the veritable actors in motion, in exercise, in work. Their attachment to the bones, their structure, their number and their insertion, their uses or properties, and, lastly, the admirable accordance with which their functions are conducted, are a most interesting study.

Myology opens a vast field for meditation, both for the researcher in anatomy and to the philosopher. Here it is in an especial manner that the thinker admires the work of the Creator; here it is that he is struck with astonishment. Works so perfect as those he meets with in the animal economy surpass the powers of his imagination. Research carries him to a certain point, at which science halts, unable to proceed further, and he is forced to confess his inferiority. Science is compelled to acknowledge a power over her which, ever active, and never in need of repose, sets an example of activity. It is the veritable *perpetuum mobile*, which gives life to the entire creation, and at which man must for ever marvel without being able to discover the key of action.

In regard to man, muscular action may be said to extend its influence beyond his mere physiological position. It affects even his social relation. Among the ancients, legislators and governors were seen regulating the exercises they would have the people practice. They judged that activity, exercise of body, was the best means that could be taken to have well-constituted and useful members of society. The Olympic Games were set up with the view of keeping in practice a people by nature warriors. With the Greeks and Romans, the first quality a man could possess was strength and vigor. The principle of the ancients was, that an energetic, great, and courageous soul could inhabit none but a well-constituted, strong, and powerful body. In such an one they beheld expression of mind urging him into action. The vigor of their law in this particular smacked even of cruelty. They ordered that mothers bringing forth malformed progeny, or as such as bore any unequivocal sign of physical imperfection, rendering them unfit for the usual exercises, should put them to death at birth. And so long as the people obeyed these too-vigorous laws, and led a life of activity, laboring with persevering energy towards their development, physical as well as moral, we find them sober, robust, and great. Do we of the present day not look with astonishment at the traces of courage and devotion of the people of antiquity? History informs us that their energy and bravery have even gone contrariwise to opulence and vice, luxury and inaction, by which they have been led on to destruction. The general movement, the activity, and industry which have given birth to the arts and sciences, constitute the veritable base of the social order and prosperity of nations. The more man exercises his faculties, physical as well as moral, the more his well-being prospers, while the more

he abandons himself to inactivity, the more he hastens his destruction. That exercise is as requisite for the production of a good and substantial breed of horses as it is for a superior race of men, no one will deny. Without labor, and that somewhat forced, too, as well for breeding mares as for stallions, we can never expect to bring breeding to its highest perfection.

It is a common practice all over the country to reserve stallions almost exclusively for breeding purposes. The only exercise they are compelled to take is when they are moved from one station to another, a distance which rarely exceeds ten or twelve miles. This sometimes occurs not oftener than once in two weeks. How much better it would be, both for the sire and his progeny, if he were made to work for his living. The state of comparative inactivity in which this class of horses are kept is a frequent cause of sterility. Too much in action extinguishes the generative power, and incapacitates him as a foal getter. This, however, is the work of domestication—man directs the intercourse of the sexes. The horse no longer breeds but at his command. Since, then, man has made himself absolute master over horses, it is his duty to find means to make amends for the privilege he has deprived them of, and this compensation will be found in work. It is well-regulated exercise alone that guarantees in the domesticated animal a long and useful life. Want of exercise and too long standing in the stable vitiates the blood, and causes the muscles to lose their elasticity and energy. The horse in health, using his strength daily in the open air, and thus exhausting his powers, breathes with expanded lungs. Every muscle, every fibre of his body is on the stretch, ever ready for renewed efforts, so that it is not the muscles only that become augmented by a well-regulated exercise, but the organs of respiration are also benefited by it. The lung of the working horse presents a healthy aspect. It is voluminous, and plays its part with freedom; while, on the other hand, in the case of the stallion where too much indulgence has been bestowed, and too little activity required, we find a lung shrunk and doughy, and without energy. When we deprive the growing colt of exercise, we stifle the most promising qualities, and he, having them undeveloped in himself, in his turn, robs all his posterity of them. Thus it is that we often see, step by step, the deterioration of such excellent stock, the original of which exists no longer but in our recollection. Nevertheless, we should not breed from mares of dilapidated constitutions, worn out by over work. Nothing is better for mares kept for breeding than moderate and regular work. The intelligent farmer may, in this way, breed from mares up to twenty years old. Not only can the mare do work during the period of gestation, but does so both to her own and her offspring's welfare, and the success of the breeder will be the greater as he proportions the feed of the mare to her work. This, well ordered, it is, that constitutes the whole mystery of breeding the domestic horse. Our aim is to develop the utmost strength and celerity of which a horse is capable; and it is by well regulated exercise and

proper feeding that these two qualities are successfully developed. Exercise produces suppleness in a horse, and strength and endurance under the severest trials and most laborious work. Nothing is so contrary to the horse's nature, destined, as he is, for exertion, as lengthened and continued repose. With a view of setting forth the indispensable necessity of exercise for horses, it will be as well, perhaps, to enumerate the injurious effects resulting from want of exercise :

First. Prolonged repose in the stable favors in the animal the plastic process. His fibres become distended, the cellular tissues surcharged with fat, insomuch that the whole body becomes weak in proportion as it grows bulky, and in a short time becomes a spongy mass, lacking altogether energy and vigor. In such a condition the horse becomes a burden to himself and comparatively useless to his owner.

Second. The muscular system grows weak, not only in proportion to the relaxation of its fibre and to the softening of the whole body, but, in addition, as the surcharge of useless fat, incommodes in particular the extensor muscles in their movements, which succumb under the weight of fat, and thus it is that horses over fed and under worked become short steppers, foundered, etc.

Third. The over-fat horse not only becomes soon fatigued, but in traveling wears his legs out faster, and, above all, does mischief to his feet. Having an enormous weight to carry, the hoof spreads and undergoes various deformities, more or less remarkable according to its nature, such deformities being always slow, frequently difficult of removal, and such as keep the horse for a greater or less time out of work.

Fourth. For want of exercise the wind grows short, accumulation of fat in the cavity of the chest being opposed to a free expansion of the lungs. This likewise detracts from the speed of the horse, and his power of enduring fatigue.

Fifth. Constant ease impedes the freedom of respiration, and tends to the formation within the body of carbon, and this accumulation, favored by a tardy respiration, becomes the occasion of a renewed deposit of fat ; and since, at the same time, the blood becomes thick, it is considered as the source of many maladies in animals in general.

Sixth. Inaction weakens the digestive organs. Horses that have too little exercise are more subject than others to colic and indigestion.

Seventh. The general circulation of liquids penetrating the tissues, becoming more tardy, the consequence is, a disproportion between venous and arterial blood. The more sluggish respiration grows, the less arterial blood is made ; and while the blood engorges the veins, it becomes surcharged with carbon, as is evinced by its deeper hue. Again, a slackened circulation becomes the occasion of œdematous swellings in the limbs, windgalls, etc., and these are observed to disappear in the ratio in which exercise is enforced.

Eighth. Inaction augments the sensibility of the skin, it becomes relaxed, and the animal, in consequence, is rendered more susceptible of external influences.

Ninth. Long sojourn in the stable notably affects the vision.

Tenth. The horse whose exercise is neglected, grows indocile, and especially so if he be young. Through idleness he contracts all manner of bad habits in the stable, such as rubbing, cribbing, kicking, etc. Some of these habits disappear under suitable and sufficient exercise. This determines the strength of the muscles, the assimilation and absorption of the juices. It has a tendency to enlarge the cavity of the chest, by rendering respiration more easy of performance, and it checks excess of fat by favoring transpiration, making good the saying of the groom, that "Exercise is as good as a dose of physic." In a word, exercise and labor constitute the best preparation for fecundity, at the same time that it ensures health and longevity.

Notwithstanding that exercise exerts great and wholesome influence on the horse, such advantage cannot be ensured but under such conditions as the following:

1st. Provided that the exercise be judiciously apportioned to the strength of the animal.

2d. Provided the exercise be of a kind suitable to his nature.

3rd. Provided that every requisite attention be paid to him after exercise.

That which is especially hurtful is the *excess*, whether it be of food or of work. It is the effect of over-fatigue that it is our business now to enquire into. Every over worked animal wears out the faster. Frequently a single act of brutal or inhuman treatment is sufficient to ruin a good horse for ever, especially one of ardent temperament. Violent exercise, urging the animal beyond his powers of endurance, tends—

1st. To over exert the muscular power, and that directly influencing the organic life, causes quicker expenditure of the vital energy.

2d. To abate to too great a degree the plastic power. Muscular strength may be lowered to that degree, that repose even and improved feeding become insufficient to recover it, whence results exhaustion of the entire organism.

3d. To diminish the suppleness and pliancy of the locomotive levers. In proportion as the muscles become stiff, from over exertion, the sinews grow relaxed, and the joints in the end anchylosed. The synovia, so necessary to preserve their flexibility, becomes diminished and dried up. A certain interarticular crepitation is heard, indicative of such dryness. The step of such animals is infirm, and they are often found stumbling. Abnormities of every kind, in quick succession, appear exteriorly, in the form of wind-galls, curbs, exostoses, spavins, etc.

4th. To augment the number of inspirations by hurrying the natural

breathing. The inspirations, which in a state of repose in a horse in health are from 10 to 12 per minute, become increased to 20 or 30, and during exertion even to the maximum of acceleration, as far as 130 per minute. The pulmonary tissue, from unnatural dilatation, becomes over stretched and bursts. Rents in its texture follow, and the air escapes into the parenchymatous substance and thence underneath the pleura. To this may be chiefly attributed the cause of pulmonary emphysema—causing broken wind (heaves), rendering the subject thus injured comparatively useless for work.

5th. At the same time it augments the pulsation, raising it from 38 or 40 to 70 or 80, and possibly as high as 140 per minute. From that time the heart takes on gradually proportionate dilatation, while the lungs and great blood-vessels suffer from too sudden affluxes of blood, which in consequence is thrown back upon the brain, occasioning congestion. Depots of blood become established, the decomposition of which hastens the death of the animal, of which we have examples frequently in the death of valuable race-horses; the state of sur-excitation to which they are pushed by the striving drivers, elated at the idea of winning, having given rise to rupture of one of the principal blood-vessels, and the poor animal dies from apoplexy—the victim of over-excitement. In regard to the pernicious effects of excessive labor, we may observe what does the mischief in particular is extreme speed, especially when the subject is over burdened. This is the reason why street-car horses wear out so much quicker than those used for teaming purposes, though the latter work would seem the more exhausting. For a like reason we see race-horses and livery stock lasting less time than such as are worked more hours but at a diminished pace. Agricultural horses that work from sunrise to sunset last twice or thrice as long, because, though the burden they bear may be a heavy one they are not rushed at it, but on the contrary are allowed very much to make their own gait.

In observing the influence of exercise on horses, we find that all muscular action tends to produce efforts whose united powers constitute what in one word may be denominated *strength*. It is not at all times that the efforts of the same horse are equivalent in force; his power will be commensurate, first, with the weight he has to carry; secondly, with the speed he has to travel; thirdly, with the duration of the pace; fourthly, with his breed; fifthly, with the season and state of the weather and the condition of the ground over which he travels.

IMPORTANCE OF VENTILATING STABLES, IN VIEW OF PREVENTING DISEASE OF THE LUNGS.

It was the intention of the Creator that all animals, so long as they were permitted to exercise their natural instincts, and thus comply with the requirements of physiology—the science of life—should enjoy health and long life. Hence a great amount of disease and death results from the evil of domestication.

One of the conditions which physiology imposes, in order that a horse shall enjoy health, is, that the atmosphere, at all times, and under all circumstances, shall be uncontaminated, so that the blood shall be decarbonized and purified of the defiling elements acquired in the course of circulation.

Let the reader understand that the lungs are something like a sponge, elastic, composed of a myriad of cells. In the former, however, these cells have a vast internal surface, communicating with each other up to their common origin, the bronchial tubes and windpipe. On their internal surface we find a delicate yet highly important membrane permeable to atmosphere. In extent, it is supposed to occupy a square surface equal to that of the external body. If pure—zephyr-like—it fans into healthful blaze the flame of life, upheaving from the living Vesuvius arid lava, in the form of carbonic acid gas, almost as destructive to animal life as that issuing from its great prototype proves to vegetation.

The stable atmosphere being pure, and the lungs in working order, the blood is well arterialized, capable of supplying the waste of the animal machine and renovating its tissues. On the other hand, should the atmosphere be impure, it fails to vitalize the blood. The latter is unfit for the purpose of nutrition, and may be considered a non-supporter of vitality. Hence the need of pure air, the breath of life.

But are horses always furnished with pure air? Let the owners of unventilated, crowded, filthy, down-cellar and low-roofed stables answer. Let those who have stables in the region of swamp, sewer, and stagnant pools of water answer. In such locations disease and death run riot, and the noble

compauion of man, instead of being within the ramparts of the science of life, is on the margin of death's domain. He may exist for several days without food and water, yet the consequent result is nothing when compared to that occasioned by breathing an atmosphere highly charged wiih emanations arising from his own body excrements and decomposing bedding.

A horse is said to consume in the lungs, in the coarse of twenty-four hours, ninety-seven onnces of carbon, furnished by venous blood. In order to perform this feat he requires 190 cubic feet of oxygen. Now, suppose there are ten horses occupying the stable. They require, in the same time, 1,900 cubic feet of oxygen, and consume 970 ounces of carbon. They are supposed, also, to give out from the lungs a volume of carbonic acid gas equal to that of the oxygen inspired; and supposing the atmosphere to be saturated with only five per centum of the former, it is a non-supporter of life. Hence, a horse shut up in an unventilated stable must, sooner or later, become the subject of disease. The evil may be postponed, but the day of reckoning is sure and certain.

Diseases, such as horse-ail, influenza, catarrh, strangles, and glanders, often originate and prevail to an alarming extent in the unventilated stable and pest spot; while in other locations, favorable to the free and full play of vital operations, the favored ones seem to enjoy a remarkable immunity from the prevailing disease, or epizootic.

Stablemen and husbandmen are often led to remark, that when they keep but few animals, disease and death, except in cases of accident or old age, are quite rare, but so soon as they crowded the same, sickness and death were the consequences. In view of supporting this theory, we may be permitted to remark that ship and jail fevers may be manufactured *ad libitum*, at any time when a large number of persons are congregated together in a given space, no provision having been made for the admission of pure air. The unfortunate prisoners in the Black Hole of Calcutta are an example, and the mortality occurring on board our immigrant ships furnishes another illustration.

A number of horses were once shipped from England to Spain, and on the passage, a violent gale arising, it became necessary to batten down the hatchway. The consequence was that most of them ultimately died of either glanders or farcy. We contend, therefore, that the active or morbid germ of disease enters the living citadel through the pulmonary tisssue in an insidious manner, and, therefore, much oftener than the generality of men would be likely to realize. Therefore, it is a matter of vital importance that attention be paid to the ventilation of our stables. If proper sanitary regulations were established, and fully carried out in all stables, glanders and other infectious diseases would be exceedingly rare.. They are so among horses free from the control of man, whose stalls are broad as from ocean to ocean

their height ranging from earth to regions above, the space pervaded by a pure atmosphere concocted by the Great Chemist, pure as the pearly drops and refreshing as the morning zephyr. In such locations death has no terrors nor disease any victims.

BRIEF EXPOSITION OF THE FUNCTION OF THE LUNGS.

The principal function of the lungs is to arterialize or decarbonize the blood; that is, purify it. This arterialization of the blood, which goes the rounds of the circulation, is more essential to life than either food or water; for men and animals can exist for several days, perhaps for two weeks, without food, yet the same can not live over a few seconds unless supplied with a sufficiency of atmospheric air. Hence, in the popular sense, pure air is the "breath of life."

The functional acts of respiration are necessarily divided into two parts; and in cattle the number of respirations are about twelve per minute, varying, however, according to the temperament of the animal, and the condition he may be in at the time of making the observation; while in horses the respirations are more frequent, varying in health, and when at rest, from fourteen to twenty-five; yet, under excitement and disease, they sometimes number over one hundred.

When an animal is located in a pure atmosphere, and the lungs are in good working condition, all the impurities contained in venous blood are brought into the presence of oxygen through the lining membrane of the air-cells, and thus a change in the color and character of the blood is immediately effected, In the first place, the venous blood, as it appeared before having been submitted to the action of the atmosphere, was of a dark purple color. By union with the oxygen of the atmosphere, it has changed its color to one of scarlet. Next, the union of oxygen with the carbon of the blood liberates carbonic acid gas and vapor. The blood is now fit for circulation and for the renovation of the tissues. It appears, therefore, that as carbon exists in the venous blood, the lungs must be the pulmonary furnaces. The air-cells are flues or safety-valves, the membrane of the cells being permeable to oxygen, yet suffer not the blood to escape. Pulmonary combustion, therefore, bears some analogy to the combustion of carbon or charcoal in a stove; for, in that case, the oxygen causes the generation or evolution of carbonic acid gas.

THE EFFECTS OF VARIOUS KINDS OF FOOD.

It is customary, in some stables, to feed horses, nearly all the year round with what is known as "cut feed," which is composed of cut hay, meal, shorts, salt and considerable water; the whole is mixed together and served out, sometimes without regard to quantity. This kind of food might, and sometimes does, agree with horses, but it is not right to feed them, year after year, on the same, for the reason just set forth. Another reason for objecting to this food is, that, in the stables alluded to, we hear of a great many cases of tympanitis and flatulent cholic (diseases somewhat identical), arising, no doubt, from the presence of so large a quantity of water as some persons are in the habit of using. It saturates the food, and retards digestion. Not only this, but when dry food, highly charged with water, enters the stomach, the temperature of the latter causes the food to swell—increase in bulk—and distends that organ, and also favors fermentation instead of digestion; hence arises flatulency. We do not, however, mean to contend that such food is at all times the direct cause of indigestion, cholic, etc., because many stablers are ready to testify that they have fed the same for many years without any apparent inconvenience to their horses; but we contend that it acts indirectly in the manner alluded to; and, although some horses may "get used to it," and others, having wonderful digestive organs, assimilate it, yet the day of reckoning may not be far off. We contend that water taken with food always retards digestion. The proper solvents of the food are the gastric fluids, and the horse has abundant facilities for supplying the requisite quantity. An ordinary horse is said to secrete, while feeding, fluid, of salivial and gastric characters, at the rate of one gallon per hour—enough, we should judge, to saturate a common meal; therefore, the water is not needed. We urge no objection against the more rational custom of merely sprinkling the food with salted water, in view of absorbing dust, which often abounds in inferior hay, but do seriously object to the practice of using a large quantity of cold water in the preparation of food for horses.

From experiments made by scientific men, it has been ascertained that parsnips, carrots, turnips and cabbage, which contain from 80 to 90 per cent. of water, require over twice as much time to digest as when the food is free from water. Cabbage, for example, requires twenty hours, and broiled beef steak only eight, to digest.

Turn a cow into a luxuriant pasture of grass or clover, and, after partaking of one or the other, she is liable to become "blown" or "hoven"—

tympanitic; the abdomen becomes enormously distended with gas (either carbonic acid gas, or sulphureted hydrogen), and, unless the same be condensed or evacuated, rupture and death are sure to follow. This imperfect digestion and consequent generation of gas is due to the presence of vegetable fluids found in green fodder. Therefore, animals having weak digestive organs, predisposed to flatulency, should have the privilege of watering their own food with salivial fluid. The best diet for such an animal would be "dry feed," composed of ground oats, cracked corn, "fine feed," and a small quantity of sweet hay. On the other hand, a constipated state of the bowels always indicates coarse food; and in this view the English use chopped straw and coarse bran, with decided advantage. Animals should never be watered immediately before nor after meals, after the lapse of an hour from feeding time is the best.

THE QUANTITY OF FOOD REQUIRED BY A HORSE.

The adult horse does not require so much of the flesh-making principle as the young and growing animal, but he seems to require a greater variety. The adult merely requires enough to replace the waste—the wear and tear of his system. If he obtains more than this, the surplus is either excreted from the body, or else stored up within the same in the form of fat; and everybody knows that a fat horse or fat man are not best adapted for a race nor hard labor, but of all others (except those in a state of debility), they are most subject to acute disease. With the young and growing animal the case is different. Here we require bone, muscle and nerve. Oats, corn and pollard furnish the same. The colt obtains from its mother's milk all the elements of its own organization in a concentrated form—all that seems necessary for developing bodily proportions and hereditary traits; therefore, when weaned, the colt must be furnished with the same equivalents in the form of fodder; ground oats, wheat bran, and meal furnish the same. It is the young and growing animal that requires our greatest attention. If our readers desire to raise colts that shall remunerate them for the trouble and expense incurred, they must feed the same, during their minority, with a liberal hand. Any neglect at this period can never be made up in after life. The subject will always remain lank and lean—living monuments of their master's folly or ignorance, as the case may be. In addition to the food required for the colt's growth, we must also furnish enough to supply the waste incurred by expenditure of muscular power. We all know that the young are very active and playful. Every muscular movement involves an expenditure of vital force, and thus exhausts the system; therefore, in view of developing their full proportions, and promoting the integrity of the living mechanism, they must have nutritious food, and plenty of it. They are not, however, to have a large quantity at a time, but little and often. Their stomach is small, not larger than that of a man's. Should it be over-distended with innutritious food, the organs of respiration and circulation become embarrassed, and the

blood loaded with carbon. They require food often, because the digestive organs are very active, and soon dispose of an ordinary meal. Then comes the sensation of hunger, which every one knows is hard to bear

The climate or temperature of the surrounding atmosphere has a wonderful effect on the animal machine. Let two horses be located in different stables, one of which shall be, like "Jack Straw's" house, neither wind-tight nor water-proof; the other built on the air-tight principle. The occupant of the former will require more food than he of the latter, because cold air has a depressing influence on the body, exhausting superficial heat. Our readers are probably aware that if a hot brick be placed in contact with a cold one, the caloric radiated from the first is absorbed by the latter, until a sort of equilibrium be established. The same is true as regards the body of a horse. He being in an atmosphere many degrees less than that of his own body, gives off the heat of the same to the surrounding medium. The heat thus given off has to be replaced by food, which is the combustible material. But it often happens that the digestive organs are deranged, incapable of assimilating a sufficiency of carbonaceous material to maintain even the normal temperature of the body. The consequences are, loss of flesh and health. On the other hand, a fat horse can endure the depressing influences of a cold atmosphere, because he has within the body a vast generator and non-conductor of heat in the form of fatty matter. It has been proved that the immediate cause of death in warm-blooded animals, when food has been withheld, was their inability to keep up that temperature necessary for the integrity of vital operations. The animal located in an air-tight stable is, probably, surrounded by an atmosphere almost equal in temperature to that of his own body, and, consequently, he does not require so much food as the former. Hence, the amount of food necessary in the one case might be too much for another, and, consequently, operate injuriously. A cold, bracing wind is said to "sharpen the appetite." The inhabitants of northern regions require more food than those of the southern. A horse, therefore, of weak muscular organization, the subject of debility, requires a comfortable stable, and food that will develope muscles. Now, it has been ascertained that horse beans contain more of the nitro albuminous principles than any other article of diet. English horses are very partial to the same, and in such the development of muscle is very remarkable; consequently a fat horse requires less of the nitro-albuminous principle, and more of the aqueous, in the form of carrots, potatoes and beets.

It must never be forgotten that some horses will keep in fair working order on a moderate supply of food. In such cases, we infer that the digestive organs are in a state of activity capable of extracting all the nutrient properties from the same. On the other hand, a horse performs less work than the former, consumes twice as much food, yet actually loses flesh. The digestive organs are then at fault. A horse, however, may lose flesh, become weak in the legs, etc., in consequence of the laborious nature of his employment,

therefore, any derangement occasioned in this way prevents the food from being converted into healthy chyme, chyle, or blood, and thus the necessary deposit of new matter is prevented.

Most voracious feeders are dyspeptic, and such are almost never free from intestinal worms. Their breath becomes feted; saliva, thick and tenacious; excrement, slimy; and should the subject be fed on oats, the same would be found, after traversing the alimentary canal, unmasticated. The principal remedy for indigestion is change in diet. Sometimes it may be proper to allow scalded oats, although cooking does not add to their nutritive quality, yet, more or less, completes the destruction of organization, and better prepares them for the action of weak insolvents.

Changes in diet will sometimes work wonders in the restoration of a dyspeptic; yet he will require, also, suitable medicinal agents, in view of augmenting the digestive function.

GOOD RULES FOR TELLING HORSES' AGES.

The full grown horse possesses twenty-four back teeth, that is six in each side of each jaw; these are called molars or grinders. He has twelve front teeth, that is, six in each jaw. Mares have no tushes. The foal has either at its birth, or shortly afterward eight milk teeth come in each jaw. These remain unchanged till he is three years old. The mouth of the yearling and two-year old cannot be confounded. The yearling mouth shows no signs of use, and the corner teeth are shells only; at two years old these teeth are strong and well grown, and the corner teeth filled up. A little before three years old the two centre teeth of each jaw fall out, and are replaced by permanent teeth. A little before the horse gets to be four years of age, the two teeth on each side of the centre are replaced by permanent ones. A little before five years of age, the two remaining teeth are shed, and in their place come permanent ones. The upper milk teeth are usually the ones to fall out first.

Thus the mouth is complete to its front teeth; the corner tooth, however, is but imperfectly developed, being at present a shell only; this shell at six years old has filled up, and is a complete tooth. This is the difference between a five and a six-year-old. The tushes appear between three and a half years and four years old, and they take nearly two years to arrive at their full growth. These teeth, as the horse grows older, get blunter and shorter, and so to an experienced judge are a sure indication of age. Up to six years old the mouth is in a distinct and periodical state of structural change. There is no difficulty in determining the age up to that date. After that the age must be judged by the shape of the mouth and the appearance of the teeth called the mark. At six years of age the cups leave two centre teeth above, at seven the next two above, and at eight the outer or corner teeth above.

At nine the two centre teeth below lose the cups, at ten the next two below, and at eleven the outer or corner teeth below. After a little practice the close observer can scarcely make a mistake, if he will occasionally examine the mouths of his horses, and pay close attention to the appearance the same will soon become impressed upon his mind. The changes that occur are very nearly the same in all horses, and the more attention one devotes to the matter the more you become impressed with the fact that the lesson is a very easy one to learn.

Horse Taming, etc.

The following sound advice is founded on the Rarey system of horse training :—

The horse is so constituted by nature that he will not offer resistance to any demand made of him which he fully comprehends. He has no consciousness of his strength beyond his own experience, and can be handled by man without force, after a little study of his habits and disposition. Being deficient in reasoning powers, he has no knowledge of right or wrong, of free will and independent government, and knows not of any imposition practiced upon him, however unreasonable it may be. Consequently, he cannot easily decide what he should or should not do. But being naturally of willing and gentle disposition, it remains for man to instruct him in a manner suited to his nature.

The horse is a timid animal; but easily becomes familiar with objects and sounds that are at first disagreeable or frightful. We must therefore accustom him to such as he will be apt to meet with in his daily service. To do this effectually, he should be allowed to examine closely and leisurely such objects as would inspire terror, and to smell them and touch them. A log or stump by the road-side may be, in the imagination of the horse, some great beast about to pounce upon him; but after you take him up to it, and let him stand by it a little while, and touch it with his nose, and go through his process of examination, he will not care anything more about it. And the same principle and process will have the same effect with any other object, however frightful in appearance, in which there is no harm.

I thus establish three principles on which my system of taming the horse is founded, viz. :

First. That any horse may be taught to do anything that a horse can do if taught in a systematic and proper manner.

Second. That a horse is not conscious of his own strength until he has resisted and conquered a man, and even in cases where he has temporarily triumphed he may yet be subdued;—that by taking advantage of man's reasoning powers a horse can be handled in such a manner that he shall not find out his strength.

Third. That by enabling a horse to examine every object with which we desire to make him familiar, with the organs naturally used for that pur-

pose, viz., *seeing*, *smelling*, and *feeling*, you may place or display the object around, over, and on him, provided that it does not actually hurt him or make him feel disagreeable.

With this introduction to first principles, I will endeavor to teach you how to put them into practice, and whatever instructions may follow, you can rely on as having been proven practical by actual experiments. Knowing from experience just what obstacles I have met with in handling bad horses, I shall try and anticipate them for you, and assist you in surmounting them, by commencing with the first step to be taken with the colt, and accompanying you through the whole task of breaking.

HOW TO GET THE COLT FROM PASTURE.

Go to the pasture and walk around the whole herd quietly, and at such distance as not to cause them to scare and run. Then approach them very slowly, and if they stick up their heads and seem to be frightened, hold on till they become quiet, so as not to make them run before you are close enough to drive them in the direction you want them to go. And when you begin to drive, do not flourish your arms or halloo, but gently follow them off, leaving the direction free for them that you wish them to take. Thus taking the advantage of their ignorance, you will be able to get them in the pound as easily as the hunter drives the quail into his net. For if they have always run in the pasture uncared for (as many horses do in prairie countries and on large plantations,) there is no reason why they should not be as wild as the sportsman's birds, and require the same gentle treatment, if you want to get them without trouble, for the horse, in his natural state, is as wild as any of the undomesticated animals, though more easily tamed than the rest of them.

HOW TO STABLE A COLT.

The next step will be to get the horse into a stable or shed. This should be done as quietly as possible, so as not to excite suspicion in the horse of any danger befalling him. The best way to do this, is to lead a broken horse into the stable first and hitch him, then quietly walk around the colt and let him go in of his own accord. Be extremely deliberate and slow in your movements, for one wrong move may frighten your horse, and make him think it necessary to escape at all hazards for the safety of his life —and thus make two hours' work of a ten minutes job; and this would be all your own fault, and entirely unnecessary—for he will not run unless you run after him, nor will he try to break away unless you attempt to force him into measures. If he does not see the way at once, and is a little fretful about going in, do not undertake to drive him, but give him a little less room outside, by gently closing in around him. Do not raise your arms, but let them hang at your side, for you might as well raise a club; the horse has never

studied anatomy, and does not know but they will unhinge themselves and fly at him. If he attempts to turn back, walk before him, but do not run; and if he gets past you, encircle him again in the same quiet manner, and he will soon find that you are not going to hurt him; and then you can walk so close around him that he will go into the stable for more room, and to get farther from you. As soon as he is in, remove the quiet horse and shut the door. This will be his first notion of confinement—not knowing how he got into such a place, nor how to get out of it. That he may take it as quietly as possible, see that the shed is entirely free from dogs, chickens, or anything that would annoy him. Then give him a handful of oats, and let him remain alone fifteen or twenty minutes, until he has examined his apartments and has become reconciled to his confinement. And now, while your horse is eating the handful of oats, see that your halter is ready and all right, and reflect upon the best mode of operations; for, in horse-breaking, it is highly important that you should be governed by some system.

THE KIND OF HALTER, AND HOW TO PUT IT ON.

Never use a rope halter. The cords of the rope are hard, and appear to aggravate and excite distrust rather than confidence; but by all means procure a leather halter made of bridle leather, so it will feel soft and pliable to the touch, and to fit tolerably tight on the head, so as not to feel uncomfortable. Before putting a halter upon a colt, he must be rendered familiar with it by caressing him, and permitting him to examine the article with his nose. Then place a portion of it over his head, occasionally giving it a slight pull, and in a few minutes he will be accustomed to these liberties, and then the halter may be fastened on properly. To teach him to lead is another difficulty. Stand a little on one side, rub his nose and forehead, take hold of the strap and pull gently, and at the same time touch him very lightly with the end of a long whip across his hind legs. This will make him start and advance a few steps. Repeat the operation several times, and he will soon learn to follow you by simply pulling the halter. The mouth of the colt should be frequently handled, after which introduce a plain snaffle between his teeth and hold it there with one hand and caress him with the other. After a while he will allow the bridle to be placed upon him. The saddle can now be brought in and rubbed against his nose, his neck and legs; next hang the stirrup strap across his back, and gradually insinuate the saddle into its place. The girth should not be fastened until he becomes thoroughly acquainted with the saddle. The first time the girth is buckled it should be done so loosely as not to attract his attention; subsequently it can be tightened without inspiring him with fear, which if fastened immediately it would most certainly do. In this manner the wildest colt can be effectually subjugated by such imperceptible degrees that he gives tacit obedience before he is aware of his altered condition.

HOW TO PROCEED AFTER HALTERING.

The first time you halter a colt you should stand on the left side, pretty well back to his shoulder, only taking hold of that part of the halter that goes around his neck, then with your two hands about his neck, you can hold his head to you, and raise the halter on it without making him dodge, by putting your hands about his nose. You should have a long rope or strap ready, and as soon as you have the halter on, attach this to it, so that you can let him walk the length of the stable without letting go of the strap, or without making him pull on the halter; for if you only let him feel the weight of your hand on the halter, and give him more rope when he runs from you, he will never rear, pull or throw himself, yet you will be holding him all the time, and doing more towards gentling him than if you had the power to snub him right up, and hold him to one spot; because he knows nothing about his strength, and if you don't do anything to make him pull, he will never know what he can do in that way. In a few minutes you can begin to control him with the halter, then shorten the distance between yourself and the horse by taking up the strap in your hand. As soon as he will allow you to hold him by a tolerably short strap, and to step up to him without flying back, you can begin to give him some idea about leading. But to do this, do not go before and attempt to pull him after you, but commence by pulling him very quietly to one side. He has nothing to brace either side of his neck, and will soon yield to a steady, gradual pull of the halter; and as soon as you have pulled him a step or two to one side, step to him and caress him, and then pull him again, repeating this operation until you can pull him in every direction, and walk about the stable with him; which you can do in a few minutes, for he will soon think when you have made him step to the right or left a few times, that he is compelled to follow the pull of the halter, not knowing that he has the power to resist your pulling; besides, you have handled him so gently that he is not afraid of you, but rather likes you. After you have given him a few lessons of this kind, at proper intervals, he will be so tame that if you turn him out to pasture he will come to you to be caressed every opportunity he gets.

While training him in the stable, you should lead him about some time before taking him out, opening the door, so that he can see out, leading him up to it and back again, and then past it. See that there is nothing on the outside to make him jump when you take him out, and as you go out with him, try to make him go very slowly, catching hold of the halter close to the jaw with your left hand, while the right is resting on the top of his neck, holding to his mane. Do not allow any one to be present or in sight, during your operations, either in or outside the stable. If you are entirely alone, and manage your colt rightly, you will soon be able to lead and hold him as easily as you could a horse already broken.

HOW TO PROCEED IF THE COLT IS STUBBORN.

If the animal you are operating upon seems to be stubborn or *mulish* disposition rather than wild; if he lay back his ears as you approach him, or turns his heels to kick you, he has not that regard or fear of man that he should have, to enable you to handle him quickly and easily; and it might do well to give him a few sharp cuts with the whip, about the legs pretty close to the body. It will crack keen as it plies about the legs, and the crack of the whip will affect him as much as the stroke; besides, one sharp cut about the legs will affect him more than two or three over the back, the skin on the inner part of the legs or about his flanks being thinner, and more tender than on his back. But do not whip him much—just enough to scare him; it is not because we want to hurt the horse that we whip him; we only do it to scare the bad disposition out of him. But whatever you do, do quickly, sharply, and with a good deal of fire, but always without anger. If you go to scare him at all, you must do it at once. Never go into a pitched battle with your horse, and whip him until he is mad, and will fight you; you had better not touch him at all, for you will establish, instead of fear and regard, feelings of resentment, hatred, and ill will. It will do him no good, but harm, to strike him, unless you can frighten him; but if you can succeed in frightening him, you can whip him without making him mad; for fear and anger never exist together in the horse, and as soon as one is visible, you will find that the other has disappeared. As soon as you have frightened him, so that he will stand up straight and pay some attention to you, approach him again and caress him a good deal more than you whipped him; thus you will excite the two controlling passions of his nature, love and fear; he will love, and fear you too; and, as soon as he learns what you require, will obey quickly.

If the colt is of too mulish a disposition to yield to careful and gentle treatment, as here given, you must resort to the several measures recommended for taming vicious horses, as explained elsewhere in these pages.

HOW TO LEAD A COLT WITH A BROKE HORSE.

If you should want to lead your colt by the side of another horse, you must first put the horse into a stable with the colt. You now attach a second strap to the colt's halter, and lead your horse up alongside of him. Then get on the broke horse and take one strap around his breast under the martingale, (if he has any on), holding it in your left hand. This will prevent the colt from getting back too far; besides, you have more power to hold him, with the strap pulling against the horse's breast. The other strap take up in your right hand to prevent him running ahead; then turn him about in the stable, and if the door is wide enough, ride out with him in that position; if not, take the broke horse out first, and stand his breast up against the door, then lead the colt to the same spot and take the straps as before directed, one on

each side of his neck, and then let some one start the colt out, and as the colt comes out, turn your horse to the left, and you will have them all right. You can manage any kind of a colt in this way, without trouble ; for, if he tries to run ahead, or pull back, the two straps will bring the two horses facing each other, so that you can very easily follow up his movements without doing much holding, and as soon as he stops running backward, you are right with him, and all ready to go ahead. If he gets stubborn and does not want to go, you can remove all his stubbornness by riding your horse against his neck, thus compelling him to turn to the right ; and as soon as you have turned him about a few times, he will be willing to go along. The next thing, after you are through leading him, will be to take him into a stable and hitch him in such a way as not to have him pull on the halter, and as they are often troublesome to get into a stable the first few times, I will give you some instructions about getting him in.

HOW TO LEAD THE COLT INTO A STABLE.

You should lead the broken horse into the stable first, and get the colt, if you can, to follow in after him. If he refuses to go, step up to him, taking a little stick or switch in your right hand ; then take hold of the halter close to his head with your left hand, at the same time reaching over his back with your right arm so that you can tap him on the opposite side with your switch, reaching as far back with it as you can. This tapping, by being pretty well back, and on the opposite side, will drive him ahead, and keep him close to you ; then by giving him the right direction with your left hand you can walk into the stable with him. I have walked colts into the stable in this way in less than a minute, after men had worked at them half an hour, trying to pull them in. If you cannot walk him in at once in this way, turn him about and walk him around awhile until you can get him up to the door without pulling at him. Then let him stand a few minutes, keeping his head in the right direction with the halter, and he will soon walk in of his own accord. Never attempt to pull the colt into the stable; that would make him think at once that it was a dangerous place, and if he was not afraid before he would be then. Besides, we do not want him to know anything about pulling on the halter. If you want to tie up your colt, put him in a tolerably wide stall, which should not be too long, and should be connected by a bar or something of that kind to the partition behind it ; so that, after the colt is in he cannot go far enough back to take a straight, backward pull on the halter ; then by tying him in the center of the stall, it would be impossible for him to pull on the halter, the partition behind preventing him from going back, and the halter in the center checking him every time he turns to the right or left. In a stall of this kind you can break any horse to stand tied with a light strap, anywhere, without his ever knowing anything about pulling. For if you have broken your horse to lead, and have taught

him the use of the halter (which you should always do before you hitch him to anything), you can hitch him in any kind of a stall, and if you give him something to eat to keep him up to his place for a few minutes at first, there is not one colt in fifty that will pull on his halter, or ever attempt to do so.

This is an important feature in breaking the colt, for if he is allowed to pull on the halter at all, and particularly if he finds out that he can break the halter, he will never be safe.

THE KIND OF BIT TO USE, AND HOW TO USE IT.

In first accustoming a colt to the bit, you should use a large, smooth snaffle, so as not to hurt his mouth, with a bar at each side to prevent it from pulling through either way. This should be attached to the head-stall of your bridle, and put it on your colt without any reins to it, and let him run loose in a large stable or shed, some time, until he becomes a little used to the bit, and will bear it without trying to get it out of his mouth. Repeat this several times, before you do anything more with the colt; and as soon as he will bear the bit, attach a single rein to it, without any martingale. You should also have a halter on your colt, or a bridle made after the fashion of a halter, with a strap to it, so that you can hold or lead him about without pulling much on the bit.

Farmers often put bitting harness on a colt the first thing they do to him, buckling it on as tight as they can draw it, to make him carry his head high, and then turn him out in a lot, to run half a day at a time. This is one of the very worst punishments they can inflict on a colt, and is very injurious to a young horse that has been used to running in pasture with his head down. I have seen colts so injured in this way that they never got over it.

A horse should be well accustomed to the bit before you put on the bitting harness, and when you first bit him you should only rein his head up to the point where he naturally holds it, let that point be high or low; he will soon learn that he cannot lower his head, and that raising it a little will loosen the bit in his mouth. This will give him an idea of raising his head to loosen the bit; and then you can draw the bitting a little tighter every time you put it on, and he will still raise his head to loosen it. By this means you will gradually get his head and neck in the position you want him to carry it, and give him a nice and graceful carriage without hurting him, making him mad, or causing his mouth to get sore. Horses that have their heads drawn up tightly, should not have the bitting on more than fifteen minutes at a time.

HOW TO SADDLE A COLT.

Any one man who has this theory, can put a saddle on the wildest horse that ever grew, without any help, and without scaring him. The first thing will be to tie each stirrup strap into a loose knot, to make them short and

prevent the stirrups from flying about and hitting him. Then double up the skirts and take the saddle under your right arm, so as not to frighten him with it when you approach. When you get to him, rub him gently a few times with your hand, then raise the saddle very slowly, until he can see it, and smell, and feel it with his nose. Then let the skirts loose, and rub it very gently against his neck the way the hair lays, letting him hear the rattle of the skirts as he feels them against him; each time a little further backward, and finally slip it over his back. Shake it a little with your hand, and in less than five minutes you can rattle it about over his back as you please, and pull it off and throw it on again, without his paying much attention to it.

As soon as you have accustomed him to the saddle, fasten the girth. Be careful how you do this. It often frightens the colt when he feels the girth binding him, and making the saddle fit tight on his back. You should bring up the girth very gently, and not draw it too tight at first, just enough to hold the saddle on. Move him a little, and then girth it as tight as you choose, and he will not mind it.

You should see that the pad of your saddle is all right before you put it on, and that there is nothing to make it hurt him, or feel unpleasant to his back. It should not have any loose straps on the back part of it, to flap about and scare him. After you have saddled him in this way, take a switch in your right hand to tap him up with, and walk about in the stable a few times with your right arm over your saddle, taking hold of the reins on each side of his neck with your right and left hands, thus marching him about in the stable until you teach him the use of the bridle and can turn him about in any direction, and stop him by a gentle pull of the rein. Always caress him, and loose the reins a little every time you stop him.

You should always be alone, and have your colt in some light stable or shed the first time you ride him; the loft should be high, so that you can sit on his back without endangering your head. You can teach him more in two hours' time in a stable of this kind, than you could in two weeks in the common way of breaking colts, out in an open place. If you follow my course of treatment, you need not run any risk, or have any trouble in riding the worst kind of horse. You take him a step at a time, until you get up a mutual confidence and trust between yourself and horse. First teach him to lead and stand hitched; next acquaint him with the saddle, and the use of the bit; and then all that remains is to get on him without scaring him, and you can ride him as well as any horse.

HOW TO MOUNT THE COLT.

First gentle him well on both sides, about the saddle and all over, until he will stand still without holding, and is not afraid to see you anywhere about him. As soon as you have him well gentled, get a small block about one

foot or eighteen inches in height, and set it down by the side of him, about where you want to stand to mount him; step up on this, raising yourself very gently. Horses notice every change of position very closely, and if you were to step up suddenly on the block, it would be very apt to scare him; but by raising yourself gradually on it, he will see you without being frightened, in a position very near the same as when you are on his back. As soon as he will bear this without alarm, untie the stirrup strap next to you, and put your left foot in the stirrup, and stand square over it, holding the knee against the horse, and your toe out, so as to touch him under the fore-shoulder with the toe of your boot. Place your right hand on the front of the saddle, and on the opposite side of you, taking hold of a portion of the mane and reins (they hang loosely over his neck), with your left hand, then gradually bear your weight on the stirrup, and on your right hand, until the horse feels your whole weight on the stirrup; repeat this several times, each time raising yourself a little higher from the block, until he will alow you to raise your leg over his croup, and place yourself in the saddle. Another, and in some cases a better way of mounting, is to press the palm of your right hand on the off-side of the saddle, and as you rise lean your weight on it. By this means you can mount with the girths loose, or without any girths at all.

There are three great advantages in having a block to mount from. First, a sudden change of position is very apt to frighten a young horse that has never been handled; he will allow you to walk to him, and stand by his side without scaring at you, because you have gentled him to that position; but if you get down on your hands and knees and crawl towards him, he will be very much frightened; and upon the same principle, he would frighten at your new position if you had the power to hold yourself over his back without touching him. Then the first great advantage of the block is to gradually gentle him to that new position in which he will see you when you ride him. Secondly, by the process of holding your weight in the stirrups, and on your hand, you can gradually accustom him to your weight, so as not to frighten him by having him feel it all at once. And, in the third place, the block elevates you so that you will not have to make a spring in order to get on the horse's back, but from it you can gradually raise yourself into the saddle. When you take these precautions, there is no horse so wild but what you can mount him without making him jump. I have tried it on the worst horses that could be found, and have never failed in any case. When mounting, your horse should always stand without being held. A horse is never well broke when he has to be held with a tight rein when mounting; and a colt is never so safe to mount as when you see that assurance of confidence, and absence of fear, which cause him to stand without holding.

HOW TO RIDE THE COLT.

When you want him to start, do not touch him on the side with your heel,

or do anything to frighten him and make him jump. But speak to him kindly; and if he does not start, pull him a little to the left until he starts, then let him walk off slowly with the reins loose. Walk him around in the stable a few times until he gets used to the bit, and you can turn him about in every direction and stop him as you please. It will be well to get on and off a good many times until he gets perfectly used to it before you take him out of the stable. After you have trained him in this way, which should not take more than two or three hours, you can ride him anywhere you choose without ever having him jump or make an effort to throw you.

When you first take him out of the stable, be very gentle with him, as he will feel a little more at liberty to jump or run, and be easier frightened than he was while in the stable: but you will nevertheless find him pretty well broke, and will be able to manage him without trouble or danger.

When you first mount a colt, take a little the shortest hold on the left rein, so that if anything frightens him, you can prevent him from jumping by pulling his head around to you. This operation of pulling a horse's head around against his side, will prevent him from jumping ahead, rearing up, or running away. If he is stubborn and will not go, you can make him move by pulling his head around to one side, when whipping him would have no effect. And turning him around a few times will make him dizzy, and then by letting him have his head straight, and giving him a little touch with the whip, he will go along without any trouble.

Never use martingales on a colt when you first ride him; every movement of the hand should go right to the bit in the direction in which it is applied to the reins, without a martingale to change the direction of the force applied. You can guide the colt much better without it, and teach him the use of the bit in much less time. Besides, martingales would prevent you from pulling his head around if he should try to jump.

After your colt has been ridden until he is gentle and well accustomed to the bit, you may find it an advantage, if he carries his head too high or his nose too far out, to put martingales on him.

You should be careful not to ride your colt so far at first as to heat, worry, or tire him. Get off as soon as you see he is a little fatigued; gentle him and let him rest; this will make him kind to you, and prevent him from getting stubborn or mad.

TO BREAK A HORSE TO HARNESS.

Take him in a light stable, as you did to ride him; take the harness and, go through the same process that you did with the saddle, until you get him familiar with them, so you can but them on his back and rattle them about without his caring for them. As soon as he will bear them, put on the lines, caress him as you draw them over him, and drive him about in the stable till he will bear them over his hips. The lines are a great aggravation to some

colts, and often frighten them as much as if you were to raise a whip over them. As soon as he is familiar with the harness and lines, take him out and put him by the side of a gentle horse, and go through the same process that you did with the balking horse. Always use a bridle without blinds when you are breaking a horse to harness.

HOW TO HITCH A HORSE IN A SULKY.

Lead him to and around it; let him look at it, touch it with his nose, and stand by it until he does not care for it; then pull the shafts a little to the left, and stand your horse in front of the off wheel. Let some one stand on the right side of the horse and hold him by the bit, while you stand on the left side, facing the sulky. This will keep him straight. Run your left hand back and let it rest on his hip, and lay hold of the shafts with your right, bringing them up very gently to the left hand, which still remains stationary. Do not let anything but your arm touch his back, and as soon as you have the shafts square over him, let the person on the opposite side take hold of one of them, and lower them very gently to the shaft bearers. Be very slow and deliberate about hitching; the longer time you take the better, as a general thing. When you have the shafts placed, shake them slightly, so that he will feel them against each side. As soon as he will bear them without scaring, fasten your braces, etc., and start him along very slowly. Let one man lead the horse to keep him gentle, while the other gradually works back with the lines till he can get behind and drive him. After you have driven him in this way a short distance, you can get into the sulky, and all will go right. It is very important to have your horse go gently when you first hitch him. After you have walked him awhile, there is not half so much danger of his scaring. Men do very wrong to jump up behind a horse to drive him as soon as they have him hitched. There are too many things for him to comprehend all at once. The shafts, the lines, the harness, and the rattling of the sulky, all tend to scare him, and he must be made familiar with them by degrees. If your horse is very wild, I would advise you to put up one foot the first time you drive him.

TAMING A HORSE WITH VICIOUS HABITS.

Having given full instructions relative to the system of dealing with young colts, I will now proceed to detail the plan of operations for taming or subduing wild or vicious horses. The principles of this method are the same as those in managing colts—kindness and gentleness—but the practice differs. When you desire to subdue a horse that is very wild, or has a vicious disposition, take up one fore-foot and bend his knee till his hoof is bottom upwards, and nearly touching his body; then slip a loop over his knee, and shove it up until it comes above the pastern-joint, to keep it up, being careful to draw the loop together between the hoof and pastern-joint with a second strap of

ome kind to prevent the loop from slipping down and coming off. This will leave the horse standing on three legs; you can now handle him as you wish, for it is utterly impossible for him to kick in this position. There is something in this operation of taking up one foot, that conquers a horse quicker and better than anything else you can do to him; and there is no process in the world equal to it to break a kicking horse, for by conquering one member, you conquer, to a great extent, the whole horse.

You can do anything you wish with the horse in this condition, as when he becomes convinced of his incapacity to cope with man, he will abandon all antagonistic demonstrations, and become willing to obey, and generally docile. Operate on your horse in this manner as often as the occasion requires, and you will soon find him as gentle as his nature will permit him to be. By these means the most vicious, uneasy, unruly or fretful horse may be cured, though it depends upon the age and disposition of the animal how long it will take to make him amiable. When you first fasten up a horse's foot, he will sometimes get very mad, and strike with his knee, and try every possible way to get it down; but as he cannot do that, he will soon give it up.

Conquering a horse in this manner is better than anything else you could do, and leaves him without any possible danger of hurting himself or you either; for after you have tied up his foot, you can sit down and look at him until he gives up. When you find he is conquered, go to him, let down his foot, rub his leg with your hand, carress him, and let him rest a few minutes; then put it up again. Repeat this a few times, always putting up the same foot, and he will soon learn to travel on three legs, so that you can drive him some distance. As soon as he gets a little used to this way of traveling, put on your harness and hitch him to a sulky. If he is the worst kicking horse that ever raised a foot, you need not be fearful of his doing any damage while he has one foot up; for he cannot kick, neither can he run fast enough to do any harm. And if he is the wildest horse that ever had harness on, and has run away every time he has been harnessed, you can now hitch him to a sulky and drive him as you please. If he wants to run, you can let him have the lines, and the whip too, with perfect safety; for he can go but a slow gait on three legs, and will soon be tired and ready to stop; only hold him enough to guide him in the right direction, and he will soon be tired and willing to stop at the word. Thus you will effectually cure him at once of any furthor notion of running off. Kicking horses have always been the dread of everybody; you always hear men say, when they speak about a bad horse, "I don't care what he does, so he don't kick." This new mode is an effectual cure for that worst of all habits. There are plenty of ways by which you can hitch a kicking horse, and force him to go, though he kicks all the time; but this don't have any good effect towards breaking him, for we know that horses kick because they are afraid of what is behind them, and when they kick against it and it hurts them, they only kick the

harder; and this will hurt them still more and make them remember the scrape much longer, and make it still more difficult to persuade them to have any confidence in anything dragging behind them ever after. But by this new method you can harness them to a rattling sulky, plow, wagon, or anything else in its worst shape. They may be frightened at first, but cannot kick or do anything to hurt themselves, and will soon find that you do not intend to hurt them, and then they will not care anything more about it. You can then let down the leg and drive along gently without any further trouble. By this new process a bad kicking horse can be learned to go gentle in harness in a few hours' time

HOW TO MAKE A HORSE LIE DOWN.

Everything that we want to teach the horse must be commenced in such a way as to give him an idea of what we want him to do, and then be repeated till he learns it perfectly. To make a horse lie down, bend his left fore-leg and slip a loop over it, so that he cannot get it down. Then put a surcingle around his body, and fasten one end of a long strap around the other fore-leg, just above the hoof. Place the other end under the before-described surcingle, so as to keep the strap in the right direction; take short hold of it with your right hand; stand on the left side of the horse; grasp the bit in your left hand, pull steadily on the strap with your right; bear against his shoulder till you cause him to move. As soon as he lifts his weight, your pulling will raise the other foot, and he will have to come on his knees. Keep the strap tight in your hand, so that he cannot straighten his leg if he rises up. Hold him in this position, and turn his head towards you; bear against his side with your shoulder, not hard, but with a steady, equal pressure, and in about ten minutes he will lie down. As soon as he lies down, he will be completely conquered, and you can handle him as you please. Take off the straps, and straighten out his legs; rub him lightly about the face and neck with your hand the way the hair lies; handle all his legs, and after he has lain ten or twenty minutes, let him get up again. After resting him a short time, make him lie down as before. Repeat the operation three or four times, which will be sufficient for one lesson. Give him two lessons again, and when you have given him four lessons, he will lie down by taking hold of one foot. As soon as he is well broken to lie down in this way, tap him on the opposite leg with a stick when you take hold of his foot, and in a few days he will lie down from the mere motion of the stick.

TREATMENT OF THE HORSE AFTER HE IS DOWN.

If the horse has fought hard in going down, he will then usually lie perfectly still, and you can gentle him, scrape the sweat off, and rub him down, smoothing the hair of his legs, and drawing the fore one straight out. In this position you have the opportunity of making him perfectly familiar with

you, and the more you fondle him and reconcile him to you the better. If you are treating an unbroken colt in this way, you may now mount his back, and thus, by finding out that you mean him no harm, he will learn to submit to being mounted when he stands up. You can also lay a saddle or harness on him and familiarize him with those articles. His head, tail and legs should now be handled with freedom, caressing and talking to him all the while. If he has hitherto resisted shoeing, handle all his legs with a view to accomplish it, and if he attempts to resist, continue until you subdue him, speaking to him with a voice of authority. If he is a bad kicker you may be obliged to confine his fore-legs; and with those tied, you may spend an hour in handling his legs, tapping the hoofs with your hand or a hammer—all this to be done in a firm, measured, soothing manner; only now and then, if he resist, crying, as you paralyze him with the ropes, "Wo!" in a determined manner. It is by this continual soothing and handling that you establish confidence between the horse and yourself. After patting him as much as you deem needful, say for ten minutes or a quarter of an hour, you may encourage him to rise. Some horses will require a good deal of helping, and it may be necessary to draw out their fore-legs before them. The handling of the limbs of colts in this condition, particularly requires caution. A colt tormented by flies will kick forward nearly up to the fore-legs. If a horse, unstrapped, attempts to rise, you may easily stop him by taking hold of a fore-leg and doubling it back to the strapped position. If by chance he should be too quick, don't resist, for it is an essential principle of this system never to enter into a contest with a horse unless you are certain to be victorious. In all these operations you must be calm, and never be in a hurry, or in a passion.

The principle established by this mode of treatment is that you show no violence to frighten the horse, and yet you force him to submit to your will, caressing him when he assents and gently forcing him when he does not. Repeated lessons will convince the most vicious horse that you are his master, and your gentle caresses consequent on his submission will at the same time give him confidence in you. It has been suggested that a novice should begin his practice on a gentle horse that he can handle at pleasure, and the plan is a good one. He may thus become familiar with the process before trying it, in earnest, on a vicious or unbroken animal.

A singular fact in illustration of the beauty of this treatment of refractory horses is mentioned in an English periodical. A beautiful gray mare, which had been fourteen years in the band of one of the Life Guards regiments, and consequently at least seventeen years old, would never submit quietly to have her hind legs shod; the farriers had to put a twitch on her nose and ears, and tie her tail down; even then she resisted violently. After three days' treatment similar to that above described, she was easily shod with her head loose. And this was not done by a trick, but by proving to her that

she could not resist even to the extent of an inch, and that no harm was intended her.

HOW TO MANAGE BALKY HORSES.

Horses know nothing about balking until they are forced into it by bad management. When a horse baulks in harness, it is generally from some mismanagement, excitement, or confusion or from not knowing how to pull, but seldom from any unwillingness to perform all that he understands. High-spirited free-going horses are the most subject to balking, and only so because drivers do not properly understand how to manage this kind. A free horse in a team may be so anxious to go, that when he hears the word he will start with a jump, which will not move the load, but give him so severe a jerk on the shoulders that he will fly back and stop the other horse. The teamster will continue his driving without any cessation, and by the time he has the slow horse started again, he will find that the free horse has made another jump, and again flown back. And now he has them both badly balked, and so confused that neither of them knows what is the matter, or how to start the load. Next will come the slashing and cracking of the whip, and hallooing of the driver, till something is broken, or he is through with his course of treatment. But what a mistake the driver commits by whipping his horse for this act! Reason and common sense should teach him that the horse was willing and anxious to go, but did not know how to start the load. And should he whip him for that? If so, he should whip him again for not knowing how to talk. A man that wants to act with reason should not fly into a passion, but should always think before he strikes. It takes a steady pressure against the collar to move a load, and you cannot expect him to act with a steady, determined purpose while you are whipping him. There is hardly one balking horse in five hundred that will pull truly from whipping; it is only adding fuel to fire, and will make him more liable to balk another time. You always see horses that have been balked a few times, turn their heads and look back as soon as they are a little frustrated. This is because they have been whipped, and are afraid of what is behind them. This is an invariable rule with balky horses, just as much as it is for them to look around at their sides when they have the bots; in either case they are deserving of the same sympathy, and the same kind of rational treatment.

When your horse balks, or is a little excited, or if he wants to start quickly, or looks around and don't want to go, there is something wrong and he needs kind treatment immediately. Caress him kindly, and if he don't understand at once what you want him to do, he will not be so much excited as to jump and break things, and do everything wrong through fear. As long as you are calm, and can keep down excitement of the horse, there are ten chances to have him understand you, where there would not be one under harsh

treatment; and then the little *flare up* would not carry with it any unfavorable recollections and he would soon forget all about it, and learn to pull true. Almost every wrong act the horse commits is from mismanagement, fear or excitement; one harsh word will so excite a nervous horse as to increase his pulse ten beats in a minute.

When we remember that we are dealing with dumb brutes, and reflect how difficult it must be for them to understand our motions, signs and language, we should never get out of patience with them because they don't understand us, or wonder at their doing things wrong. With all our intellect if we were placed in the horse's situation, it would be difficult for us to understand the driving of some foreigner, of foreign ways and foreign language. We should always recollect that our ways and language are just as foreign and unknown to the horse as any language in the world is to us; and should try to practice what we could understand were we the horse, endeavoring by some simple means to work on his understanding rather than on the different parts of his body. All balked horses can be started true and steady in a few minutes' time; they are willing to pull as soon as they know how; and I never yet found a balked horse that I could not teach to start his load in fifteen, and often in less than three minutes' time.

Almost any team, when first balked, will start kindly if you let them stand five or ten minutes, as though there was nothing wrong, and then speak to them with a steady voice, and turn them a little to the right or left so as to get them both in motion before they feel the pinch or the load. But if you want to start along a team that you are not driving yourself, that has been balked, fooled, and whipped for some time, go to them and hang the lines on their hames, or fasten them to the wagon, so that they will be perfectly loose; make the driver and spectators, if there are any, stand off some distance to one side, so as not to attract the attention of the horses; unloose their check reins, so that they can get their heads down, if they choose; let them stand a few minutes in this condition, until you can see that they are a little composed. While they are standing you should be about their heads gentling them; it will make them a little more kind, and the spectators will think you are doing something that they do not understand, and will not learn the secret. When you have them ready to start, stand before them, and as you seldon have but one balky horse in a team, get as near in front of him as you can, and if he is too fast for the other horse, let his nose come against your breast; this will keep him steady, for he will go slow rather than run on you; turn them gently to the right, with the wagon; have it stand in a favorable position for starting out, letting them pull on the traces as far as the tongue will let them go; stop them with a kind word, gentle them a little, and turn them back to the left by the same process. You will have them under your control by this time, and as you turn them again to the right, steady them in the collar, and you can take them where you please.

There is a quicker process that will generally start a balky horse, but not so sure. Stand him a little ahead, so that his shoulder will be against the collar, and then take up one of his fore feet in your hand, and let the driver start them, and when the weight comes against his shoulders, he will try to stop—then let him have his foot, and he will go right along. If you want to break a horse from balking that has long been in that habit, you ought to set a day apart for that purpose. Put him by the side of some steady horse; have check lines on them; tie up all the traces and straps, so that there will be nothing to excite them; do not rein them up, but let them have their heads loose. Walk them about together for some time as slowly and lazily as possible; stop often and go up to the balky horse and gentle him, but keep him just as quiet as you can. He will soon learn to start off at the word, and stop when you tell him.

As soon as he performs right, hitch him to an empty wagon. It would be well to shorten the stay chain behind the steady horse, so that if it is necessary he can take the weight of the wagon the first time you start them. Do not drive but a few rods at first; watch your balky horse closely, and if you see that he is getting excited, stop him before he stops of his own accord, caress him a little, and start again. As soon as they go well, drive them over a small hill a few times, and then over a large one, occasionally adding a little load. This process will make any horse true to pull.

GENERAL RULES, AND REMARKS.

In taming the horse by any of the processes here given, the following rules should be observed. First—When forcing down the horse be careful of his neck. Do not let him fall upon that, or he may break it, as the spine of the horse is easily broken. Second—Do not force him down violently under any circumstances. The way to get him down is by patiently working with him and waiting until he goes down easily. Thirdly—Keep him very quiet by stroking or patting him with your hand in a gentle and delicate manner, until he is entirely over the excitement which your operations have caused in him. You can generally tell when he is appeased by the expression of his eyes. Fourthly—In backing the horse never use violence. Hold the halter and off rein in your left hand, while managing him to bring him down.

In teaching a horse to to follow you, and in curing him of kicking or biting, or balking, or indeed any bad habit, the choking operation is resorted to with equal success as in the case of taming or breaking. If he contiues stubborn, you have only to repeat the operation, giving him one or two lessons a day, and in a short time he will be perfectly subdued. A young horse learns to obey quicker than an older one. When you get a horse down by any of the processes we have mentioned, a quarter of an hour or twenty minutes is ample time to keep him prostrate for the purpose of subjugation.

Breathing into a horse's nostrils when he is down is practiced by some horse-tamers, and this is undoubtedly a soothing operation, as it brings you into close contact with the animal, thus giving him an opportunity of examining you with his nose—a process peculiar to horses. You should always litter your stable well when you perform these operations of flooring the horse. Clean straw or tanbark, or anything to make a soft stable bottom will answer.

HOW TO MAKE A HORSE FOLLOW YOU.

Turn him out into a large stable or shed, where there is no chance to get out, with a halter or bridle on. Go to him and gentle him a little; take hold of the halter and turn him towards you, at the same time touching him lightly over the hips with a long whip. Lead him the length of the stable, rubbing him on the neck, saying, in a steady tone of voice, as you lead him, "Come along, my boy!" or use his name instead of my boy, if you choose. Every time you turn, touch him slightly with the whip, to make him step up to you, and then caress him with your hand. He will soon learn to hurry up to escape the whip, and be caressed, and you can make him follow you around without taking hold of the halter. If he should stop and turn from you, give him a few sharp cuts about the hind legs, and he will soon turn his head towards you, when you must always caress him. A few lessons of this kind will make him run after you, when he sees the motion of the whip—in twenty or thirty minutes he will follow you around the stable. After you have given him two or three lessons in the stable, take him in a small lot and train him; and from thence you can take him into the road, and make him follow you anywhere, and run after you.

TO MAKE A HORSE STAND WITHOUT HOLDING.

After you have well broken him to follow you, stand him in the center of the stable—begin at the head to caress him, and gradually work backwards, If he moves, give him a cut with the whip, and put him back to the same spot from where he started. If he stands, caress him as before, and continue gentling him in this way until you can get around him without making him move. Keep walking round him, increasing your pace, and only touch him occasionally. Enlarge your circle as you walk around, and if he then moves, give him another cut with the whip, and put him back to his place. If he stands, go to him frequently and caress him, and then walk round him again. Do not keep him in one position too long at a time, but make him come to you occasionally, and follow you around the stable. Then stand him in another place, and proceed as before. You should not train him more than half an hour at a time.

TO PREVENT A HORSE FROM SCARING.

This process is very simple. Whenever a horse scares at objects on going

along the road, always stop him, and let him face the object. Lead him slowly towards it, and let him touch it with his nose. Take the pains to do this on every occasion, and it will soon break him entirely. If your horse is frightened at an umbrella, you can soon learn him to be used to that. Go into the stable with him, and first let him look at the umbrella before it is opened—let him touch it with his nose. Open it a little way, and then let him see it, and finally open it wide. By ordinary patience you can soon learn the horse to have the umbrella opened suddenly in his face, without his being afraid of it. By a similar treatment you can break any horse from scaring at almost anything that may look frightful to him. If you wish to make a trial of this theory, just take a horse into the stable, and let him examine the frightful object a few minutes, after his mode of examining things, and you will be perfectly satisfied. There is a singular fact connected with taming the horse that I would have never believed if I had not tried it. If you accustom him to any particular object by showing it to him one side only, he will not be afraid when he sees it with the eye on that side, but he will be afraid if you approach him with it on the other side. It is therefore necessary to pacify him on both sides in all cases. After you have accustomed him to the umbrella, or whatever you may wish to make him familiar with, on his right side, repeat the operation on the left side in the same manner as if you had not approached him at all.

How to Develop Speed.

For the benefit of those who own a colt that gives promise of being a speedy one if only properly developed we herewith furnish a few hints that will be found of good service.

The expense entailed by putting a young horse into the hands of a professional trainer is greater than the majority of owners care to incur, and in many cases we have known horses spoiled by men who professed to be masters of their business, but who in reality were either too lazy or too ignorant to give the necessary care and attention.

It is an admitted fact that the posession of trotting speed adds vastly to the money value of a horse, and here in Canada there have been hundreds of illustrations of the statement that speed commands money. Only in February of this year Mr. Julien, of Port Dalhousie, Ont., sold a five-year-old mare by General Stanton for $1,400. This mare is only about 15 hands high, and had it not been for the speed she showed herself possessed of, she would not have fetched $200 in any horse market in the country. Here then was a fair sample case where $1,200 extra money was realized by the owner simply because his mare proved her ability at Newcastle races to trot a mile better than 2.40.

Now without any desire to reccommend farmers to go in for breeding trotters, we do strongly recommend them to breed to good stallions, and when they have decided to breed for the purpose of securing a driving horse they had a great deal better pay a fair price and secure the services of a really well bred stallion likely to supply the sort of colt they want, than by paying a cheap price, breed to some mongrel whose "get" are sure to be as worthless as their sire. If a suitable horse is not located in your immediate neighborhood it will pay you well for the extra cost and labor to send your mares a good many miles to reach the proper sort of horse.

Presuming that such common sense ideas have ruled your conduct in the past, and that you have on the farm a youngster that gives evidence of being troubled a little with speed, it is not necessary that you should go to any

expense to develop that speed, and the time employed in the work will in many cases be time most profitably spent. Don't, however, waste any time over a dunghill, a colt by a mongrel bred horse out of a mongrel bred mare is of no account, and time spent in training such stock is time thrown away to little purpose.

We will take it for granted that your horse is broken or has been driven in harness; if your colt has never been driven he may be worth more than if he had been handled by some of the self-styled horse breakers. In the first place, don't do anything to the young horse to shake his confidence in mankind, but try and cultivate his confidence and respect. As good a way to gentle green colts—three, or even four years old—is to tie them in a stall in a barn with other horses and treat them just the same, viz.: feed, water, bed, groom and go through the whole business with them until they become accustomed to the noise, and having people around them. They will in a couple of weeks become perfectly docile. If you have got a good driving pole horse, hitch the colt in with him, to some light running vehicle, having first had a harness on him a few times and a bit in his mouth, and if he has had the proper kind of treatment around the stable it is a hundred to one he will go off readily, and by the time he has been driven a mile he will act like a horse; don't drive him too far, two or three miles is far enough the first time. Keep driving him every day carefully. But if you have not got a good driving pole horse, hitch the colt to a skeleton wagon or light gig and get up behind him just as though he had been driven before. Make him think he is a horse, and above all don't fight him, and don't try to pull his head up too high unless you know he is going to kick. Get him to do what he does cheerfully and you will have a better broken horse in two weeks than half the old ones are.

SHOEING, FEEDING AND WATERING.—The colt should be shod if worked on dirt roads, and if snow or ice prevail shoe him all around sharp, so he can stand up. Don't shoe him too heavy, a twelve or thirteen ounce shoe in front and an eight ounce shoe behind is heavy enough. If you don't know how to have him shod, go to the best and most intelligent blacksmith you know and tell him you want him shod just as well as he would shoe a trotter, and pay him what he asks, if he is a man of judgment and experience in this kind of shoeing.

In regard to feeding, which is a very important part of our undertaking: A three-year-old that you intend to work a little ought to have at least eight quarts of oats a day and what hay he will eat up in an hour, say at night. If you are going to make a practice of driving him early in the morning, give him two quarts of oats and a little water before you hitch him up; it will stay his stomach and he will feel more like going out. But if you don't work him until late in the forenoon, give him his full feed, three quarts,

about six o'clock in the morning, and a little hay. In respect to feeding hay, or grain either, no man can lay down any rule as to how much any horse should consume in 24 hours. They want what they need to supply the natural waste of the body and keep them in strength and flesh and growing every day. Here is where judgment comes in play. A colt doesn't want drawing so as to make him look gaunt like an old campaigner, neither do you want to stuff him. In aged horses hay at night only, will ordinarily suffice if the horse is a hearty feeder, and again some horses will not eat any more than they need if they have it by them all day. Colts, like boys, ordinarily have good appetites, and want enough to keep them growing.

Give the horse all the water he wants at night, unless he has a race or trial on hand for the morrow, when it would not be advisable. In the morning a horse, if he is in good health and is accustomed to have what water he wants at night after he has finished his hay, will not exhibit much thirst, unless he is a glutton and has gorged himself with his bedding, which habit ought to be curtailed at once, for no horse can be gotten into condition or kept so, if he eats all the litter he can reach. In short, water should not be given a horse in quantity when it is going to interfere with the performance of his daily work. Give him a couple of swallows in the morning before he eats his food. Never give him over one-half a bucket at once except at night, when he may have a reasonable allowance,

TEETH.—The teeth in horses are receiving more attention than formerly, as it is a well settled fact that their teeth are subject to decay, ulceration, irregular growth, etc., same as in the human family, though not perhaps, in the same degree. A horse in his three or four-year-old form is most liable to suffer, as the three-year-old cuts four front teeth and eight back teeth, and in their fourth year they cut four front, eight back, and four tushes, and considerable irritation and fever often attend the cutting of these teeth.

Attention should be directed to the shedding of the molars in the three-year-old, the roots becoming absorbed, the crowns of the teeth get loose and hang to the gums, and should be removed as they will cut the cheek and make the mouth sore. Many horses suffer from toothache with decayed teeth, and when a decayed tooth is discovered it ought to be removed immediately, upon its first attempt to *ache*. The presence of decayed teeth may be detected by such symptoms, as improperly masticated food passing the bowels undigested, tossing the head, discharge from one nostril, irritable disposition, pulling or driving on one rein, and pulling at the bit or refusal to take hold of the bit. The remedy for decayed teeth is removal. You will need the assistance of some one skilled in Veterinary dentistry, to remove a decayed molar tooth. The upper jaw being wider than the under one, the outer margin of the upper grinders become sharp, and unless this over-growth is removed with a tooth-rasp, the cheek, coming in contact with the sharp edges of the grinders, gets sore, and checking a horse aggravates him as it presses the cheek against

the teeth with greater force, The inside margins of the lower grinders get sharp in the same way, and hurt the tongue, and no horse can be made to trot or pace fast, that has teeth that hurt or aggravate him, you should always keep a tooth-rasp handy, they cost little, and you can remove the sharp edges of teeth as well as any one, but for the extraction of a grinder, you had better employ a Veterinary dentist, as it is quite an undertaking. The reason a horse cannot go fast with teeth that hurt him, is that if he carry his head one sided, as he will invariably do if he is driving on one rein, he can't go square, and is bound to tangle in his gait, and of course cannot speed fast.

There are different opinions about blankets and covering for horses in the stable. I don't believe a horse needs anything more than to make him comfortable. No horse ought to sweat under the blankets in the stable, and he should be provided with changes, so he can be made comfortable in any change of temperature. In winter, if he is clipped, he must be provided with extra clothing, and for out door use the blanket for clipped horses should be large enough to cover them well down toward their feet, and the shed ought to be a warm one, or they ought not to be left under it at all if it is a cold day.

WORKING HORSES.—It is important for the amateur to understand why he is working his horse. What is the object of it? Why, to develop his speed, of course. But not one man in ten can give you an intelligent answer to your questions as why do you do so and so. Now no horse can go any faster than he has got power to carry him. If the speed is not in him, no man can make him show it.

Speed is the physical capacity or power to get over the ground at a rapid rate. A horse may have apparently the physical capacity to go fast, but does not and can not; he may be proportioned correctly and fill all the dimensions of the ~~tape-line~~ *trotter* and *look* like a trotter, but can't go on—and here is where those knowing men get left in trying to pick out a trotter with a tape line and references to the stud books. A horse without the inborn disposition to go on and get there is no good, no matter how he is bred, how he is formed, or how he is gaited. You get him in a tight place where it is necessary for him to extend himself and he will shut himself up like a jack knife, and *quit* without any apparent reason, only that he don't seem to want to do it. If a horse is strong and *has* the disposition to go on, if he is not quite perfectly gaited, he will oftener surprise you by his rapid improvement than a finely gaited one, and just as strong and sound, that don't care whether he gets there or not.

We will assume that you have got a horse sound and five years old, that has a gait that is pure enough to carry him a mile in 2:40, when in condition to go a mile; and this horse has never had an attempt made to develop the speed he is supposed to possess. We will also assume that it is spring, the

roads are in condition to drive upon, and *you* are situated so you or perhaps some of the boys can give this horse the attention he needs to develop the latent speed he is expected in the near future to exhibit.

We will suppose this horse as yet has not shown any disposition to interfere or cut himself anywhere; this being the case, you have not got to worry yourself about the shoeing, a very great relief. Now you want to make a firm resolve not to speed this horse, either for your own or any other person's gratification or amusement, until he has had some work and got strong, and has learned something about going along—if you expect to make a trotter out of him. Walking exercise has been found not absolutely necessary, as formerly indulged in. Old time trainers used to begin by giving horses walking exercise in the spring for two or three weeks before they even thought of driving them in harness. You may commence by jogging and walking a little, say five or six miles (in the forenoon is the best time) for the first week or ten days. Ten quarts of oats or three feeds, of four quarts in the morning, two at noon, and four again at night, with some hay, ought to be enough for him, and you ought to see him begin to improve in the way he does his work as well as in appearance. By this time he will be in shape to send along a little, and you ought to increase his work a little, and likewise the amount of oats, say to twelve quarts per day; but if you observe that he don't like the increased amount of work, wait a week more. By this time the muscles must have tone enough in them to carry him along on a good road a ten-mile-an-hour clip, for four or five miles, without much apparent fatigue. But don't begin to brush him yet; he wants to be able to jog his ten miles out in an hour easy before you commence to call on him. If he is the horse you think he is, he will soon commence to do his brushing himself. And here is where you want to use judgment; *right here* is where one-half the good horses are ruined. If he now commences to take hold of the bit and go away at a rapid clip, steady him carefully, and take him back before he commences to tangle or tire. The chances are at this time, if you let him go on and trot over himself and go into a break, he will hit himself somewhere, and it will set him back in his training weeks, and perhaps spoil him. Don't let him go to a break; trotters nowadays don't leave their feet often when they beat 2:20; they don't have time.

SHOEING, BOOTS, CARE AFTER WORK, ETC.—Up to this time, perhaps, you have seen no occasion to change his shoeing, except to have them removed and reset. You now want to observe closely how he carries his legs, and if he is brushing himself anywhere. Young horses often exhibit a propensity to shove the hind foot under the front foot and brush the hoof up at the coronet, which is called "scalping." If your horse does *this*, get a pair of scalping boots the first thing you do, and wear them on him in his work. Horses do this scalping while jogging, but it gets them into the habit of single footing, and when they get this habit it takes a long time to restore

their confidence so they will go square again. All horses, or nearly all that can go fast, go with their hind feet outward of their forward ones. You also want to observe if this horse brushes his hind pasterns with the outside of the shoes of the front feet; this is called speedy cutting. If your horse, in your judgment, can show indications of a three minute clip or better, look out for this speedy cutting business. Now if your horse ever goes to a break when he is moving within his speed, he has hit himself somewhere, and you should get right out and see about it at once. If, upon examination, you find he has hit himself, don't start him up again until he is protected. If he is shod allright don't expect to remedy the difficulty by changing shoes unless the trouble is apparent. Clinches some times work out by the head of the nail striking a stone and driving it up; to avoid this have the shoer file the heads of the nails down even with the shoe, then the clinches will not work out to bother you. And here is something I want you to recollect about shoeing for interfering or knee-knocking. Don't ever take any portion of the wall of the foot away in any case. All you take off the inside of the feet just so much nearer together the horse's feet will be whether in motion or standing, and you spoil the shape of the foot and weaken it. Horses sometimes interfere and hit themselves without any fault of the shoer. Perhaps the animal has not learned to travel, is weak, or a dozen other causes no blacksmith is responsible for.

In bringing your horse in from a drive after he has acquired some strength, let him come home in shape, so you can scrape a little sweat out of him after he has stood with a woolen sheet on him a few minutes, or while you are hanging up his harness. If he breaks out in perspiration strip off the sheet and scrape him out as dry as possible and throw the sheet over his back and loins, and commence and rub out his head and ears and neck, and finally his whole body. Don't put him in his stall until he is cooled off, so he will not break out again. It may take three quarters of an hour, probably; you need not rub all the time. Pin the sheet on him and walk him around in the sun and out of a draft, and before you get done with him wash out his feet clean and brush him all over; brush out his mane and foretop and tail, but don't tear out any hair. If it is time to feed now, give him a suck of water and his dinner, and go and get your own. The best rubbers are old salt sacks cut into four pieces. Always have plenty of clean, dry rubbers on hand; you can't dry out a horse with a dirty, damp rubber.

Don't be afraid to give your horse some grass. Let him pick it himself in the latter part of the afternoon if you work him in the forenoon, and if he at any time is constipated give him a big bran mash at night with some salt in it. Keep his bowels open unless he is of a washy constitution and inclined to scour; you must use judgment. A horse that scours (or in other words exhibits an unnatural looseness of the bowels) is out of shape some where, and it is probably the result of indigestion or derangement of the stomach and

bowels, this may be corrected by giving a tablespoonful of powdered charcoal three times a day in the feed.

The feet and legs must be looked after now; don't soak your horse out too much in hot or or any other water, because you have seen some trainer do it. It might have been necessary in the case of an old ringer that had to be scalded every day to keep him on earth. If you don't detect any fever in the legs, or inclination to swell over night, your horse is all right.

FASTER WORK.—About four weeks must have elapsed by this time, and you can now begin to call on the horse for a brush occasionally in his work. Don't brush him over a quarter yet at a time, and not too often, and never up to the full measure of his speed. Some horses will take more work than others, but an ordinary well-bred horse ought to jog out ten or twelve miles a day to a wagon in about an hour without falling off any in appearance, condition or feelings. After you commence to brush the horse along in his daily work, your judgment ought to guide you as to whether you are overworking him or not.

I suppose you think you ought to give him a big scrape now. Perhaps it is not necessary; a neck sweat and hood may reduce the throat and neck enough, and perhaps he don't want any scrape of the body—more than he gets every day in his work—yet a while. I will, further on in the work, give you a scientific explanation of a scrape, how to do it and what to do it for. It is about time this horse had a half mile trial. If you have any suspicion he will hit his knees, protect him. The night before you give him the trial, give him about half the amount of hay he ordinarily has and about two-thirds the usual quantity of water; in the morning give him two quarts of oats at the usual time of feeding (we assume you have been giving him his breakfast in one feed up to this time) and no hay of any account. Give him a couple of quarts of water when you go to the stable in the morning, and after he has eaten his oats and a very little hay let him have two or three swallows more. Hook him up about ten o'clock, the food having had time to assimilate, and jog him out five miles; then give him a swallow of water, and give him a half mile, commencing to call on him as you approach the half mile pole and send him for all he is worth till you get to the end, without letting him leave his feet. Have some friend you can rely on to hold the watch that can catch the time correctly, and that wont *lie* to you. If your horse has shown a half in 1:25, you have got a quite promising young horse that has only been worked four weeks. This is a 50 clip, and lots of them can't do it that have been worked all summer. Now jog your horse to the stable and do him up in good shape. The first thing you do, put a set of linen bandages wet in warm water on his legs, all round, and let them stay on till they get dry or the horse has cooled out, then take them off, hand rub the legs a little, and if you don't see any swelling or heat in the legs they are all right and he has done well. Work him now just the same as you have all along; in a week

give him a trial a mile out. If he has improved he ought to show you a mile in 2:45. You will, by observing how your horse finishes his first mile, be able to determine to a great extent what kind of a horse you have. If he finishes his first mile as though he had another mile in him, and trots the last half a couple of seconds the fastest, and does not show much distress in breathing, and his legs tremble but slightly if any, you may conclude you have got quite a horse, providing, of course, he has done his mile in as good time as you have reason to expect of him. You ought not to have driven him to a break in either of these trials. He had better have a little speed left in him than to have gone to a break. In ten days, if he is improving, give him another trial, a mile and repeat. Don't try to drive all the speed out of him the first heat, and if he acts as though he had plenty more in him, give him the second mile with an interval of twenty minutes or half an hour between the heats. As soon as you have finished the first heat, unhook him from the sulky, pull off his harness and throw a sheet on him: give him two or three swallows of water, and in three or four minutes, while you are walking him around, he will break out in a profuse perspiration. (Don't get in a draft with him.) Commence and scrape out his neck and shoulders and finally his whole body; have some one to help rub him up, and in course of twenty minutes he will be sufficiently recovered to harness again and prepare for the next heat. If he has worn any boots in the first trial, remove them as soon as he is unharnessed and see that they have not chafed him, and put them back on the last thing before you hitch him in the sulky for the last heat. Jog him a mile at least before speeding him the second mile.

THE SWEAT.—If the horse you are developing is five years old or over and he should be on the beefy side, you may find it advisable to give him a sweat. If this is necessary, proceed as follows: The night before you sweat your horse, give him a bran mash in lieu of his regular feed of grain, and only half the ordinary allowance of water, and half his usual allowance of hay, and if a gross feeder muzzle him. In the morning, give him not over two quarts of oats when you feed your other horses, and no water, and as soon as he has eaten the grain muzzle him, groom him as usual, and about eight o'clock give him a walk for half an hour. By the time he has been walked the bran mash will have performed its office, and he will be emptied out and ready to prepare for the sweat. Take him into the stable, take a long, soft woolen blanket and double it together so it will be full length and half the width, throw it over his back and bring the end under his belly; be careful to have it straight and free from wrinkles—it ought to lap a foot or more—fasten it with safety skewers, or, what is better, four strings sewed onto the side of the blanket a little below where it crosses the back bone, and the same number on the end that you bring between the fore and hind legs; then it can be fastened without any danger of wounding the skin. Take a little lighter blanket and double it in the same way, and fold it as many times

around the neck, enveloping it from the shoulder to the ears; now take another blanket, but smaller, and cover the horse all over with it, tying it under the tail and around the breast. A hood large enough to cover the shoulders, without ear pieces. A suit over this, buckled at the flank; hood with ear pieces, and his costume is complete. Let out your harness to accommodate the extra amount of clothing, and hitch him into the sulky. (Have a drink made for him of oatmeal and water, which make a little above blood heat by adding hot water.) Walk him and jog a couple of miles, when the perspiration will begin to start some, and you can give him a drink of the warm gruel, a few swallows (two or three), which will facilitate the flow. Then give him a couple of miles more jogging, fast enough to start the moisture, and go to the stable, unhitch him, but throw immediately on him a couple of extra blankets to retain all the heat. He will labor in breathing, but give him another swallow of the warm drink, when the perspiration will begin to run down his legs and ooze through the blankets. Don't be alarmed at the profuse flow; you will see that he doesn't breathe as hard as before, and the arteries will become more elastic and the pulsations less rapid. Have your scrapers and rubbers ready, unbuckle the hood and outside blanket, throw the hood across his loin and turn back the clothes so as to expose his chest, throw the neck wrapper to one side and scrape him out carefully. Have help enough to rub him gently around the head and ears, while you, after covering the neck and chest, scrape his back, sides and quarters; be careful not to irritate him. His neck will now scrape again; go all over him again, and then throw off all the wet clothes; rub him briskly, but gently, all over with dry, clean rubbers, and get some dry, clean clothes—blanket and hood—and smooth his hair down the right way, put on the blanket and hood and put a light blanket over this, outside the tail, and have him walked for fifteen minutes, when you can finish doing him up by drying him up slowly, occasionally removing the clothes and substituting lighter ones. Wash his feet, and wash his legs from the knees and hocks down with warm water. When this is done, dip the bandages in hot water and do up his legs from the knee and hock to the coronet. Fix up his bedding, give him two quarts of drink previously prepared by putting a tablespoonful of pure cream tartar into ten quarts of water, which is all he ought to have until the next morning. Pour out about two quarts of the ascedulated drink at a time, so not to tantalize him by showing him more water than you want him to drink at one time. Give him two quarts of oats and three or four pounds of hay, and when he has eaten it, muzzle him, and leave him undisturbed till the next feed. The object of restricting him in the amount of water, is that the absorbents will take hold of the fat, which they would not do if you gave him an unlimited supply of fluids. A good clear warm day should always be taken advantage of to give a horse a sweat, and you should be careful not to get into a draft of air in the cooling out process. His next feed will be his regular evening

meal of oats and hay, which ought to be curtailed about one-third in amount, but the morning following feed him as usual, and give water likewise.

TREATMENT AFTER THE SWEAT.—Hitch up your horse the morning after his sweat and jog him three or four miles slowly, but don't give him any fast work until the day after. If you have not overdone the sweating, your horse will act and step out as light as a feather, and his eye will be clear and bright. You can't fail to see if your horse *don't* feel as well as common. You will, the second day after the sweat, give him some fast work, but not up to his limit of speed, as this should never be done except in a trial. I will say a little more about walking. In the early part of the horse's training, walking exercise in the morning should be given when the dew is on the grass, and walk him so he can have the benefit of it on his legs and feet. A walk towards evening of an hour, with the privilege of picking grass, will be enjoyed by the animal and his appetite and constitution benefited. In training horses a man must get up in the morning. A horse in training ought to be fed at five o'clock in the morning, after having a few swallows of water, two quarts of oats, his bed shaken up and stall cleaned of manure and wet straw. After you have had your breakfast, clean his coat and feet and give him a little walk in the dew, hitch him into the sulky and give him his work, after which he can be fed two quarts more oats and some hay, and watered. Now fix up his bed and leave him to himself till three o'clock in the afternoon, when you can feed him two quarts more oats, and when they are eaten give him some more water, after which you can give him his afternoon or evening walk, then is your opportunity to let him eat some grass, and after he has been returned to his stable, hand rub his legs a little, see if he has cuffed himself anywhere, pick and wash out his feet, have his bed fixed up a little and return him to his stall till seven o'clock, when you can give him his feed of four quarts of oats and his full allowance of water, and what hay he needs.

TOE WEIGHTS CHANGING THE WAY OF GOING.—Toe weights have played an important part in developing the speed and steadiness in way of going in trotters, and are of recent discovery, comparatively. But many good horses have been injured by wearing more weight than was absolutely necessary, which has had the effect of straining the muscles and tendons, and by injuring the feet, by bringing them in contact with the ground with greater force than the feet were calculated to stand without serious results. After a horse has been converted, I think the weights shuld be decreased in ounces gradually, to the lowest point possible, and more reliance placed upon skillful driving, to keep the horse level in his gait. Many horses that are pure gaited trotters can trot faster, and without detriment to themselves, by wearing a reasonable amount of weight on each fore foot, as the weight at the apex of the toe has the effect to straighten out the fore leg when extended, and thus gain in length of stride, whereby they can trot the mile out from 2 to 5 seconds faster than they could without them. There are a dozen different styles of

toe weights that have, as claimed by their respective inventors, their advantages, and of their usefulness in many cases there is no question. In the development of speed in horses that are mixed gaited, by this is meant horses that cannot either pace or trot squarely, weights will always have to be resorted to, if you desire to square them and save time in doing so. The application of a four or six ounce weight to each hind foot, on the outside, has the effect of opening their gait behind and thereby improving their way of going.

A trotter that puts one hind foot past his front foot on the outside, but carries the other hind foot in line with the front one on the same side is something very annoying to a trainer. The foot that does not go out where it ought to is ordinarily shod with a shoe twice as heavy on the outside as on the inside, and sometimes a side weight is used, and there are cases where the reverse has been resorted to with success. This is accounted for by some men as sympathetic. The mare Adelaide by Phil Sheridan, placed one hind foot between her front ones instead of going on the outside with *both* hind feet. She could go very fast and got a record of 2:19¾ this way of going, but these examples are rare. Many experiments will have to be resorted to in order to gait some horses properly, while others are the poetry of motion. If you have a horse that uses one hind leg properly and swings the other in line with his front foot, if a side weight or a shoe with the weight in the outside half doesn't have the desired effect, reverse the matter and shoe that foot light, with an ordinary shoe, and shoe the foot that is carried properly, same as you have previously shod the other, and use a side weight also. This has had the effect in some cases, of inducing the horse to carry both legs properly. Many experiments have to be resorted to, in order to get some horses to go square.

HARNESSING AND DRIVING HORSES.—In "hitching a horse," as it is termed among horsemen, many men are deficient, otherwise good horsemen. A horse with a harness on that does not fit him, is in about the same frame of mind as his driver would be with a shirt on that is an uncomfortable fit. See that your head-stall fits his head, and that the hair in his mane and foretop is not doubled up under the crown piece of the head-stall, the saddle should be set at the right point, back of withers, and the back strap should be the right length to keep the check-rein from pulling the saddle forward onto the withers. The girths should be buckled snugly and the breeching should be loose enough to give the quarters plenty of room, and tight enough not to allow the wagon to run on to the horse, should you be obliged to take a pull on him. Make a point to see that everything about the harness and vehicle is strong, and properly hitched; attention to this particular often saves many an accident, and in some cases, loss of life and property. Martingales should be long enough, ordinarily, to allow the reins to draw straight from the bit to turrets, and in many cases can be dispensed with entirely.

In driving, the whip is an important auxiliary, and you should never get in behind a horse without one, but an indiscriminate use of the whip will produce unsatisfactory results with horses, as well as with the growing generation of men. Never use it unless it is necessary, then let the horse know that it is no plaything. In driving horses, insist upon an even rate of speed when you start them up, and don't pull at the bit, only steady the horse, he will as he improves in strength and gait, take hold of the bit hard enough to suit you. Horses learn to go themselves if they are not interfered with and have the *capacity* to go. A horse in a horseman's hands may in a short time learn to go a clip that will carry a man ten or twelve miles an hour, without any persuasion, and do it cheerfully, and passing into another man's hands, get in a short time so that he will have to be clubbed to get him ten miles in an hour, or else he will graduate into a chronic puller; now this is all in the management and driving. For horses that shy, and are afraid of objects they are unacquainted with, of course you must be on the look out for. But the fear in the horse is oftener intensified by the timid driver, than a catastrophe is averted by such a driver's exertions. Watch your horse but don't communicate to him through the medium of the reins and bit, that you anticipate any unruly exhibition from him. There is a magnetism existing which cannot be accounted for, that is communicated from the driver to the horse and from the horse to the man through the medium of the reins and bit. Any man having had much experience in riding and driving horses, can attest to this statement. You may go out to drive, not feeling first rate, on a fine morning; if the horse possesses a superabundance of animal spirits, you will shortly begin to feel better and exhilarated by the association. Some may say it is only the air and exercise, and constant and rapid change of scenery, but that is not all, you get into a street car, and ride eight or ten miles at the same rate as behind the horse and you will be able to appreciate the difference.

In recovering a horse from a break, some horses acquire the habit of catching their gait by a pull upon the left rein, some will only catch with the right, which habit is formed by the driver to whom they owe their education. A horse should not be snatched from side to side but steady him until he knows what he is about, and ordinarily by a slight shake of the bit he will recover his trot readily. Never allow a horse to slacken his rate of speed if it is possible to catch him without doing so. There is occasionally a horse that will leave his feet and make a couple of jumps, when a steady pull will seemingly catch him in the air and he will land in a fair trot and apparently glorying in his accomplishment. Horses that leave their feet without cause, like interfering, brushing themselves, etc., and are moving entirely within their limit of speed, a little whalebone does a world of good, and you can make them understand by its use, that you will put up with no such foolishness. But before you use the whip be sure that the horse is not brushing

himself anywhere, in which case you would commit an unpardonable mistake by whipping him, and a horse may be guilty of the offence of leaving his feet in a playful manner without being able seemingly to control his animal spirits. Work is the remedy to be applied in this case instead of the whip.

When a horse has come to his speed, do not dog the speed out of him by long tedious slow jogging, for when his limbs are seasoned to go a mile in good time, say 2:40, or better, his further improvement in speed will result from short jogs and sharp brushes of speed in his work, not *too* extended, together with close attention to the conditioning process, with a repeat once a week, or ten days, if you are trotting him in races, and if you are, he will not need a repeat. Don't overwork him; two-thirds of the "quitters" are horses that have too much work; and bear in mind another important truth, different horses will require different treatment in respect both to feeding, water and work, and if you had a dozen horses, probably not more than two of them would require the same treatment, and your *judgment* must guide you as to feed, water, work, shoeing and hitching.

A careful study of the foregoing by any intelligent young fellow ought to enable him to take hold of any colt or horse on the farm that gives evidence of possessing speed, and a few weeks' labor, if the animal possesses speed, will bring in a profitable return in the shape of the much greater price you can command for him in the market. Many a horse has been bought from a farmer for a couple of hundred dollars, that after one month's careful training, has increased over one hundred per cent. That extra two hundred dollars might just as well have gone into the farmer's hands.

The endeavor in the foregoing pages has been to give the information the amateur horseman would naturally crave upon the subject of developing speed, at the outset of his career as a trainer. Perhaps there will never be a man read this book but what knows, or *thinks* he knows it nearly all, but that is nothing. There is no subject that the average man, and woman even, think they are as competent to grapple with as The Horse, and if you desire to arouse a man's antagonism, tell him *he* doesn't know *anything* about a horse.

There is a great amount of pleasure and satisfaction in the companionship of horses if they are good ones, but if you possess the knowledge and discernment that will enable you, not only to select a good one from among ten thousand, but to develop him in speed and money value also, you combine pleasure with profit. Many a horse to-day is performing menial service that had he in his youth been taken in hand by a thorough horseman, would have had his name enrolled in the 2:30 list. *No horse* can ever distinguish himself without an opportunity, and the assistance of a competent man to develop his speed is the one thing needed.

THOUGHTS ON SHOEING BY A PRACTICAL MAN.

"NO FOOT, NO HORSE."

In removing the old shoe from the foot great care should be exercised by the blacksmith to raise all the clinches, inasmuch as carelessness in passing over even one clinch is liable to lead to serious consequences. Anything approaching to violent wrenching should be scrupulously avoided; for instance, if a nail is dragged through the crust of the horse's hoof with the clinch not removed, it not only inflicts pain, but at the same time so separates and tears away the fibres of the horn that it interferes with the future nail-hold. In this connection every blacksmith should have handy a punch, so that even after removing the clinch, if the nail does not draw easily, instead of tugging away at it as is too often the case use the punch and give it a start, a little common sense attention of this kind has a very benificial effect.

When the shoe is removed the edges of the foot should be well rasped, and this when carefully done will detect the presence of any nail slivers that may have been left near the edge of the nail holes.

The operation of paring out the front is work that demands from the operator both common sense and good judgment. A good many men do not use the knife sufficient in cutting away some of the parts that are very hard and unyielding, but are very prone when they tackle the frog which presents an even smooth surface that yields readily to the knife, to go ahead and remove more of it a great deal than sound judgment would permit of.

It is impossible to lay down any cast iron rule by which horses feet should be pared, there are so many things to take into consideration that it is absolutely necessary for a blacksmith who desires to enjoy the reputation of being a good workman, to always have his considering cap on and keep on thinking. For instance, take a hot dry season when there is no moisture in the ground, when the roads are dusty and abounding with loose stones, it stands to reason that the sole of the horse's foot should not be pared as close as in a moist season of the year when the ground is soft and yielding, because in the dry season there is constant danger of the sole being bruised by the loose rolling stones, and it therefore requires more horn covering to carry it in safety.

If you take a horse with upright feet and high heels, the horn grows rapidly, especially towards the front of the foot, it, therefore, becomes advisable to shorten the toe and lower the heel, and keep the sole well pared out, but, on the other hand, in the case of flat-footed and low-heeled horses, with

whom the horn grows slowly and sparingly to use the rasp very lightly, and exercise great caution with the knife.

The explanation for doing as above is simple. In the first place, the solidity of the sole interferes with the due descent of the coffin bone, when the weight of the horn bears upon the foot, and this necessitates it being paired thinner, and rendered more yielding, while in the latter case, it being thin, it offers only a slight resistance to the downward tendency of the coffin bone.

The horse's foot is like the human foot in being all sizes and shapes, and it would be just as sensible to order one particular shaped boot for all kinds of men's feet as it would be to recommend one particular mode of pairing out a horse's foot or one particular shape of shoe. A well-formed foot, having a reasonable growth of horn, should have the toe shortened, the heels lowered, and the dead horn well pared out, and if it looks to require it; remove some of the living until it yields to a steady pressure from the thumb.

Care should be exercised in paring the corners on the inside, formed by the junction of the crust and bars; this is the common seat of corn, and undue accumulation of horn hereabouts is liable to bruise the tender sole.

Some blacksmiths are fond of what they call "opening out the heels," they cut away the sides of the bars, making an apparent increase of width between the heels, but it is entirely deceitful and only tends to lessen the power of resistance in the bars, and tends to cause ultimate contraction of the feet. The following by W. Miles, Esq., a very high authority on the horse's foot, is worthy of very careful thought, the author having devoted years of study and experiment to test the soundness of his views:

"If it were not for the unaccountable prejudice in favor of carving the frog into shape at every shoeing, I should have had very little to say about it in this place; my only direction, as a general rule, would have been, *to leave it alone, and never allow a knife to approach it*; but this far spread prejudice renders it necessary for me to explain why the knife must be so entirely withheld from the frog, while its liberal application to the other parts of the foot is shown to be so beneficial to them. First, then, the frog has naturally less power of producing horn than any other part of the foot; and the effect of shoeing seems to be, still further to diminish this power by obstructing the expansion of the hoof, and thereby exposing the membrane which secretes the horn to undue pressure: indeed in the generality of feet it would appear almost to check the growth of the frog altogether; for if we compare the size of the frog with the circumference of the foot in a horse long accustomed to be shod, we shall find the space occupied by it will not exceed one-tenth or one-twelfth of the whole circumference; whereas in the natural and unshod foot it occupies about one-sixth. Now this dwindling down to one-half its proper size is the direct effect of shoeing and paring;

but I believe that much the larger portion of the mischief is attributable to the unnecessary evil of paring, rather than the necessary one of shoeing. The reason assigned for further mutilating this fast diminishing organ at every shoeing, is a most unfounded dread that it would run all over the foot, if it were not for the controlling influence of the drawing-knife: and so general is this belief that it is entertained more or less by almost every smith, notwithstanding the daily, nay hourly, evidence that is presented to his senses of the gradual but certain diminution of the frogs of nearly all the horses which he shoes. I have horses in my possession whose frogs have not been touched by a knife for five years, and yet it has never occurred to anyone that they are overgrown; but everyone is attracted by the eveness of surface and fine expanded cleft which they present. Perhaps about one in a thousand may form an exception; where a large loose-textured frog may require a little paring once or twice in a year. The layer of horn that covers the frog is thinner in substance and more delicate in texture than that of any other part of the foot, and, when once destroyed is very imperfectly and sparingly reproduced. The first stroke of the knife removes this thin horny covering altogether, and lays bare an under surface, totally unfitted, from its moist, soft texture, for exposure either to the hard ground or the action of the air; and in consequence of such unnatural exposure it soon becomes dry and shrinks: then follow cracks,—the edges of which turning outwards form rags; these rags are removed by the smith at the next shoeing, whereby another such surface is exposed, and another foundation laid for other rags; and so on until at last the protuding, plump, elastic cushion, interposed by nature between the navicular joint and the ground, and so essential to its preservation from injury, is converted by the mischievous interference of art into the dry, shrunk, unyielding apology for a frog, to be seen in the foot of almost every horse that has been regularly shod for a few years. The frog is provided within itself with two very efficient modes of throwing off any superfluous horn it may be troubled with; and it is very unwise in man to interfere with them: the first and most common is the separation from its surface of small bran-like scales, which becoming dry fall off in a kind of whitish scurf, not unlike the dust that adheres to Turkey figs. The other, which is upon a larger scale, and of rarer occurrence, is sometimes called "casting the frog." A thick layer of frog separatos itself in a body, and shells off—to the full as deep as a usual paring with the knife; but it is worthy of remark that there is important difference between the two operations: nature never removes the horny covering until she has provided another horny covering beneath, so that although a large portion of the frog may have been removed, there still remains a perfect frog behind, smaller it is true, but covered with horn, and in every way fitted to sustain exposure; while the knife, on the contrary, removes the horny covering, but is unable to substitute any other in its stead. My advice therefore is to leave the frog to itself—nature will remove the

superflous horn, and the rags can do no harm, and, if unmolested, will soon disappear altogether."

The weight of the shoe is a matter of importance. Many people, especially of course in driving horses, pay as much attention to the shape as they do to the convenience and comfort of the shoe. This is a great mistake. The horse is the first consideration. If he is provided with shoes easy to work in, the longer will necessarily be his career of usefulness. Avoid too light shoes, their great objection being a liability to bend and the insufficient covering afforded.

It is a common error to suppose that the foot receives its form from the shoe. The truth really is, that the shape of the shoe cannot possibly influence the shape of the foot. Only the weight of the horse can do this. It is the situation of the nails and not the shape of the shoe, that determines the form of the foot. Whether the shoe be wide or narrow, if the heels and quartors of both sides be nailed to it, the foot will inevitably become more and more contracted. If the nails on the contrary be placed in the outside quarter and toe, leaving the heels and quarters of the inside, which are the most expansive portions, free, no shape that we can give to the shoe can of itself change the form of the foot.

The shoe should possess substance enough to prevent its bending and width of web enough to ensure protection to the foot; the thickness should continue precisely the same from toe to heel, the toe being turned up out of the line of wear. Supposing a horse to wear his shoes so hard that they will not last a month—much beyond which, as the foot will outgrow them, they had better not last—then steel the toe, but still let it be turned up out of the line of wear. A small clip at the point of the toe will prevent displacement of the shoe backward.

Always have a good flat even space left around the foot surface of the shoe for the crust to bear upon. Remember that the crust sustains the whole weight of the shoe. In this space the nail-holes should be punched and not partly in it and partly in the seating.

The shoe should not be applied to the foot so hot that it would burn itself into its place upon the foot without the assistance of rasp or drawing knife, but it should be tried to the foot sufficiensly hot to scorch every part that bears unevenly upon it. This is the only way in which the even bearing necessary to a perfect fitting of the shoe can be insured.

Before nailing to the foot always ascertain that the shoe can be kept in its place by pressure of the hands so as to preclude any appearance of daylight between it and the foot. If the shoe does not exactly correspond to the surface of the foot, it is liable to shift, thereby exposing the nails to a constant strain, when instead of keeping it in place by their own strength they should simply have to hold it to the foot.

Consistently with keeping the shoes firmly in place use just as

few nails as possible. There is a great diversity of opinion among good judges as to the number of nails necessary, but from practical experience we are disposed to adopt the views expressed by the same authority as quoted before in the following:

"When my attention was first directed to the subject of nailing, I was employing seven nails in each fore, and eight in each hind shoe. I then withdrew one nail from each shoe, thus reducing the number to six in the fore, and seven in the hind shoes; and finding at the end of a year that the shoes of all the horses had been as firmly rotained as formerly, I withdrew another nail from each shoe, leaving five in the fore shoes and six in the hind. I found, however, that six nails would not retain the hind shoe of a carriage horse, without allowing it to shift; so I returned to seven in the hind shoes and have continued to employ that number ever since; bnt five have retained all the fore shoes as firmly during the whole of the last year and a half, as six had previously done. I have always been very careful to mark that the nails were not driven high up in the crust, but brought out as soon as possible; and that they were very lightly driven up before the clinches were turned down, and not, as is generally the case, forced up with all the power that the smith can bring to bear upon them with his hammer."

Do not rasp the clinches too fine, but turn them down, broad and firm. Above all things avoid the practise of rasping the whole surface of the hoof after the clinches have been turned down. If the clinches should happen to rise, they must be replaced without delay, as such rising imparts to the nails a freedom of motion which is sure to enlarge the size of the holes, and this mischief is often increased by the violent wrenching which the shoe undergoes in the process of removal by the smith.

Under such circumstances the idiotic plan is usually adopted of increasing the number of nails, thereby increasing the evil which it is sought to remedy. As a matter of fact, strange as it may seem, these shaky places, as they are called, may be relieved by the omission of one or two of the nails, without endangering the security of the shoe. Six nails should at all times be sufficient to retain the shoe firmly, and seven should be the extreme limit.

Cavalry horsec are frequently called upon to do the roughest kind of travelling, and the veterinary surgeon of one of Her Majesty's regiments of dragoons once told the writor that for two years he had not employed more than six nails, and these all placed in the outside limb and toe of the shoe, all the remainder of the shoe remaining free and unattached to the foot. With this regiment the loss of a shoe was a great rarity, even on a field day, the work of which is considered to be most trying on the security of horse's shoes. This system of shoeing leaves the foot, with respect to its power of expansion, as nearly as possible in a state of nature, and prevents the growth of corns and other excrescences.

A pedlar, whose avocation frequently required him to drive thirty miles a day, states that he found his horse stepping short and tenderly. He consulted an experienced vet., who advised him to shoe the horse with five nails only, upon the one-sided plan of nailing. He followed the advice, and he found the horse wonderfully benefitted thereby, stepping out firmly and confidently. In the first pair of shoes he drove the horse 180 miles in six days, and at the end of the journey they were as firmly attached to the feet as when he started out, and they continued so for five weeks, when the horse was reshod. He had also found five nails retain a shoe, with leather between it and the foot, for an equally long period.

In this connection possibly another reference may be made to our practical friend, Mr. Wm. Miles, who tried this method of shoeing with leather, and thus records his experienc :

"The horse in question was as unfavorable a subject for the experiment as could have been selected, being twenty years old, with large, flat brittle feet, and high action. He is, moreover, of a nervous temperament, and occasionally knocks his feet about very much ; I have, nevertheless, continued to shoe him in leather during nine months, and the result has shown the plan to have been eminently successful : the character of the horn has changed from brittle and shaky to firm and tough, and affords secure nail-hold in every part. His shoes, which were removed three weeks ago, are now entirely worn out. I found them securely held to the feet, and the clinches unmoved : —not one of the five nails, which constituted the only fastening of either of the fore shoes, had penetrated quite an inch up the crust, before it was brought out and clinched down ; and the last on the inside, which was five inches and three-quarters from the heel, barely extended three-quarters of an inch up the crust. Lighter fastening than this cannot be conceived, and, I take it, could only succeed, where the horn has become solid, and the shoe has been fitted with great care. The smallest uneven bearing of the crust upon the shoe, or the least projection of the shoe beyond the hoof, at the quarters or sides of the heels, would to a certainty endanger its security."

Being less liable to injury, the hind foot scarcely demands the same attention as the fore foot. Still it is not free from ailments, and sometimes is subject to disease of the navicular joint. We should endeavor to guard against these things by interfering as little as possible with its expansive power, which will best be done by keeping the nails on the inside as far removed from the heel as possible, to which end the employment of seven nails only is recommended, four being placed in the outer and three in the inner side of the shoe. In the inner side the holes should be punched closer together, and kept more towards the toe than those on the outside, which need to be more spread out, as affording greater security of hold to the foot. Care should be taken to fit the shoe to the hoof all round, particularly at the heels, which are too commonly left without any support whatever ; and the mis-

chievous custom of turning down the outer heel only, must be avoided. Calkins had better be dispensed with, excepting for heavy draft, where their ends by entering the ground may prevent the foot from slipping backwards, thus enabling the toe to obtain a firmer hold.

While clips should not be used in place of nails, the toe being the part of the hind shoe exposed to the greatest wear, should always be accompanied by a strong narrow clip turned up in front of the hoof, to prevent the shoe being forced back upon the foot.

To avoid the injury called an "overreach," the back edge of the web all round the toe should be filed away, until it presents a blunt rounded surface. This, if it fails to prevent the overreach altogether, will at least preserve the parts from being wounded.

In cases of "cutting" a good plan is to apply a boot covered with wet pipe clay to the injured leg and then to trot the horse a short distance. The result will be to transfer a portion of the pipe clay to the offending part of the opposite shoe, thereby indicating the necessity of its removal.

As regards cutting with the fore foot, it can almost always be prevented by one-sided nailing and keeping the shoe *a little* within the edge of the crust on the inner side.

Never attempt to fit the foot to the shoe but always the shoe to the foot. For that reason never shoe a horse in the stable but take him, even if it costs a little more, to the blacksmith's forge, for without its aid a satisfactory fit is impossible. Remember you can take no liberty with your horse's feet, and the truly economical man never attempts it.

A few words more on this important subject and the scope of this article will be complete. Give the horse as roomy a stall as possible, and if at all possible give him a loose box. Nothing short of a miracle can save a horse which is habitually confined to one spot from destructive changes in the delicate and complicated mechanism of the foot. Frequent and regular motion is absolutely essential to a sound and healthy condition of the horse's foot. Give your horse regular walking exercise, on no account except in cases of extreme sickness, allow him to put a whole day in the stable undisturbed. Application morning and evening of an ointment composed of a pound and a half of lard and a quarter of a pound of tar, a quarter of a pound of honey and a quarter of a pound of beeswax, the lard and the beeswax being melted together and the tar and honey stirred in, with a little olive oil, will keep the hoof in a healthy elastic state.

Whenever there is heat in the foot the use of cold water bandages will be found useful, care being taken, however, to avoid sudden chills.

A beneficial custom is to stop the feet at night with fresh cow dung.

If your horse is thoroughly tired and exhausted he will be benefitted by standing an hour or two out of the twenty-four in wet sawdust. One-sided nailing and standing in sawdust will generally cure thrushes. Let the horse

be placed in a roomy stall the floor of which has been liberally covered with wet sawdust, his shoes should be taken off, at night remove him to a well littered, dry place. If, however, your horse has weak flat feet it would be better not to let him stand entirely unshod, but shoe him with leather.

Careful attention in seeing that a horse is properly shod, a loose box allowing ample room to move about in, plenty of exercise and judicious feeding of the proper kind of food will be found more effectual than any amount of so-called turning out. In fact, many a horse troubled with slight lameness that with proper care in a loose box stall would have been thoroughly cured in short order, has through being turned out to pasture become worse crippled. Attention to this fact will often save a good deal of wasted time and consequent annoyance.

Famous Horses.

MAUD S., 2.08 3-4.

Maud S. Queen of the trotting turf, foaled 1874, was sold as a two year-old to Mr. Burgher, of Cincinnati, Ohio, for about $300. She was sired by Harold, by Rysdyk's Hambletonian, dam Miss Russell, by Pilot Jr, grand dam Sally Russell, by Boston. Not long after this sale Mr. Burgher died, and in closing up his estate the chestnut filly by Harold was sold to Captain George N. Stone for $650. Her education began as a trotter in her three-year-old form, she having been placed in the hands of W. W. Bair, then a trainer of little repute in Cincinnati. She remained in his hands up to September, 1885, and what she has been and what she is he has made her. Bair found her a very unruly pupil, but kind treatment and careful handling soon subdued her wilful nature, and he had the pleasure of driving her a half in 1.13 that fall. She trotted the same track (a half mile one), as a four-year-old, in 2.22¾, and a few days later turned the Lexington, Ky., track in 2.17½. On the strength of this trial Maud S. was sold to Mr. W. H. Vanderbilt, of New York, for $21,000. He placed the peerless mare in the hands of Carl Burr, Comac, L. I., but his management of her was attended with such disastrous results that in the fall of 1879 she was returned to Bair at Cincinnati.

Maud S.'s career as a trotter dates from the season of 1880. After winning a race at Chester park she was pitted against Major McDowell's bay mare Trinket, who had obtained a mark of 2.19¼ as a four-year-old in 1879. The race was trotted in Chicago; the result is well known. Maud S. won as she pleased trotting the last heat in 2.13¼, which still remains the fastest record in a contested race.

She swept through the Grand Circuit like a brilliant meteor distancing her opponents in hollow style and lowering her already phenomenal record at almost every time of asking. She trotted alternate heats with St. Julien at Rochester in August to beat 2.12¾ and both put in a heat in 2.11½. St. Julien lowered this mark to 2.11¼ a couple of

weeks later at Hartford. His supremacy, however, was short lived. On the 18th of September Maud S. trotted Chicago track in 2:10¾, which mark was reduced to 2:10½ and 2:10¼ in 1881.

The Queen of the Trotting Turf was reserved for road driving by her owner for the next two years; but in 1884, when the little black whirlwind, Jay-eye-See, who had trotted the previous year in 2:10¾, appeared liable to eclipse her record, she was put in training. She was fit for the supreme effort not a day too soon. Jay-eye-see trotted Providence track August 1st in 2:10, and the following day, at Cleveland, the Queen again asserted her supremacy by trotting Glenville in 2:09¾.

Shortly after this Maud S., Queen of the Trotting Turf, was sold to Mr. Robert Bonner, New York, for $40,000, and since that time she has reduced her record twice—to 2:09¼, on the 11th of November, 1884, at Lexington, Ky., and to 2:08¼, on the 30th of July, 1885, at Cleveland. She has also the fastest record (2:13½) ever made in a race, and Mr. Vanderbilt drove her and Aldine, to a top wagon, a mile in public, at Fleetwood Park, in 2:15½. This is the fastest time ever made by any team of trotters, being one quarter of a second faster than the best record of any team to a skeleton wagon with a professional driver.

JAY-EYE-SEE, 2.10.

Jay-Eye-See, the King of the Trotting Turf, is a black gelding about 15 hands high. He was foaled in 1878, and sired by Dictator, by Rysdyk's Hambletonian dam Midnight, by Pilot Jr. Mr. J. I. Case, Racine, Wis., his present owner, purchased him as a yearling from Colonel West for $500. His real education as a trotter began as a four-year-old, and his first contest was one of the most severe races ever participated in by one of that age. It was in the four-year-old stake at Chicago in 1882. Seven heats were trotted and the race finally won by Waiting, who won the first, second, and seventh heats. Jay-Eye-See won the fifth and sixth in 2.22¾, 2.23½. Over the same track, in the same class, at the fall meeting he won handily, losing the second heat to Bronze, in 2.22½, 2.19, 2.19, which was the fastest time for a four-year-old up to that time.

The season of 1883 was one unbroken chain of victories. He opened at Louisville, Ky., where he defeated Charley Ford (2.16¾). He won the five-year-old races at New York, Washington, Chicago, and Pittsburg, where he lowered his record to 2.17¼, in straight heats. He defeated the famous gelding Majolica (2.15) in straight heats for a special purse at Cleveland, lowering his record in the last heat to 2.15½. Director and Clemmie G. lowered their colors to the little black wonder at Buffalo, where he won the $5,000 purse for six-year-olds and under. Rochester hung out $2,000 for him to beat his record, 2.15½, and at the second attempt he flew under the wire in 2.14. This mark was lowered a few weeks later at Providence to 2:11¾

His 1884 campaign was solely against the watch. At Chicago he trotted a heat in 2:11¼. On August 1st, at Providence, against 2:10¾, he trotted the second heat in 2:10, the fastest heat ever trotted by any horse to that date, and Jay-Eye-See was pronounced the fastest trotter in the world, only to be dethroned next day by Maud S., who cut it down to 2:09¾. He trotted a mile later on at Buffalo in 2:10¾, and one week later finished a mile in 2:10. The little black wonder was kept in retirement during 1885, but in 1886 will be sent to cut down his already wonderful record and endeavor to equal the 2:08¾ of Maud S.

PHALLAS, 2:13 3-4.

Phallas, the world's champion trotting stallion, is a handsome bay, standing 15.3 hands full, with a symetrical and powerful comfirmation. He was sired by Dictator, by Rysdyk's Hambletonian dam Betsey Trotwood, by Clark Chief, second dam by Ericsson, son of Mambrino Chief, third dam by Sir William, son of Sir Archy. Phallas was bred by H. C. McDowell, Woodlake, Ky., and sold by him to his present owner, J. I. Case, Racine, Wis. He made his first public appearance at Chicago, in 1882, as a five-year-old, where he trotted an exhibition mile in 2:22¾. His first actual appearance on the turf dates from 1883. Starting in the 2:34 class at Cleveland, he lost the first two heats to Index in slow time (2:32½, 2:29¼) for such a horse, when he was given his head, and won the next three heats in 2.29¼, 2:22¼, and 2:18¼, the last being won in a jog. His next appearance was in the three-minute race at Fleetwood, when he was defeated by Majolica; but, although beaten, he drove the speedy son of Startle out in the third heat in 2:17, which stands to-day the fastest time ever made in a three-minute race. He was also forced to succumb to Majolica at Albany and Washington.

The Chicago summer meeting, however, saw the bay stallion and Bithers, his driver, to the front. Starting in the 2:40 class, he defeated Index and Adelaide, his fastest heat being trotted in 2:21¼. The three-minute race, however, for $3,000, was the card of the meeting. In it he was to meet the unconquered Majolica once more. The son of Startle won the first heat handily in 2:17, and went alone in the second, owing to a false start. The next three heats and race were won by Phallas in 2:16½, 2:20, 2:21¼.

Duquesne and Phallas did battle royal at Cleveland one week later. Duquesne won the first heat in 2:19½. In the second heat, however, Bithers ignored his Pittsburg rival, and sent the son of Dictator for the record of Smuggler (2:15¼), which had stood unapproached since 1876. He failed in the attempt, but finished the mile in 2:15½. The next two heats were won in 2:21¼, 2:17½. This victory was followed by another at Buffalo.

Phallas appeared for the last time in 1883 at the Chicago fall meeting when he defeated Monroe Chief and Maxey Cobb. Monroe Chief won the first and second heats in 2.20, but the next three were secured by Phallas in 2.18, 2.19, 2.23.

The season of 1883 was a marvellous history when it is remembered that he started as a six-year-old without a record, he ended the year with 2.15½ recorded against him. The 1884 campaign was opened in the free-for-all at Chicago. Catchfly won the first heat in 2.19½, then Phallas went on and won the race. The last heat was a marvel. At the word he went away like a bullet and was at the quarter in 33 seconds. The watches indicated 1.07½ when he passed the half-mile pole. He passed the three-quarter pole in 1.40½, and came home amid a volley of cheers in 2.13¾, thus lowering the stallion record of Smuggler, 2.15¼, which had stood unequalled for eight years.

His wonderful performance at Chicago was duplicated at Providence in August where he trotted two heats in an exhibition race in 2.15 and 2.13¾, but was never beaten although he made several attempts on the fast tracks at Buffalo, Philadelphia and New York.

In the fall of 1884 the bay horse Maxey Cobb, by Happy Medium, succeeded in a match against time to lower the wonderful record made by Phallas at Chicago to 2.13¼, and by so doing was declared the fastest trotting stallion living. Talk ran high among horsemen during the first months of 1885, and the result was a match for $5,000 a side and $5,000 added by the Cleveland association. The race was trotted over Glenville track on the 4th of July and was won by Phallas in straight heats in 2.14, 2.15¾, 2.20¼. He also defeated Majolica in straight heats in a matched race for $2500 aside on Fleetwood

Park, Morrisania, N. Y., in 2.16, 2.18¾, 2.26¾. This was Phallas' last great performance. He was defeated by the game little gelding Harry Wilkes (2.15) at Philadelphia, Pa., after winning the third heat. Shortly after this he went lame and was retired to Hickory Grove, his owner's stock farm, where he occupys the premier position.

PATRON, 2.19 1-2.

Patron, the champion three-year-old stallion, is a bright bay in color, standing 15·1 hands, and was bred at Glenview, Louisville, Ky., by the late J. C. McFerran from whom Messrs. Merrill & Scott, of Tilsonburg, Ont., purchased him as a yearling. He is the great exponent of the theorists of trotting blood and a lasting example of the old adage "like produces like," as he was not only got by a creditable performer on the turf, but also inherits from his dam and her progenitors the stoutest strains of trotting blood, judging from the performances of their offsprings, that are known to the world. He is a trotter by breeding and instinct and about as near the "thoroughbred trotter" as can be reached at the present day.

Patron was sired by Pancoast, 2.21¾, dam Beatrice by Cuyler, 2nd dam Mary Mambrino by Mambrino Patchen, 3rd dam by Embry's Wagner, 4th dam Lady Belle by Bellefounder jr., 5th dam by Kosciusko. Pancoast, 2.21¾, was sired by Woodford Mambrino, 2.21½, by Mambrino Chief, dam Bicara, by Harold, (the sire of Maud S., 2.08¾), 2nd dam Belle by Mambrino Chief. Cuyler (the sire of Patron's dam) was by Rysdyk's Hambletonian, dam Grey Rose by Harris' Hambletonian by Bishop's Hambletonian, and Mambrino Patchen the sire of his grand dam is a full brother to Lady Thorne, 2.18¼, being sired by Mambrino Chief, dam by Gano, son of American Eclipse.

This royally bred youngster received his early lessons at the stables of Cope Stinson in Brantford, and it was while in the careful hands of that accomplished trainer he first showed signs of the wonderful speed, which raised him in his three-year-old form above any colt of that age that has ever been foaled.

His first appearance in public was on the 2nd of September, 1884, in a sweepstake for two-year-olds, at Brantford, on a half mile track. His opponents were Josh Billings and Great Scott. The race was finished in very short order, Patron distancing the field in the first heat, which was trotted over a heavy track in 2.42½. This mark is to-day the two-year-old record of Canada. Soon after this the speedy youngster was returned to Glenview, at the request of the late Mr. J. C. McFerran, to be trained for his three-year-old engagements. His tutor from that time to the present was G. J. Fuller, the head trainer and driver at Glenview.

Patron's first appearance in 1885 as a three-year-old was at the Washington Park Breeders' meeting, Chicago. Rarely does such a fine lot of three-year-olds face the starter as did that day. They were Manzanita, by Electioneer; Silverone, by Alcyone; Eagle Bird, by Jay Bird; and Greenlander, by Princeps. Manzanita won the first, second, and fourth heats in 2:23½, 2:23½, and 2:24½, Silverone winning the third in 2:25¾. Patron was one length behind Manzanita in the first heat. The performance was a good one, and his owners and trainer were confident that with a little more work he would soon be able to turn the tables on his opponents.

The result proved that they had not overestimated the wonderful speed and remarkable gaminess of the colt. His second appearance was at St. Louis, in the three-year-old stake. The contest was a battle royal, and after six heats, every one of which

was fought out to the bitter end, Patron proved the victor. The first two heats were won by Manzanita in 2:23½ and 2:24½, Patron being second in the first and third in the second. Patron won the third heat in 2:23¾, and Silverone the fourth in 2:24½, Manzanita being second and Patron third. But the bay colt by Pancoast had too much reserve speed for the party, and he went in and won the fifth heat without a mistake in 2:24¾, and the sixth in 2.26¾. The hour of his greatest triumph, however, had not yet come, but it was at hand. On October 17th, 1885, at the Breeders' meeting at Lexington, Ky., he again met Silverone and Granby, by Princeps, and disposed of them in straight heats; time, 2:20½, 2:25, 2:19¼. This race had been looked forward to with great interest by breeders. Many of the shrewdest horsemen present at Chicago and St. Louis having formed the opinion that the Canadian representative only required a little more keying up to prove his ability to beat 2.20. Both the first and second heats were keenly contested.

The third heat was his crowning triumph. The trio went away well together, and at the quarter, which was reached in 35¼ seconds, Patron and Silverone were trotting head and head. Down the stretch they went, like a team, to the half in 1.10¼. From the half to the three-quarters they were lapped, Patron having increased his lead a trifle. Up the hill and coming into the stretch Silverone was again at Patron's throat latch, and it was a great race to the distance, where Silverone was eased up, and Patron came to the wire in hand in 2:19¼. This performance tied Hinda Rose's, the celebrated California filly, three-year-old performance, which was made over a specially prepared track, with everything in her favor, while this was made over a track fully two seconds slow and in the way all records should be made, viz., in a race with other horses.

HARRY WILKES, 2.15.

Harry Wilkes is a handsome bay gelding, 15 hands one inch high, foaled May, 1876. He was sired by the great George Wilkes, dam Molly Walker, by Captain Walker, (pacer) son of Tecumseh; 2nd dam by Darnaby's Copperbottom; 3rd dam by Kosciusko, son of Sir Archy; 4th dam by Fox's Whip, son of Rhode's Whip, by Blackburn's Whip. A glance at his breeding is sufficient to convince any one acquainted with blood lines that he is game to the core, and possessed of lightning-like speed. For who ever saw one of George Wilkes' get faint hearted, much less slow when in its veins the old horses blood was united with the whirlwind speed of the pacer. Harry Wilkes has the honor of holding the fastest record, 2.15, of the more than two score sons and daughters of the great son of Rysdyk's Hambletonian and Dolly Spanker now in the 2.30 list. The noted gelding Wilson, 2.16¼, coming next.

He was bought as a two-year-old by W. R. Letcher, of Richmond, Ky., for $500, and it was his intention to keep him entire, but was gelded as a four-year-old after he had sired seven foals. As a six-year-old Harry Wilkes started in three races and won them all, getting a record over Lexington track of 2:23¼ in the last race. He was not started the following year, but in the spring of 1884 Mr. W. C. France, of New York, purchased him for $6,000 and placed him in the hands of Frank VanNess who trained and drove him in his numerous victories and recently purchased him.

The 1884 campaign opened on July 4 at Maysville, Ky., where he won the free for all in straight heats. His next appearance was at Pittsburg, where he met such clinkers as A. V. Pantland, Walnut, Tom Rogers, Mambrino Sparkle, Index, Tom Rolfe, Whirlwind Jr., and King Wilkes, and defeated them in straight heats, the three being

trotted in 2:18¼, 2:19, 2:18¾. The following week found him at the Exposition half mile track at the Smoky City. Here he gave the first heat to Walnut in 2:26, and then went on and won in hollow style in 2:24, 2:24½, 2:23.

From Pittsburg VanNess brought the game little gelding to Cleveland and entered him through the grand circuit. He started in the 2:23 class and secured first place handily after losing the first heat to A. V. Pantland, the fastest heat being trotted in 2:19.

At Buffalo the following week he met the renowned mare Catchfly in the 2:19 class. It was predicted that she would stop him before the race was finished. He, however, went on and won it in one, two, three order in 2:18½, 2:16½, and 2:17, there seeming to be no limit to his speed. Seven started in his class at Rochester the following week. Catchfly won the first heat in 2:18½, and Harry Wilkes the next two in 2:17¾ and 2:17½. The fourth heat was won by Catchfly in 2:19½. In the fourth, which was trotted in 2:20, the gelding beat her out an open length, but the heat and race was given to the mare on account of a foul.

After winning at Utica the following week, he started in the great $10,000 purse at Hartford, which he won after losing a heat to King Almont, the fastest heat being 2:17.

At Springfield he beat Majolica (2:15), and the great Canadian mare, Phyllis (2:15½), winning the last three heats handily, the third being in 2:15, his present record. During the second week of September he defeated Clemmie G. at Providence in a hard fought six heat race, the fastest heat being in 2:16½; but the big chestnut mare, by Magic, turned the tables on the gelding at the Boston meeting.

At Albany he trotted an exhibition mile in 2.16½, and then went south to the Texas Circuit, where he and the great mare Phyllis met at nearly every meeting in the Lone Star State. The great campaign opened at Paris in October, where he beat the mighty daughter of Phil Sheridan in straight heats. After winning again at Sherman the pair went to Gainesville, where Phyllis won the first two heats; but Wilkes took the next three handily, the fastest being trotted in 2.19. The same field fought it over again at Fort Worth on the following week, and the gelding won after Wagner had landed two heats. Phyllis, however, defeated him at Waco in four heats, one of them being dead between them.

After trotting two exhibition miles at San Antonio in 2:18 and 2:21, and winning a straight heat race at Austin Fair, he went into winter quarters.

During the season of 1884, he won sixteen out of nineteen races, trotted fifty heats better than 2.30, and twenty-seven of them in 2.20 or better. His purse winnings amounted to $15,275.

The campaign in 1884 was a very brilliant one, but his performances in 1885, although not so numerous, were of a much higher order. After winning a series of good races he was matched against the famous stallion Phallas, 2:13¾, who had recently defeated Maxey Cobb, 2:13¼, and Majolica, 2:15. The race was trotted at Philadelphia, Pa., and Harry Wilkes proved the victor in very slow time considering the class of horses competing. After a second match had been trotted with the same result he was pitted against Clingstone (The Demon), 2:14. They met at Detroit, and the son of Rysdyk and Gretchen was too fast that day for the game Wilkes gelding and won in straight heats. This was his last race in 1885. Shortly after this he was taken to New York by Mr. France, his owner, who has since sold him to his trainer and driver Frank Van Ness.

LITTLE BROWN JUG, 2.11 3-4

Little Brown Jug, who paced the three fastest heats ever made in a race, is a brown gelding, 15.1 hands high, foaled April 26th, 1875, at Moorsville, Tennessee. He was sired by Tom Hal, dam by Bryants, he by Clipper by the original Tom Hal; 2nd dam by John Eaton (thoroughbred). Tom Hal was by Kitral Hal, of Kentucky, he by the original Canadian Hal, dam by Adam's Stump the Dealer, by Old Timoleon; 2nd dam by Whip.

The history of Little Brown Jug reads like a page of romance. He was sold by the man who bred him to a Mr. Frye, when one year old, for $27.50, and he in turn disposed of him when two years old for $50. His new owner broke him as a two-year-old, and plowed with him alone all summer, and then, lest the colt would not get sufficent exercise, his whole family rode him about the country, thus imposing upon him burden enough to kill any ordinary horse. The brown pacer again passed into Mr. Frye's hands the following year for a mere trifle. Nothing, however, was done with him that season, but as a four-year-old he was given to a local trainer to handle. His speed developed rapidly. Before many weeks he could show a 2.20 clip. Mr. Frye refused, what was then thought to be an excessive price for him ($500), for the pacer was not very popular at that time. The next season, when he was five years old, and as fast as a bullet, he was entered through the circuit, and was sold while at Jackson, Michigan, for $2,600 to Mr. H. V. Bemis, of Chicago. Shortly before this he had given indications of that magnificent speed capacity which enabled him to pass all pacing records, and head the list until the advent of the marvellous Johnson.

The season of 1880 was a short but brilliant one, but that of 1881 was one of the most memorable in the annals of the track. It was one long series of triumphs culminating in the celebrated three heats at Hartford, in 2.11¾, 2.11¾, 2.12½. which still remain the three fastest consecutive heats over any track.

The season opened at Washington, D. C., and Little Brown Jug struck the key note of his campaign by winning the 2.30 class purse in straight heats, the fastest being 2.19½. He also won, but without lessening his record, at Fort Wayne, Ind., Jackson, East Saginaw, and Grand Rapids, Michigan. He also defeated Buffalo Girl at Ionâ, in straight heats, in the 2.20 class; but in the free-for-all was defeated by Mattie Hunter, although he put in the second heat in 2.17¼. Little Brown Jug also played second fiddle to the whitefaced mare at Pittsburg, when he drove her out in 2.14¾. He changed the programme, however, at Chicago in the 2.20 class a few days later. The distance was waived, and the phenomenal side wheeler was sent three fast miles. That he spread eagled the field goes without saying. He left them so far behind that the multitude forgot them, for the three heats were paced in 2.12½, 2.14½, 2.14½, the fastest thre heats ever paced or trotted up to that time. After failing to lower his record at Washington Park, where it was made, he went to Buffalo, and started in the free-for-all. He won the first heat with ease in 2.13¾, but in the next heat he made a bad break and was distanced. At Rochester, however, on the following week, he redeemed the Buffalo accident by defeating the same field in straight heats, in 2.15, 2.15, 2.16. After failing in an attempt to lower his record at Utica, he was sent on to Hartford, which was to be the scene of his greatest and crowning performance.

On the 24th of August Lucy and Mattie Hunter and Little Brown Jug started in the free for all, at Charter Oak Park, Hartford, for a purse of $2000, which race proved to be the fastest ever trotted or paced in the world. Hartford has been the scene of

many famous performances, before and since, but the wonderful performance of Little Brown Jug on that day cast them all into the shade. Even now, after a lapse of nearly five years, his performance stands as the three fastest consecutive heats ever trotted or paced. It goes without saying that he won the race in straight heats in the fastest time on record—2.11¾, 2.11¾, 2.12½; an average of 2.11¾ for each heat. The last quarter of the second heat was paced in 31¼ seconds, or 2.07 gait, and the heat could have been paced in 2.05.

At Chicago, in September, at a matinee against time he paced a mile in 2.12½, and on September 30, at Louisville, in an attempt to lower his marvelous record, finished a mile in 2.12, same outside matches making it 2.11¼, and repeated it next day. Such is a brief record of his wonderful campaign which opened in May and closed on the first day of October, in which the champion side-wheeler paced forty-seven heats at an average of 2.09 or better; twenty-two in 2.10 or better, and thirteen in 2.14 or better.

In April, of 1882, Mr. H. V. Bemis, owing to ill health, having decided to dispose of his stable of trotters and pacers, sold Little Brown Jug to Commodore Kitson, of St. Paul, for $17,500. The season was opened at Redwing, Minn., when he defeated Gun for a special purse on a half mile track in 2.16½, which time is only half a second slower than the wonderful half mile track performance of the trotter Rarus, which heads the roll. After adding two more victories to his already long list at Hastings, Minn., and Grand Forks, Dak., he was sent on to Chicago, where he was sent against his record, but failed, the track being slow. A few weeks later, he paced a half mile at Buffalo in 1.04, and a mile at Rochester in 2.17½. His last appearance was at Poughkeepsie, N.Y., where he was started to lower his record, but failed. Since then corns in his feet have cut short the career of this wonderful pacer, and now the once despised two-year-old colt passes his days in regal magnificence in his owner's palatial stables at St. Paul, having the king of the pacers, whom he never met in his career on the turf, Johnson, 2.06¼, for a stable companion. Whether he will ever return to his old form, and again startle and delight his thousands of admirers, or not, is a mystery. Nevertheless, in the history of the track, he will ever remain as the monarch of his time, and his unapproached three heats in an actual race, 2.11¾, 2.11¾, 2.12½, is likely for a long time to remain the grandest demonstration of gameness and speed ever performed, either at the trotting or pacing gait.

BLACK CLOUD, 2.17 1-4.

Black Cloud is a jet black horse, with a small star, elegant in conformation, with a fine head and neck, bright, intelligent eye, and as fine legs as ever were seen on a thoroughbred. He stands plumb 16 hands, is a natural trotter and is, without doubt, a horse of marvellous speed, courage, and endurance. The breeding of Black Cloud is peculiar, having a combination of Mambrino Chief and pacing blood that is rarely met with. He was sired by Ashland Chief, by Mambrino Chief, sire of Lady Thorn, 2.18½, one of the greatest trotters that ever lived, and other fast ones. His dam, Old Lady, by Captain Walster (pacer), was also the dam of Jessie Kirk, of the sensational trotter Majolica, 2.15, by Startle, and of the dam of the wonderful trotting gelding Harry Wilkes, 2.15, whose performances have excited the trotting world during the last three years. His second dam was by Parish's Pilot (pacer), and his third by Old Brown Pilot, son of Copperbottom. Thus we see the strong blood of Mambrino Chief

in Ashland Chief, which had been supplemented by a thoroughbred cross from his dam, is united in Black Cloud with three direct strains of speedy pacing blood. Black Cloud's turf career was one of extreme brillancy, and had it been the ooject of his managers to secure for him the lowest record attainable, he would have unquestionably wiped ont, before Phallas or Maxy Cobb appeared upon the scene, Snuggler's 2.15¼, which stood as a barrier for so many years. All his victories were won in stubbornly contested races and the fastest mile to his credit (2.17¼) was the third heat in a race in which his three winning heats were trotted in 2.19¼, 2.18¾, and 2.17¼.

His greatest performance, however, was when he won the match race with Jerome Eddy, at Buffalo, for which the association gave a special purse. It was, without a doubt, one of the hardest struggles that ever was fought out on any course and it placed the names of the two great stallions high up on the scroll of fame. Black Cloud and Jerome Eddy were the two sensational stallions of the year. They had swept all before them, and when the word went forth that they were to meet at Buffalo, horsemen from far and near flocked to see the contest for well they new it would be a battle royal, and so it was. Jerome Eddy won the first heat in 2.16½, his present record. Black Cloud won the second in 2.18¼. Two dead heats followed which were trotted in 2.19 and 2.20 when the race was postponed to next day.

When the pair appeared upon the course the next afternoon the excitement was intense. They had trotted two dead heats and each had a heat to his credit, the bay son of Louis Napleon was slightly favored as his winning heat was one and three quarter seconds faster than that of his opponent. The calculations, however, came to nought, for the black offspring of Ashland Chief and old Lady went on and won the fifth heat in 2.18½, and the sixth heat and race in 2.19¼. Black Cloud added many more victories to his already long list of triumphs after this hard fought battle, but never did he meet an opponent so worthy as the son of Louis Napoleon and Fanny Mapes. He has now been retired to the stud and worthily holds the premier position at W. V. Wagner's Stock Farm, Marshall, Michigan.

ALCANTARA Jr., 3703.

Alcantara Jr., is a bay horse, foaled April 28, 1883, and owned by Dr. W. B. McGowan, Montreal, Canada. He was sired by Alcantara, who obtained a four-year-old record of 2.23 dam Bourbon Belle, by Administrator, 2.29½; 2ad dam Bourbon Girl, 2.30¼, by McDonald's Manbrino Chief; 3rd dam Belle, by Alexander's Abdallah; 4th dam by Star Highlander.

Aicantara Jr., is a horse of very high finish. His head is a remarkably intelligent one, and its clear and boney outlines, fine muzzle, prominent bright eyes, thin tapering ears, and general gamey look, gives evidence of the rich blood that flows in his veins. His shoulders are deep and muscular, his eyes broad, clean, flat and low, and his feet perfect. In appearance he bears a striking resemblance to his illustrious sire, and is possessed of that powerful Wilkes' gait with which Alcantaras' get are all endowed.

The breeding is also of the finest, and when one investigates the many famous speed lines which are concentrated in this horse he cannot but pronounce him one of royal lineage. For his blood, together with the performances of his ancestors, puts him on an equal footing with the best living. His sire Alcantara, 2.23, was got by George Wilkes, 2.22, and has even at this early stage of his stud service proved himself a producer of

speed two of his get (Alpha, 4 years, 2.25½, and White Socks, 2.28½), having already entered the 2.30 list. George Wilkes has paternal grandsire is without doubt the greatest sire that has up to the present time appeared in trotting annals. He is now in his grave, but he has left behind him a career that no man living will see repeated. His performances on the track are without parallel, even at the present day. He trotted two miles without an effort in 4.44, and pulled a wagon half a mile in 1.04½. He was equally at home as a pole horse, or to a wagon either road or skeleton; in fact, nothing came amiss to him as is proved by his harness record of 2.22, wagon, 2.25, and double, 2.28, all of which he beat several seconds in severe and oft repeated trials. He was kept very busy on the turf until this seventeenth year, 1873, when he made his first season in Kentucky. At the close of 1885, he was credited with forty-one performers in 2.30 or better, and stood second in the list of speed producing sire, eclipsing even his famous sire Rysdyk's Hambletonian, the Hero of Chester, who spent all his life in the stud, and only six less than Blue Bull. Alma Mater, the dam of Alcantara, is also the dam of Alcyone, 2.27, the sire of the three-year-old filly Silverone (2.24¼), that drove Patron out in 2.19½, at Louisville, Ky. She was got by Mambrino Patchen, full brother to Lady Thorn, 2.18¼, the trotting Queen of her day.

Alcantara Jr.'s dam Bourbon Belle was sired by Administrator, by Rysdyk's Hambletonian, who not only had a record of 2.29½ himself, but also produced Catchfly 2.18½, one of the gamest, fastest, and finest gaited mares that ever wore harness; McMahon, 2.21, and Executor, 2.24¼. His dam Dolly Heystead was by Mambrino Chief, thus giving Alcantara Jr. one more cross of that famous strain, which gave the trotting turf so many brilliant performers.

Bourbon Girl, 2.30¼, the grand dam of the subject of this sketch was got by McDonald's Mambrino Chief, the third strain of this blood, and his great grand dam Belle, by the famous Alexander's Abdallah, the sire of Goldsmith Maid, 2.14, and Almont with twenty-nine performers in 2.30 or better, and other famous speed producers.

KENTUCKY PRINCE, Jr. (3139).

Kentucky Prince, Jr., is a beautiful chestnut stallion, foaled 1874, standing 16 hands high and is owned by Mr. T. H. Love, Montreal, Qu. He was sired by Kentucky Prince (2470). by Clark Chief, (89), who was a son of the great Mambrino Chief (11); dam Patchienie, by Mambrino Patchen (58), who was also got by Mambrino Chief (11); 2nd dam by Clay Trustee, by Imp. Trustee, out of Imp. Lady Scott; 3rd dam by Southern Eclipse. A glance at the above is sufficient to show any one conversant with pedigrees, that Kentucky Prince, Jr.'s lineage is an exceptionally strong one, and that the speed inheritance from such potent blood lines must be productive of good results.

His sire, Kentucky Prince, has proved himself a speed producer, having such performers as Bayonne Prince, 2.21¼, Spofford, 2.28½ in his roll of honor, while his grand sire, Clark Chief, the sire of Cloxie, 2.19¼, Woodford Chief, 2.22¼, and four others in the 2.30 list, is one of the most coveted sons of Mambrino Chief, the sire of the world-renowned Lady Thorn, 2.18¼. Mambrino Patchen, the sire of his dam, was the greatest son of that famous horse, and with his thirteen performers in 2.30 or better, headed by Loudon, 2.20½, will stand for all time as a famous trotting sire. In a word, his breeding is superb, he being an inbred Mambrino Chief, with a sandwich of Morgan

blood through Kentucky Queen, the dam of his sire, and the whole on a firm foundation of thoroughbred blood.

Kentucky Prince, Jr., is a monarch of his race, and his conformation is such that it would be difficult to suggest an improvement in any part of him. He has a clear cut, expressive head, large kindly, yet spirited eyes, erect well set ears, a splendid neck and superb shoulders well thrown back, a perfect back, barrel well rounded and loins above criticism. His legs are fine, but strongly muscled, powerfully jointed and resting on the very best of feet. In motion he has that bold open swinging stride which only a born trotter can possess.

Although only twelve years of age, and with a very limited opportunity in the stud, Kentucky Prince, Jr., has in the black gelding, J. Q., 2.29¼, one representative in the 2.20 list. J. Q. could have trotted handily in 2.21 or 2.22 in 1885 had he been asked. The race in which he made his record was one of the best three minute races trotted at Pittsburg, Pa., for years. There are many more youngsters now in Kentucky by him, possessing speed enough to place them on the roll of honor, and it will not be long before the horsemen in the vicinity of Montreal will be on the same footing. It is true individual merit that makes the sire, not fine looks and a fashionable pedigree; but when a horse possesses all of these requisites, so much the better. These are all combined in Kentucky, Jr., and he cannot fail to become a famous sire of trotters.

MAMBRINO KING.

Mambrino King, "The handsomest horse in the world" (1279), is a dark chestnut horse, foaled 1875, bred by Dr. L. Herr, Lexington, Ky., from whom he was purchased by C. J. Hamlin, Esq., proprietor of the Villiage Farm, fifteen miles from Buffalo, N. Y. He was sired by Mambrino Patchen (58), brother of the celebrated trotter, Lady Thorn, 2.18¼, by Mambrino Chief (11); dam Alexander's Edwin Forrest (49), by Bay Kentucky Hunter; 2nd dam by Birmingham; 3rd dam by Bertrand, etc., etc. Referring to the 2.30 list, we find two of his get, Lady Mac, 2.25¼, and Amy King, 2.28½, included in the trotting roll of honor.

Mambrino King stands 15.3 hands high, and was pronounced by the French Commissioners the handsomest horse in the world. In him strength, intelligence, courage and good breeding are united with symmetry and style.

He has never been put in trotting condition, but has often been driven by Dr. Herr and his colored groom, quarters in 34 and 35 seconds. In the fall of 1881, he showed in an exhibition trot at the Lexington Fair, when he was speeded a half mile in 1.14; jogged to the half-mile pole, and repeated in just exactly the same time, without a break or the least urging. He wears light shoes and no toe-weights. Mr. C. J. Hamlin paid a large price for him, and during the short period he has been located at Village Farm not less than twenty-five thousand people have called to see and admire him. This magnificent horse is described as follows by a Cincinnati writer:

His rich, satin-like chestnut coat glistening in the sunlight, more handsome in his exquisite proportions, and lofty in his splendid carriage than the proudest Nedjed Arabian of the desert. Indeed, as he stood before us, his eyes flashing and his gazelle ears pointing forward, and his arching neck revealing the delicate network of swelling veins, and his symmetrical barrel revealing every contour of equine beauty, and his full,

flowing tail, gracefully floating like a gossamer banner, we thought that if he could be instantly transfixed into marbel, he would remain forever the sculptor's model of an ideal horse."

The following is an extract from the official report of Baron Favorot de Kerbeck, French Colonel of Dragoons, who was deputed by his government to make an extensive tour of inspection of the horses of America:

"Mambrino King is the most splendid specimen we had the opportunity of admiring. Imagine an Alfred de Dreux, a burnt chestnut, whole colored, standing 15.3 hands, with an expressive head; large, intelligent and spirited eyes; well opened lower jaws, well set ears; the neck and shoulders splendidly shaped, long and gracefully rounded off; the shoulders strong and thrown back well; the withers well in place and top muscular, the ribs round and loin superb; the crupper long and broad; limbs exceedingly fine; the joints powerful; the tail carried majestically, and all the movements high and spirited—imagine all this, and you will have an idea of this stallion. He is as open, if you look at him in front, as he is in his hind quarters—the whole animal being an embodiment of purity of lines, elegance and elasticity. He is, in fact, perfection."

PANCOAST, 2.21 3-4.

Pancoast, the subject of this sketch, was bred by A. J. Alexander, at Woodburn Farm, Kentucky, and sold with the whole crop of trotting bred colts of that year, when a weanling to Messrs. Baker & Harrigan, of Comstock, New York, and purchased from them by the late J. C. McFerran & Son, of Glenview Stock Farm, when he was two years old, where he is now owned.

Pancoast is a beautiful mahogany, foaled 1877, and stands 15½ hands high. He was sired by Woodford Mambrino, (2.21¼), dam Bicaria, by Harold; 2nd dam Belle by Belmont.

This pedigree is remarkable, as all the crosses entering into it are through the best individuals of the tried and most popular speed producing families, and making the horse standard under all the rules known and recognized by breeders of trotting horses.

Woodford Mambrino, (2.21¼), Pancoast's sire, was not only the greatest son of Mambrino Chief but was also one of the greatest trotters of his day. He was also the greatest speed producer produced by his famous sire, having eleven 2.30 performers bracketted opposite his name. Of Harold, the sire of his dam Bicaria who was a full sister to McCurdy's Hambletonian, 2.26¼, it is hardly necessary to speak, he being so well-known to the world by the unequalled performances of his peerless daughter the Queen of the trotting turf, Maud S., 2.08¾. Belmont, the sire of Pancoast's grand dam, Belle, is by Mambrino Chief, thus giving this great young horse a second cross of that stout strain. Belmont is considered one of the best sires living, and as the sire of Nutwood 2.18¾, Wedgewood 2.19, "the unbeaten," and nine other flyers on the 2.30 list occupies a very enviable position in the minds of breeders. Pancoast is a horse of great muscular developement. He has a well-shaped, game-looking head, with an expression of great resolution, broad between the eyes, deep jowels and very wide apart, neck strong, right side up and not coarse, oblique shoulders and big middle piece with smooth full coupling, round hips and grand stifles, so that standing broadside or behind him he appears to great advantage.

His legs are the very best, broad, clean, flat and hard. Altogether, he is a horse of great substance combined with quality. He has a level, well-balanced brain, a perfect disposition, and a gait that is faultless.

Pancoast first made his appearance on the trotting turf as a six-year-old in May, 1883, when he was beaten in straight heats by Mambrino Sotham, 2.26¾, now owned by Dr. W. A. Willoughby, Colborne, Ont. His second attempt, however, was more successful, when, in September he defeated Molly Mack at Louisville, Ky., in straight heats, and getting a record of 2.25¾ in the third. On Sept. 27th he won a stallion race at Chicago in straight heats, defeating Independence and Highland Chief handily. Two days later he secured another straight-heat victory, defeating Big Soap and Waiting in 2.28, 2:28, 2.26.

Starting on September of 1884, after a busy season in the stud, he defeated Kitty Van and Whirlwind at Pittsburg, Pa. On the 13th of October he met McLeod, Lena Swallow, Kitty Silver, Defender, Mystery and Blanche Clemens at Louisville, Ky., in what proved to be his last race, and defeated them. McLeod won the first heat in 2.24. Pancoast won the second, and, in doing so, secured his present record (2.21¾). He also won the third and fourth heats in 2.24¼, 2.24.

When we consider that Pancoast was foaled in 1877, consequently is but eight years old, it would scarcely be expected that he would be conspicuous as a sire of trotters, notwithstanding his rich heritage and splendid performances. But in this particular capacity he has proven himself not only the peer, but the superior of any stallion of his age. The oldest of his get that have been trained is the mare Issaquena, that made a record of 2.28 in 1885 as a four-year-old, at a meeting of the National Breeders' Association at Albany, N. Y., winning the race in three heats. Aquarius, a three-year-old stallion by Pancoast, dam by Cuyler, made a record of 2.29½ at the same meeting in a walk over.

But the sensational colt of 1885, and the one that makes the name of Pancoast familiar to every Canadian horseman, is Patron, 2.19¼, the greatest three-year-old that ever appeared, owned by Messrs. Merrill & Scott, Tilsonburg, Ont. Patron is fully described in one of the foregoing articles, and his wonderful performance at St. Louis alone, when he won the hardest race ever trotted by colts of his age, was sufficient to make his sire famous without his wonderful performance at Lexington a few weeks later, when he trotted the last heat in a race in the unparalleled time for horses of his age of 2.19¼.

YOUNG ROYAL GEORGE.

Young Royal George is a dark bay horse with a star in forehead, and stands 15 hands 2 inches high. He was foaled in 1878, and is the property of Mr. S. W. Bradshaw, Belleville, Ont. He is by Prince of Wales, by Old Royal George, he by Black Warrior, son of Tippo, dam by Mazeppa; 2nd dam by Black Hawk, 3rd dam by Blacklock.

The Royal George family may be considered as the foundation upon which the Canadian trotting families are built. Old Royal George was foaled in 1844, and got by Black Warrior, a son of Tippo. He was the founder of the tribe. Charley Douglas, Grantham Chief, Royal George (Field's), Springville Chief, Toronto Chief, and the fam-

ous trotting mare Lady Byron, 2.28, sprang from his loins. Charley Douglas sired Cora, 2.29¼; Grantham Chief got Commodore Nutt, 2.29; Field's Royal George produced Byron, 2.25½, who got Ottawa Chief 2.25, and General Love, 2.30. He also got from a mare by Smith's Flying Childers the famous horse Howe's Royal George. This horse sired Caledonia Chief, 2.29½, the sire of Tommy B., 2.29¾, and Erin Chief, the sire of the bay mare Syndicate, 2.25½, and whose early death was one of the heaviest blows ever received by Canadian breeders of trotters. Springville Chief is credited with Leon Boy, 2.29¾. Toronto Chief is, however, the greatest representative of Old Royal George. He was himself a trotter, as his record of 2.31 shows, and a producer of speed, having sired Thomas Jefferson, 2.23; Lady Hamilton, 2.30, and Belle of Toronto, 2.30. He also sired the dams of Joe Pettit, 2.30, and Toronto Maid, 2.28½. His sons have also proved themselves to be speed-producers, and transmit with great uniformity the trotting gait of Old Royal George. Thomas Jefferson has eight representatives on his roll of honor, Royal Revenge three, Niagara Chief two, and Jones' Toronto Chief one.

In Canada the Royal Georges have kept their end up to the last few years, even against the produce of horses imported from the adjacent kingdom. The bay gelding, Russian Spy, 2.26½, by Murphy's Royal George began trotting ten years ago and is still holding his own against the flyers of Europe at Vienna, Austria, to which place he was shipped a couple of years ago. Murphy's Royal George also got Tom Jefferson, 2.31¼, owned by Mr. James Booth, Orangeville. The grey gelding General Beamish, 2.26¼, by King George was also owned by Mr. Booth when he was burned.

There is also very good grounds for claiming the Washburn Horse, the sire of Moose, 2.19½—in fact, some do claim it—as a son of Royal George. But leaving all suppositions aside, and taking the hard facts before us, we must accord the grand old son of Black Warrior a very high position as a sire. When we take into consideration the class of mares served by him and his get, no one can pronounce him other than a wonderful producer of trotters. The breeding of the dams of nearly every one of his sons is wrapt in obscurity, or, if not unknown, was largely thoroughbred. Still the individuality of this horse was so great as to stamp all of his get, not only with an instinct to trot but also transmitted it to them in such a marked degree that they transmitted it to their offsprings and their get. For example we find Toronto Chief trotting in 2.31 and his son Thomas Jefferson in 2.23. He in turn produced John S. Clarke 2.19¾, Lizzie M. 2.20¼, and six others with records better than 2.30.

Prince of Wales, the sire of Young Royal George, the subject of this sketch, was also the sire of the dam of that grand horse, Young Wilkes 2.28¼, by George Wilkes and the dams of many good horses in Western Ontario.

Mazeppa, the sire of Young Royal George's dam, was a cream-colored stallion with white mane and tail, standing 16 hands, of unknown breeding. Mazeppa's own merits, however, were quite sufficient to give his progeny a reputation both as stayers and for speed. In 1852 this high class horse defeated Blind Hookie in a twenty mile contest at Hamilton. Of the Black Hawk it is unnecessary to speak at any length. Sound, strong, speedy and serviceable horses by them are to be found in every part of Canada. As roadsters they have but few equals, and their disposition is good. In appearance they nearly all possess the conformation of the old Morgan horse, from which source the Black Hawk tribe sprang.

MILL BOY AND BLONDINE.

Boston's champion team is owned by Mr. John Shepard, one of those gentlemen who honor the turf by their support. A leading merchant of the American Athens, he has always taken a prominent part in encouraging and developing the trotting track, and the manly and healthful recreations on the road.

The American roadster, the educated trotter and the perfect road team, are equally his pleasure and delight, and when he drove Mill Boy and Blondine in 2.22 his pleasure was enchanced by the fact that it was fully reciprocated by his large circle of friends, and by horsemen of the country. In the race for fame Mr. Work, with Edward and Swiveller cut down the record, and later Mr. Cohnfield has eclipsed all previous efforts with Maxey Cobb and Netta Medium, but Mill Boy and Blondine will always remain famous as one of the grand teams that once showed the way, and can still challenge for the lead in the city by the sea.

H. B. WINSHIP AND MATE.

This famous black gelding was one of the phenomenal trotters of 1884, his record to sulky being 2.20¼, and with mate 2.06. Winship is 9 years old, 15¼ hands high, sired by Aristos, son of Daniel Lambert, dam by Col. Moulton, making him an inbred Lambert. James Golden, of Boston, purchased Winship as a road horse for Mr. Barnaby, paying Mr. Baldwin and party, of Ticonderago, N. Y., $2,500 for him.

At Providence, August 1st, Winship and running mate, Gabe Case, was offered $1,000 to beat 2.08½, the time made by Frank and mate, with $500 additional if 2.07 was beaten. Golden first brought him out to sulky, and gave him a warming up mile in about 2.37, Bither, with Phallas, accompanying him on the trip. Then Winship was given a few moments as a breather, and directly after he came out to wagon with his mate. Only once or twice did they swing up and down, when they came towards the wire with a rush, and with a machine-like steadiness they are on the way. The team reached the quarter in 30½ seconds, with the black gelding a head in front of the runner. Down the back stretch they keep up the pace, and at the half in 1.10½, they still move level; on around the turn they spin off the same clip, passing the three-quarters in 1.43¾, and it seemed as though both sets of figures would be wiped out. As they round into the home stretch, and straighten out a young man on a runner ranges up alongside. The clip is terrific, and right up to the wire they seem to gather speed. Without a break the mile is done in 2.06, the record is broken, and time is beaten by two and a half seconds.

RAVEN.

Raven is a black horse, with a blaze and two white ankles behind, foaled in California 1875, stand fifteen hands three inches high, and is owned by Mr. T. H. Love, Montreal, Que. A glance at his pedigree is sufficient to show that he is not only fashionably but stoutly bred. Monday, his sire, was also the sire of that magnificent mare Mollie McCarthy, and was got by Colton, dam Mollie Jackson. Camille Urso, the dam of Raven, was sired Lodi, dam Annette. In the next remove we notice a double cross of Lexington and one of such famous sires as Vandal and Imp. Yorkshire.

Raven performances on the flat and over hurdles proves him to have been a horse of excellent quality, and his services will no doubt be a valuable acquisition to the breeding interests of the Province of Quebec.

MINTING.

Minting is by Lord Lyon out of Mint Sauce, thus commingling on his sire's and dam's side some of the very choicest blood in the history of the English thoroughbred. His Lordship though in his day the hero of the triple event, viz.: the Two Thousand Guineas, the Derby, and St. Leger, has not been a great success as a sire, and we are now dealing with far and away his best representative. Minting is described by competent critics who closely looked him over to be one of the grandest looking two-year-olds that ever appeared on the English turf, in fact he has been described as looking as well finished as a first-class appearing four-year-old.

Minting, who was bred and trained by Mr. Vyner, made his first appearance in 1885, at Gosforth Park, in July, in the Seaton Delaval Stakes, which he won from a very fair field. At Goodwood in the Prince of Wales Stakes he had a very easy run for a rich prize, and he had an equally soft time in the Champagne Stakes at Doncaster, where he beat Gay Hermit and Philosophy. His fifth and last race of the season was also his most important one, it being the Middle Park Plate, in which he defeated such cracks as Saraband and Braw Lass.

FREELAND.

No thoroughbred horse on the American continent attracted so much attention by the brilliancy of his performances during the racing season of 1885, as the bay gelding Freeland, owned by Mr. E. Corrigan, of Kansas City. His three victories over Miss Woodford, (Billett—Fancy Jane), the hitherto unconquered mare of the Dwyer Bros, and whose unparalleled performances had won for her the name of the Queen, stamped him not only her superior in speed, but also the fastest horse of his year.

Freeland was bred by Mr. Frank Harper, Midway, Kentucky, and was foaled in 1879. He was sired by Longfellow, son of Imported Leamington, out of Belle Knight by Knighthood, out of Kentucky Belle by Woodwood. It is unnecessary to describe in detail his many brilliant victories. He has met and defeated the best horses on the American turf, and has proved himself first class at all distances. He has worthily upheld the reputation of his great sire, Longfellow, whose mighty struggle with Bassett will be long remembered by lovers of the thoroughbred.

HYDER ALI.

No better bred or higher quality of race horse was ever brought to Canada than Hyder Ali. Unfortunately, the horse was badly managed, and Mr. Lyon, who had imported him, becoming disgusted with the poor encouragement extended, decided to part with him. General Rowett, of Illinois, caught him while in the humor, and bought the horse at a price which, in the light of his after accomplishments, must many times have made him think of the good bargain he made.

Hyder Ali was bred by A. Welch, Eidenheim Stud, Pa., and was foaled in 1882. He was sired by the famous horse Imported Leamington, dam Lady Duke, by Lexington, grand dam, Magdalen by Medoc, great grand dam by Sumpter. As a two year old, he started in three races and won once; the promise of his racing career was a great one,

when it was cut short by an injury, in the spring of his third year. The lines upon which Hyder Ali is bred, have produced the greatest racing family of the age, the Leamington cross on Lexington mares having resulted in such sires as Aristides, Enquirer, Onondaga, Powhatan, and Sensation, all of whom have established their reputation in the stud or on the race course, a reputation which, with each succeeding year, becomes brighter and more enduring.

When Leamington left the shores of England, the English breeders had no conception of their loss, nor did American breeders have any adequate idea of their gain. The blood of Leamington has improved and enriched wherever it has gone, and while many of its grandest results have been developed in conjunction with the crimson tide of the immortal Lexington, the banner of his fame had been grandly sustained on course and paddock by Eolus, Lelaps, Longfellow, Reform, Iroquois, and many others whose dams were not sired by the marvelous son of Boston and Alice Carneal.

Hyder Ali has commenced his career as a winning sire, and has already proved that the rich inheritage of his ancestors has been transmitted by him to his offspring. Conkling, out of twelve starts, in 1884, scored five victories. In Lady of the Lake he had one of the best two-year old fillies of the west: out of nine races, she scored four victories. His best representatives on the turf in 1885 were the two-year old brown colt Waddell Bryant, out of Jenny Rowett; the three year old Mary Hamilton, Grey Cloud Lady of the Lake, and the four-year old Conkling also proved themselves excellent performers in good company.

PONTIAC.

The black colt Pontiac, by Pero Gomez—Agenoria, was one of the brightest stars of the American turf in 1885. He won the Suburban Handicap at Coney Island Spring Meeting, beating such cracks as Richmond, Rataplan, Euclid, and a lot of others. He also placed the Passaic Stakes at Monmouth to his credit, and by his victory in other events proved himself a racehorse of great merit. Pontiac's dam Agenoria was purchased by Mr. Pierre Lorrillard at the Doncaster autumn sale of 1880, for 880 guineas, along with her brother, Pizarro, and they arrived in America on the steamer Italy with Mortemer. Agenoria was in foal to Pero Gomez, and the following spring dropped Pontiac at Rancocas. He was the fastest yearling tried at the farm in 1882, doing his three furlongs in 37 seconds. In October he was shipped with Choctaw, Comanche, Emperor, De Soto, Parthenia, Pinafore, etc., to England, where he performed better than any of the lot. He was third for the Woodcote, beating Scot Free, who afterwards won the Guineas; was second for the New Stakes, beating St. Medard and others, while at three he ran a dead heat with Cambusmore for second place in the Ascot Derby, and it will be remembered that Cambusmore won the St. James' Palace Stakes the next day. Pontiac was then brought back to America.

CLYDESDALE HORSES.

The model Clydesdale stallion should be about 16½ hands high, and weigh, in moderate flesh, 1,800 lbs. His head is a moderate size—not too bony looking, nor yet clumsy—but wide between the eyes, ears medium length and active. Eyes large, full

and bright, expressive of both mildness and vigor. Neck good length, and well arched, but not necessarily high for draft purposes. Shoulders should be deep and powerful, and not too perpendicular, or the action of the fore legs will be hampered. Fore arm should be strong and heavily muscled; the knee broad; cannon bone short, strong, and broad from a side view; pasterns good fair length and well sloped forward; feet pretty large and well spread, with heels prominent and tough in substance; hair on legs should be soft and silky looking—coarse, matted hair and round bones should be avoided. Chest should be full and broad; back short and pretty straight, with ribs well sprung, and coming well down on the flank—avoid long bodies, wasp waists and loose couplings. Hind quarters should be lengthy, broad and powerful; thighs strong and well covered with muscle; hocks broad, clean and free from all appearance of fleshiness; legs flat and strong, descending almost perpendicularly from point of hock to pastern joint; pasterns tolerably long and sloping well forward—if pasterns are too short and steep the action cannot be free. In walking, the Clydesdale horse should have a long, swinging, rapid gait, and when trotting he should bend the fore knees well and move square and straight, getting well over the ground. The action of draft horses is not closely enough scrutinized in this country, many people's minds being carried away by an extra high-headed horse going at a furious rate for a short distance, while he may neither have square action nor staying power—qualities of far greater importance.

A mare for breeding purposes let her be only a medium size, not too far from the ground, but long, deep, and roomy, with good legs, pasterns and feet, mild disposition, and well bred. Many people attach too much importance to fineness of neck and formation of body, and too little importance to legs and feet, which are really the fundamentals and ought to receive the very first consideration. The buyer should also be careful to satisfy himself as to the soundness in both wind and limb of any animal he may contemplate purchasing, avoiding roarers, wind-suckers, cribbers, or those having ringbones, sidebones, spavins, or any other form of unsoundness.

The Clydesdale horse never was more popular than at the present time, and the same care exercised by Scotch breeders in trying to improve on the old stock has also had the good effect of diminishing from time to time the number of unsound horses in that country. During the last decade there has appeared quite a number of Clydesdale stallions that have earned for themselves almost a world-wide fame, and whose offspring could usually be calculated on for possessing the following very desirable properties in combination, viz.: style, symmetry, substance, perfect shapes, power of endurance, and first-class action. These horses are Prince of Wales, Topsman, Time o' Day, Top Gallant, Macgregor, Belted Knight, and Lord Erskine. As being well worthy of mention in the same category, we would also name the well-known Darnley, Old Times, Farmer the two Prince Charlies (McKean's and Dunmore's), St. Lawrence, and last, but certainly not least, the great Lord Lyon.

Lord Colin, our representative stallion of this breed, was imported from Scotland by the famous importers of draught horses, Messrs. Galbraith Bros., Janesville, Wisconsin. The father of the owners of Lord Colin was a famous Clydesdale breeder, and owned for many years the old Clydesdale stallion Topsman (886), for many years champion draft horse of Great Britain, and winner of $6,000 in prizes and premiums, besides many challenge cups and gold and silver medals too numerous to mention. Topsman was equally renowned as a show horse and as a successful and impressive sire; and many of his sons and daughters have gained the highest honors possible in Scotland, Canada, the United States, and Australia. At the present day no strain of Clydesdale blood is more popular in America than the Topsman strain, and the demand for young stock of that breeding is far ahead of the supply.

SHIRE HORSES.

The typical Shire horse resembles the Clyde so closely that good judges cannot sometimes distinguish the difference between them. He will, however, in general be found a rather larger, bulkier animal, possibly a little coarser in bone and hair, with pasterns less oblique, a heavier neck and crest, with round, ample body, and in many cases possessing more ambition and spirit. A model Shire stallion should possess good, flat, clean bone, nice sloping pasterns and silky hair. Coarse horses with thin, brainless heads should always be avoided. Until recently the majority of English breeders, who have of later date brought this breed to perfection, aimed at producing the maximum of bone, hair and weight, but of late years they have been giving much more attention and greater prominence to the legs and feet of their horses, and the results have been eminently satisfactory. The counties where the most famous Shire horses have been raised, are the fenlands of Lincoln, Cambridge, Derby, and the adjoining counties, while Lancashire has produced many famous animals. The County of Norfolk should also be named as producing among many other well known Shire horses, the great Honest Tom, who gained no fewer than six first prizes consecutively at the Royal Society Shows of England, from 1867 to 1872, a feat, unprecedented in the annals of horse showing. Among other celebrated horses of recent years that have added lustre to the breed, we would mention the well known black horse Spark, Enterprise of Cannock, Esquire, Prince William, winner of the Elsenham 100 guineas Challenge Cup as the best animal at the great London Shire Horse Show in 1885, and whose picture appears on another page; Admiral Beauchief, Smorsham, Lamson, Rutland Champion, What's Wanted, King of Bucks, Bar None, St. Ives, and Royal Sandy, the last named five all being owned by that enterprising breeder and exhibitor, Mr. James Forshaw, who has probably done more than any other man to popularize the Shire horse in England.

The breed has a great future before it, and must of necessity be one of the most favorably known on the American continent in a few years, as the most satisfactory results have been obtained in crossing them with native mares. The only thing that has of late years placed them lower than the Clydesdale in the estimation of people on this side of the Atlantic, is the fact that until a comparatively recent period very few really first-class Shire horses have been imported, the great bulk of them being second or third class animals purchased at small figures for the sole purpose of making large profits to the importers. Affairs have, however, now assumed a different aspect, and as some of the best importers on the continent have gone into Shires, the best horses procurable are being placed at the command of American breeders. Among others who have taken this great initial pioneer step, Messrs. Galbraith Bros., Janesville, Wisconsin, the famous importers of Clydesdales, may be mentioned. And in this their great experience and ripened judgment as draft horse men, has stood them in excellent stead, for their selections has, in the general average, stood the most critical test, when judged from the draft horse breeders' standpoint. The horse, Beau Nash (2978), imported by them, if an excellent specimen of the breed—in fact he is regarded by many as very nearly a model draft horse. He is a brown, foaled 1881, bred by Mr. George Street, of England, got by Beauchief, out of Cardiff Lass, by Britain. Beauchief was by Devonshire Lad, son of the famous old Conqueror, and was a famous prize-winner. Cardiff Lass won first, second, and third prizes at the Royal in 1872, 1874, and 1876. Coming as he does from Royal winners on both sides, the excellence of Beau Nash is no accident, and the record of his pedigree being a history of show-yard triumphs for many generations, and this horse himself, after having won a good share of ribbons on the other side of the Atlantic, signalized his first appearance in the American show ring by carrying off the premier honors at the Minnesota State Fair in 1885.

THE PERCHERON HORSE.

The Percheron horses are usually fifteen and a half to sixteen and a half hands high, but some of the largest varieties are occasionally seventeen hands. In temperament, they are sanguine, mixed in varied proportions with the musco-lymphatic. In color they are nearly all colors, from white through all the different shades to black, which color is very rare. The typical Percheron horse of to-day should approximate to the following model:

Head clean, bony and small for the size of the animal; ears short, mobile, erect, and fine pointed; eyes bright, clear, large, and prominent; forehead broad; nostrils large, open, and red within; jaws rather wide; chin fine; lips thin; teeth sound and even; neck a trifle short, yet harmoniously rounding to the body; throttle clean: crest rigid, rather high, and gracefully curved; mane abundant, with silky hair; breast broad and deep, with great muscular development; shoulders smooth and sufficiently sloping for the collar to set snugly to them; withers high; back short and strongly coupled; body well ribbed up, round, full, and straight on the belly, which is much longer than the back; rump broad, long, and moderately sloping to the tail, which is attached high; hips round and smooth at top, and flat on the sides; quarters wide, well let down, and swelling with powerful muscles; dock strong; tail long, heavy, and gracefully hanging out from the croup when the animal is in full motion; legs flat and wide, standing square and firm, and well under the body; with hard, clean bones, and extra large, strong joints, cords and tendons; short from the knees and hocks down; pasterns upright; fetlocks thin; hoofs full size, solid, open, tough, and well set up at the heels. Height 15 to 16½ hands; weight 1,300 to 1,700 lbs.

The Percherons inherit by nature an aptness for labor, and their mild disposition and well balanced brain makes that trait always reliable and seldom subject to nervous excitement. Their excellent temper is the result of ages of kindness and gentle familiarity of those in whose hands they have been bred. Their remarkable soundness, for which they are famous, has been established by the greatest care in breeding for many generations, until defects, such as ring-bone, curb and spavin, are not even known by name in the country where they are.

Some attribute the origin of the Percheron horse to Arabian ancestry, while many claim that they are deeply impregnated with Arabian blood. Eugene Perrault, one of the most extensive and skillful horse dealers in all Europe, has frequently remarked that of all the races of horses, none were so interesting to him as the Percherons, and that, judging from their appearance and quality, he was convinced they were genuine Arabs, modified in form by climate and the peculiar labor that he has been for ages obliged to perform. There is not, however, in any written history, positive evidence that the Percheron is a pure Arab, but it is easy by fair historical deduction to prove they are in fact. It is well known that after the defeat of the famous Saracen chief Abderame by Charles Martel, on the plains of Vouille, the magnificent cavalry of the enemy fell into the hands of the victors, and the horses upon which they were mounted were, like themselves, from the east. In a division of the spoils a large number fell to the men of La Perche, Orleans and Normandy, who composed a greater portion of the French forces. These horses must of necessity have left in their progeny indelible traces of their blood. La Perche also furnished her contingent of fighting men for the crusades, and the chronicles cite several Counts of Bellesme, Mortagne and Nogent, barons and gentlemen of that province, with many of their vassals, who made pilgrimages to the Holy Land. The Abbé Fait, in a letter directed to the Congress Montagne

July 16, 1843, and in his great work upon La Perche, cites in this connection a Lord of Montdoubleau, Geoffrey I V, and Rotrou, Count of La Perche, as having brought back from Palestine several stallions, which were used, and their progeny most carefully preserved. The limited number of sires, their incomparable beauty and great superiority, must have led to the in-and-in breeding so much deprecated by most breeders of our time, and by which the qualities of the sires became indelibly fixed upon their progeny. It is doubtless a fact that the crusaders from France brought back with them on their return more or less of the eastern blood, which they had learned to appreciate on the plains of Palestine. It has not, however, been preserved elsewhere, and that Perche is so fortunate as to be able to show visible traces of it after so long a time has elapsed, should stimulate them to its careful preservation. It is therefore obvious that for antiquity the Percheron yields to no other French race, and it is conceded beyond question that the soil that has nourished them for so many generations is one of the best in France for developing to their highest state of perfection their physical forces.

The success of the Percheron race has been remarkable. All departments and all nations wish to procure it. The prices of the choicest stallions have increased so rapidly in the past few years, that they have doubled and trebled in value. The authorities have attempted to hinder the emigration their best stallions, by offering large annual prizes for the choicest animals that were retained for service in that country. The project, however, had a contrary effect from what was expected. The prizes served as signs to the foreign buyers, who came to France to purchase the choicest stock, and no surer guarantee than the prize could be had. The owners of such horses cannot resist the almost fabulous prices offered for their stallions, and thus disappears, year by year, the flower of their stallions and brood mares. The Percheron breeders are reaping the benefits of the present, without thinking what will be the effect in the future.

One of the qualities of this breed of horse, and which has acquired for them a a universal reputation, is fast trotting while drawing a very heavy load. What the Percherons do in the diligences, mail and post coaches, is known to every foreign traveller, and it is useless to enlarge upon it. From one relay to another, drawing not less than two and often three thousand pounds in all kinds of weather, over hilly roads, they make their three leagues an hour and sometimes four, but this is *ne plus ultra*. What they do in the omnibuses, the world that visits Paris sees only to admire, and forms one of the greatest attractions of the Percheron horse to the observing stranger.

The settlement of Canada by the French is the date at which the introduction of the French race into North America can be placed. In seeking homes in the New World, they brought with them their own domestic animals, foremost among which were their horses, they being a prime necessity for the cultivation of the soil upon which they were in the future to depend for their support and prosperity. The change from the salubrious climate of sunny France to the cold, bleak hills of the lower St. Lawrence must have been a severe one. But their natural constitutional vigor and hardihood sustained them, although the rigor of the winters, their scanty fare, and the innumerable hardships they were forced to endure, tended to greatly reduce their size and increase their hardiness, establishing for them the reputation as the toughest of all breeds, until "Tough as a Canadian pony" became a common term all over the country in expressing the superlative of hardiness. They were no doubt for many years kept pure; but the conquest by the English, and the consequent introduction of the English horse, soon led to a fusion of the two breeds to some extent — with the most happy results — and many of the most famous horses of our day are traceable to that cross. In fact, the great grandsire of Lulu, who

trotted a mile in two minutes and fifteen seconds, was an imported French horse, and many other famous ones of the same origin.

The Percheron horse was first introduced to the United States by, Mr. Harris, of Moorestown, New Jersey, in 1839. The active commencement of the importation of horses from France, however, dates from 1851, and was made by Mr. Chas. Fullington, of Ohio, and Dr. Marcus, of the same State.

The pair, Marquis and Dolphin, which has been selected to illustrate this very useful as well as beautiful breed of horses, are magnificent specimens of their race. They are owned by Mr. Daniel Dunham, Wayne, Ill., who is one of the most intelligent and successful breeders of this useful race of horses in America, and has been President of the American Percheron Breeders' Association for many years. Mr. D. Dunham is only an occasional importer, and depends more upon his skill as a breeder to build up his stock from an excellent foundation of imported stallions and mares. That his efforts have been crowned with success may be gathered from the fact that Grove Place Stock Farm stands second to none on the continent.

The grey horse, Marquis, 868 (774), foaled 1875, was got by Superior 454 (730), he by Favori I (711), he by Vieux-Chaslin (713), he by Coco (712), he by Mignon (715), he by Jean le Blanc (739); dam Bijou by Coco II (714), he by Vieux-Chaslin (713). The blood of some of the most noted Percheron stallions, tracing back to the famous Jean le Blanc, and through him possessing the blood of the Arab Gallipoli is concentrated in Marquis.

The mare, Dolphin, 1072, was foaled 1878, at Orne, and was imported by Mr. Daniel Dunham in 1880. She is registered in the Percheron Stud Book of France as Favorite (1356), by Favori (725), dam Pauline by Superior (730), 2nd dam Robini by Vieux-Chaslin (713). The foal by her side is registered in the American Percheron Stud Book as Star, 4026, and was got by Marquis.

JAY EYE SEE—2.10.

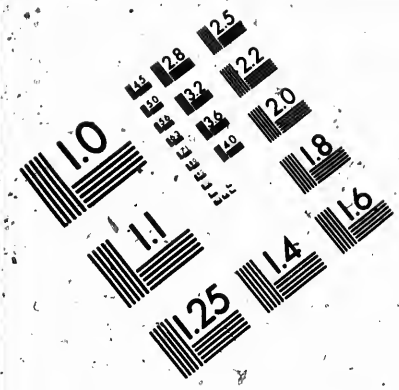
The famous trotting Gelding. Property of J. I. Case, Racine, Wis.

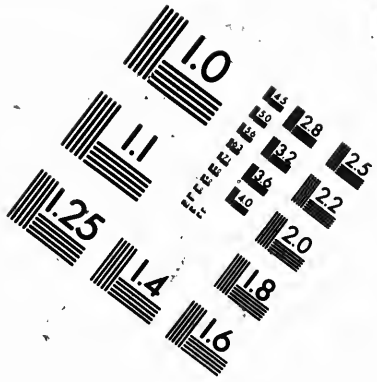
PATRON—2.19¼.

The Champion Three-Year-Old Stallion. Property of Messrs. Merrill & Scott, Tilsonburg, Ont.

PANCOAST—2.21¾.

The Sire of the Renowned Three-Year-Old Colt Patron, 2.19½. Property of Glenview Stock Farm, Louisville, Ky.





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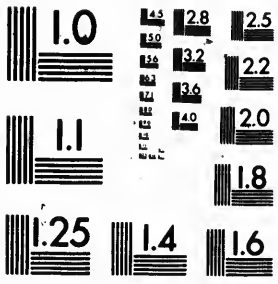

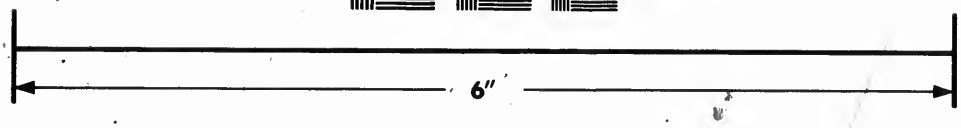

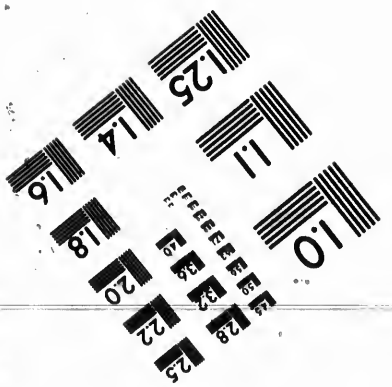

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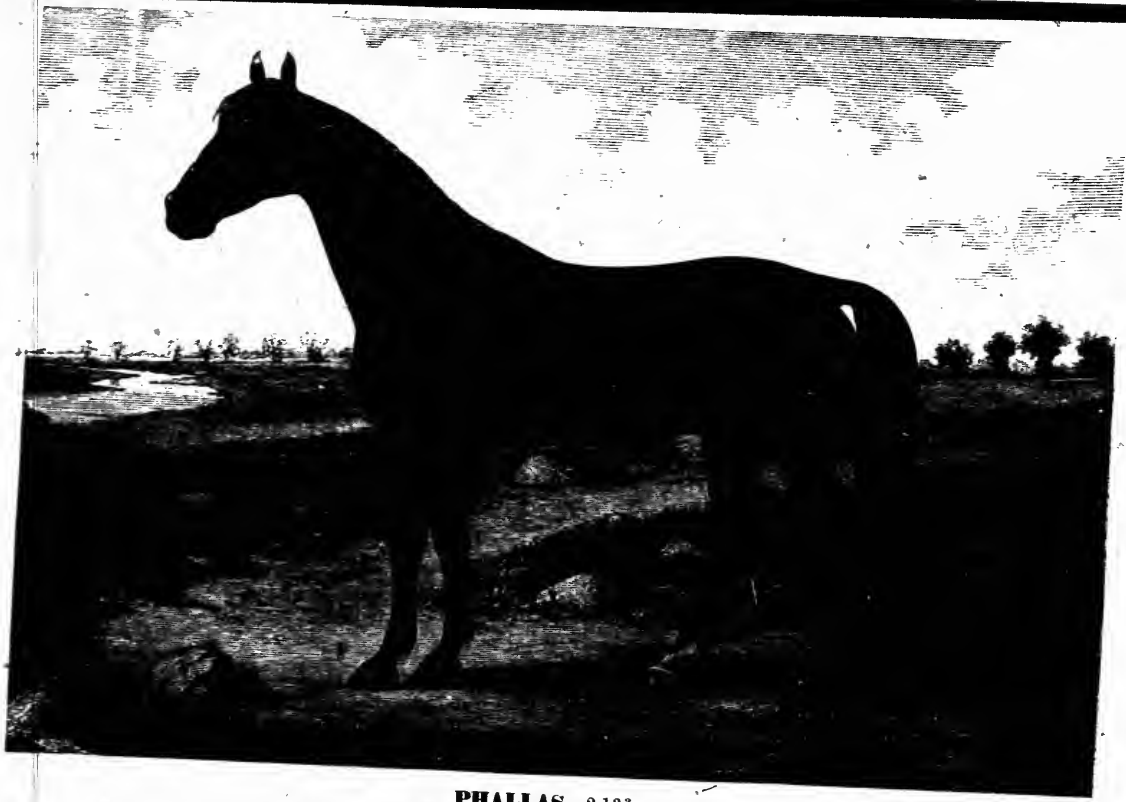


PHALLAS—2.13¾.
The Champion Trotting Stallion. Property of J. I. Case, Racine, Wis.

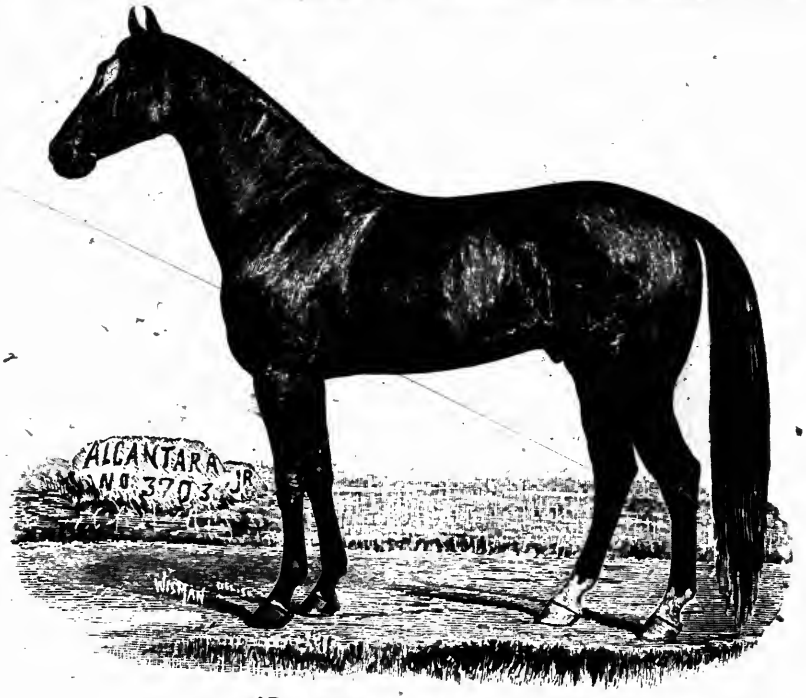
MAMBRINO KING.

Pronounced by the French Commissioners to be the handsomest horse in the world. Property of C. J. Hamlin, at Village Farm, near Buffalo, N. Y.

BLACK CLOUD—2.17¼.
Property of Mr. W. V. Wagner, Marshall, Mich.

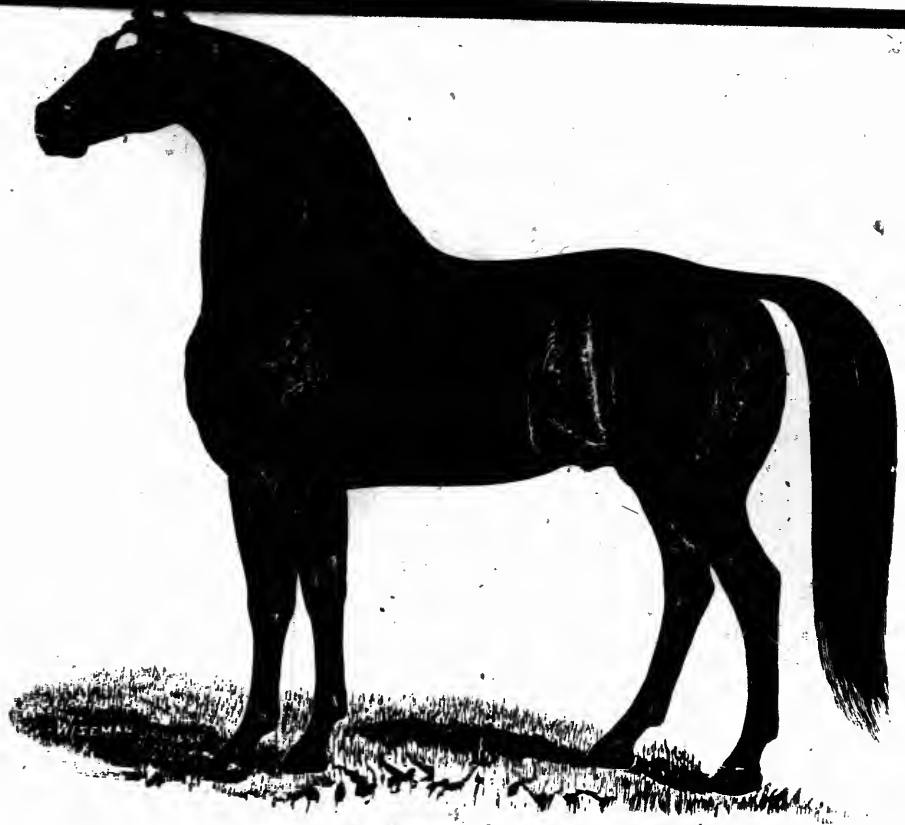
KENTUCKY PRINCE, JR., (3139).

Property of Messrs. T. H. Love & Co., Redbank Stock Farm, Montreal Que.



ALCANTARA, JR., 3703.
The property of Dr. W. B. McGowan, Montreal, Que.

The Thoroughbred Horse, Minting. A great English performer. The property of Mr. Vyner.

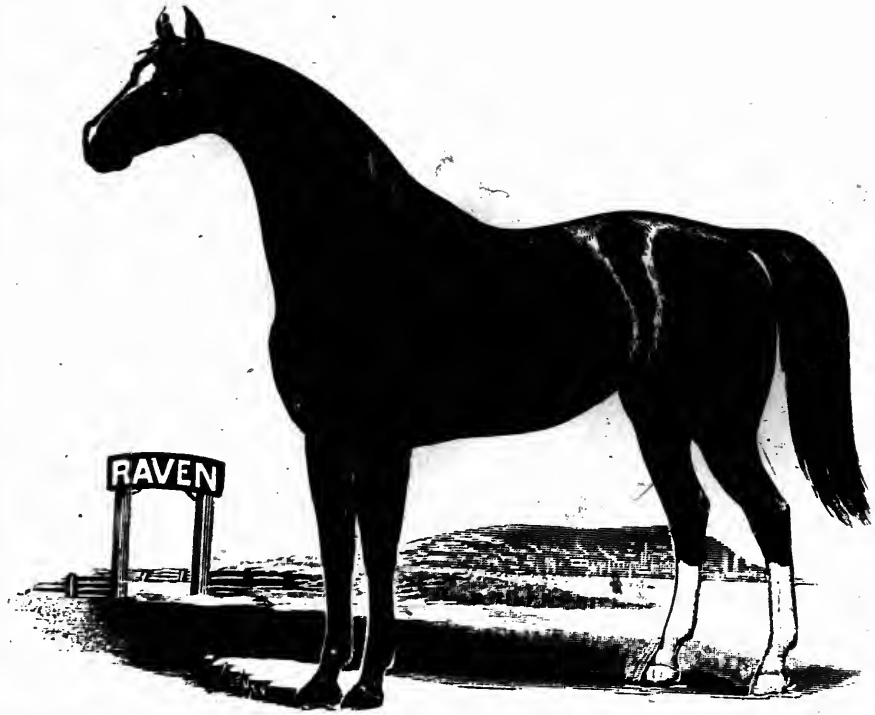


YOUNG ROYAL GEORGE.

A Promising Trotting Stallion. The property of Mr. S. W. Bradshaw, Belleville, Ont.

MARITANA.

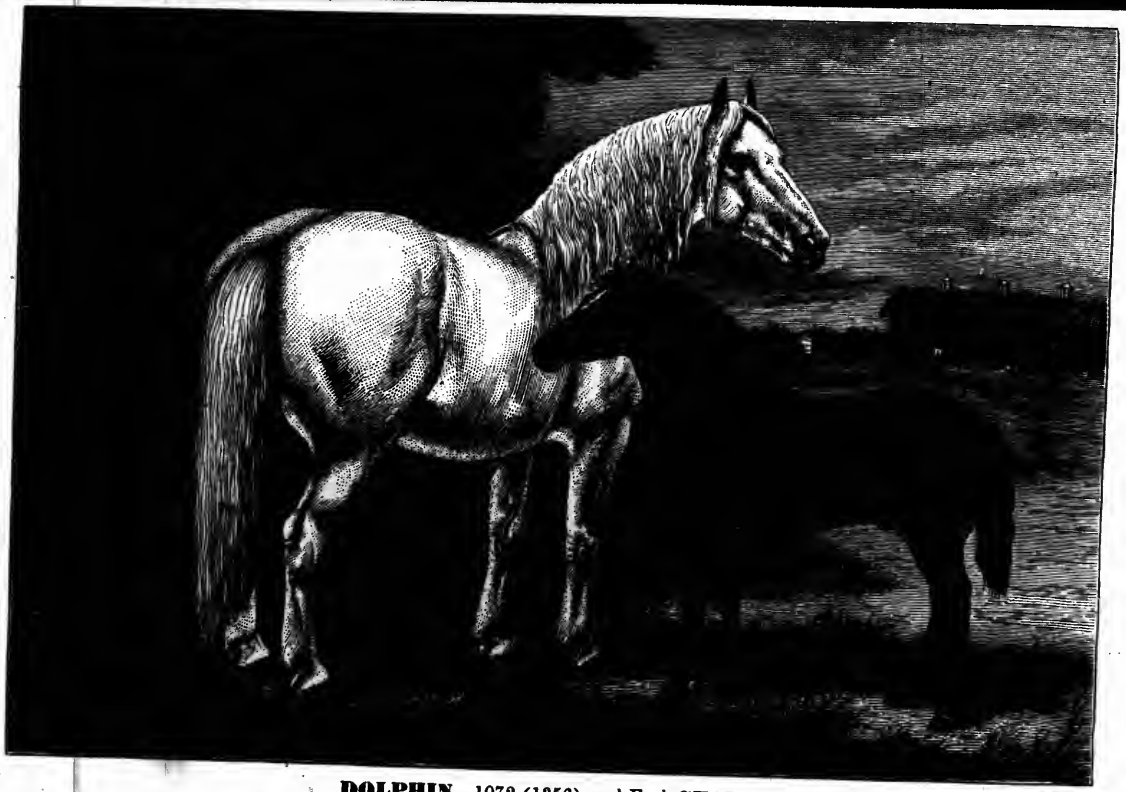
The celebrated Norfolk Hackney. Winner of $8,000 in prizes. Height, 14 hands 2 inches. The property of Mr. William Pope, Downham Market, Norfolk, England.



The Thoroughbred Horse Raven. The property of Messrs. T. H. Love & Co., Redbank Stock Farm, Montreal, Que.

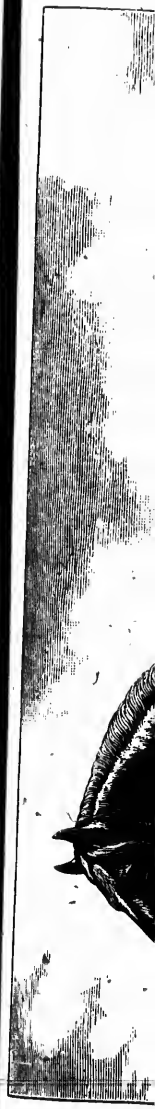
BEAU NASH, (2978).

An Imported Shire Stallion. The property of Messrs. Galbraith Bros., Janesville, Wis.



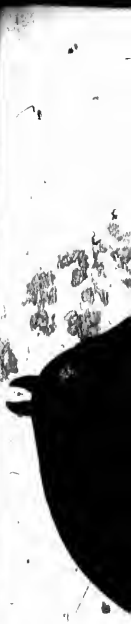
DOLPHIN—1072 (1356) and Foal, **STAR.**

Imported Percheron Mare. The property of Mr. Daniel Dunham, Grove Place Stock Farm, Wayne, Ill.



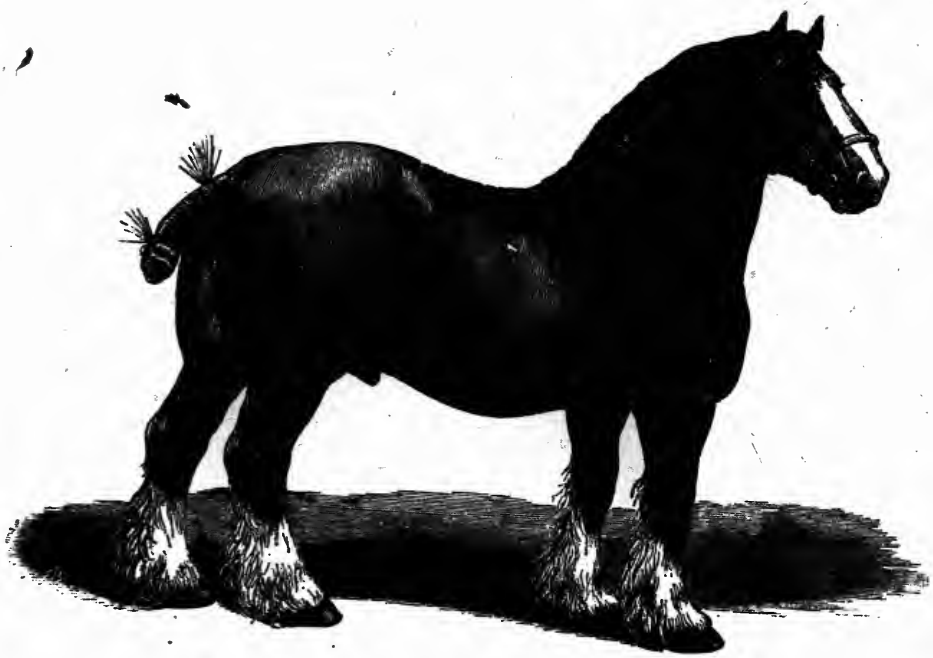
MARQUIS.—868, (774).

Imported Percheron Stallion. Property of Mr. Daniel Dunham, Grove Place Stock Farm, Wayne, Ill.



LORD COLIN.

A Celebrated Imported Clyde Stallion. The property of Messrs. Galbraith Bros., Janesville, Wis.

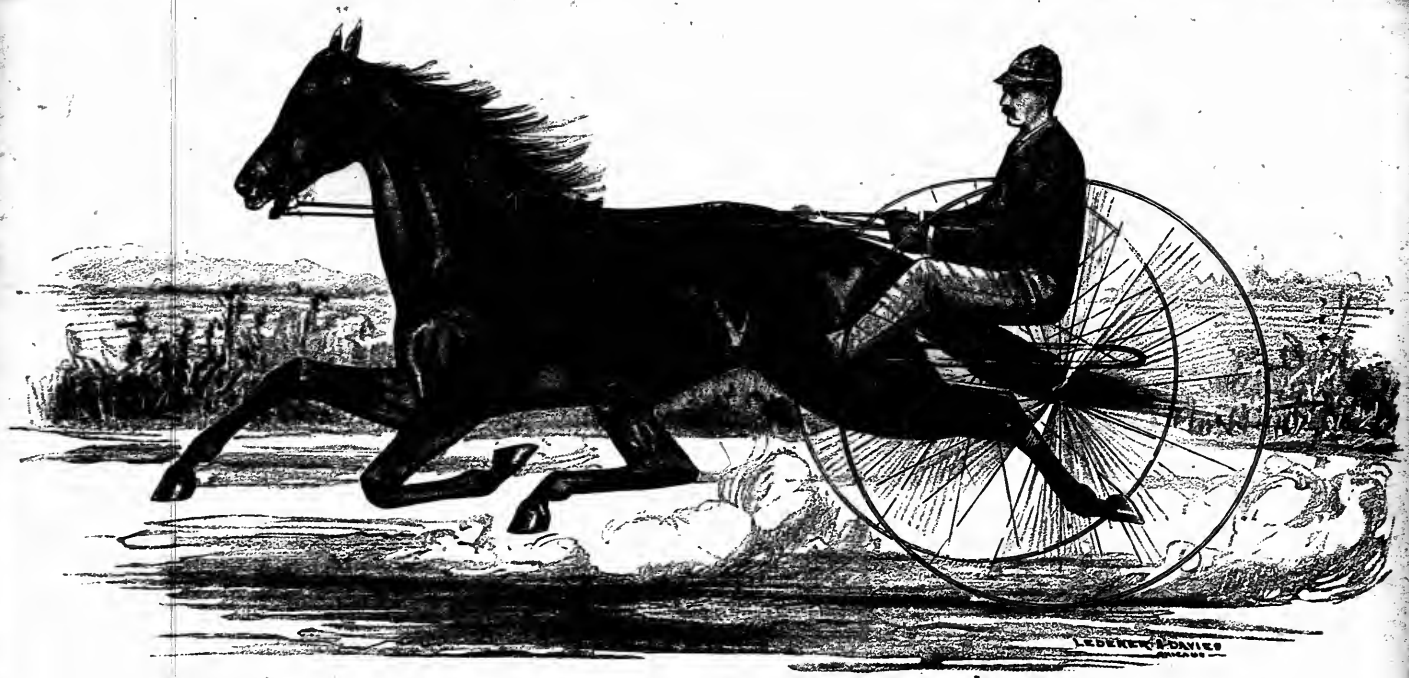


SHIRE STALLION, PRINCE WILLIAM 1st, 3956.

Winner of the Elsenham 100 guineas Challenge Cup, as the best animal at the great London Shire Horse Show; in 1885.

LITTLE BROWN JUG—2.11¾.

Paced the three fastest heats on record—2.11¾, 2.11¾, 2.12¼.

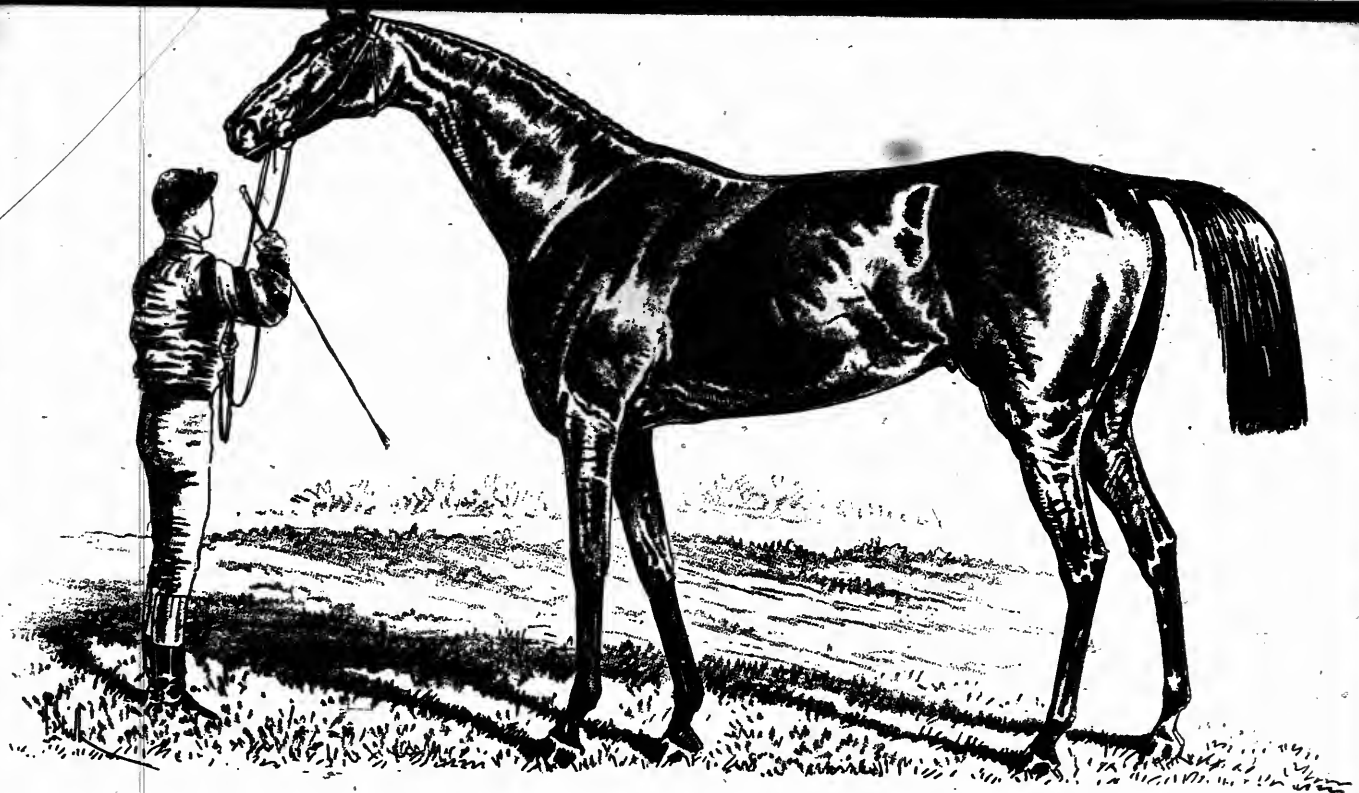


HARRY WILKES—2.15.

The most renowned Gelding now engaged in actual trotting contests on the American turf.

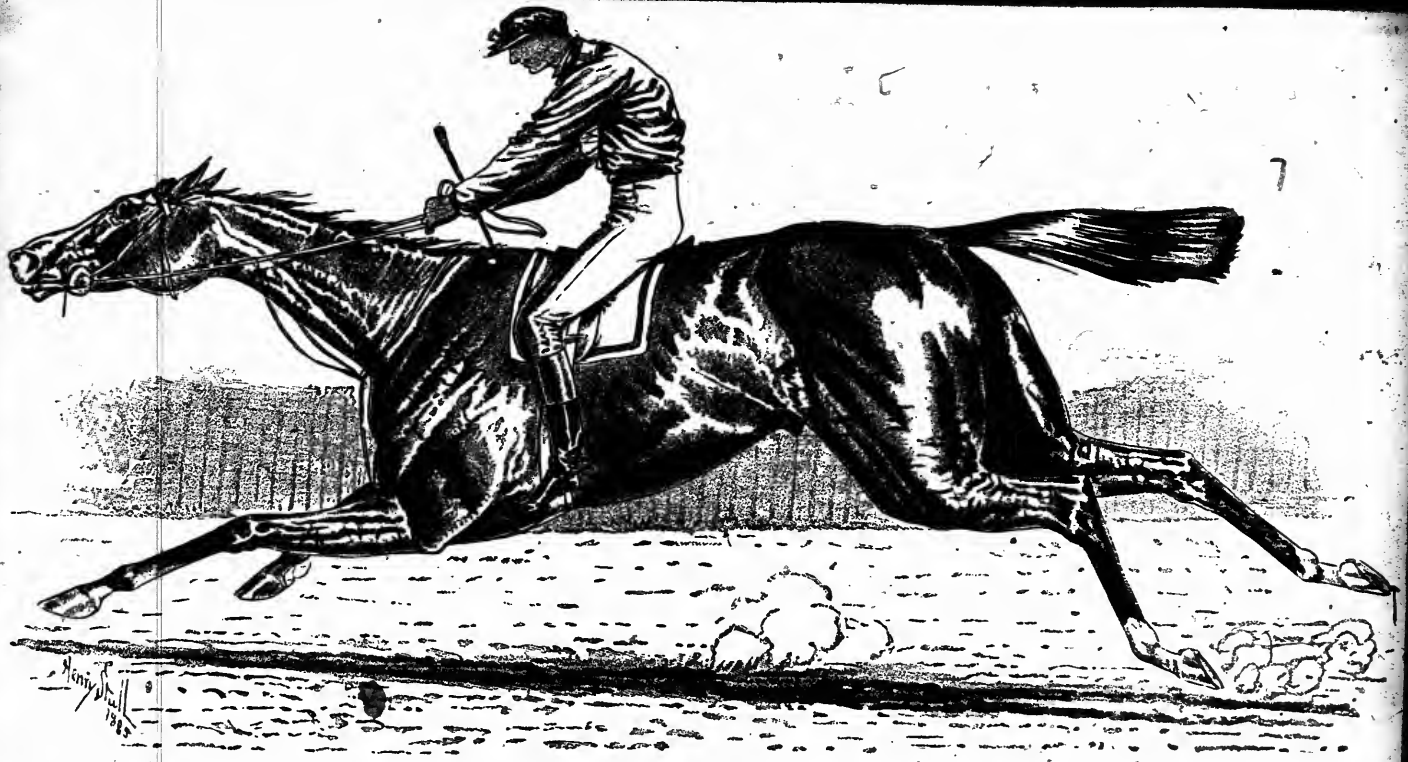
MILL BOY and BLONDINE—2.22.

A famous pair of American Trotters.



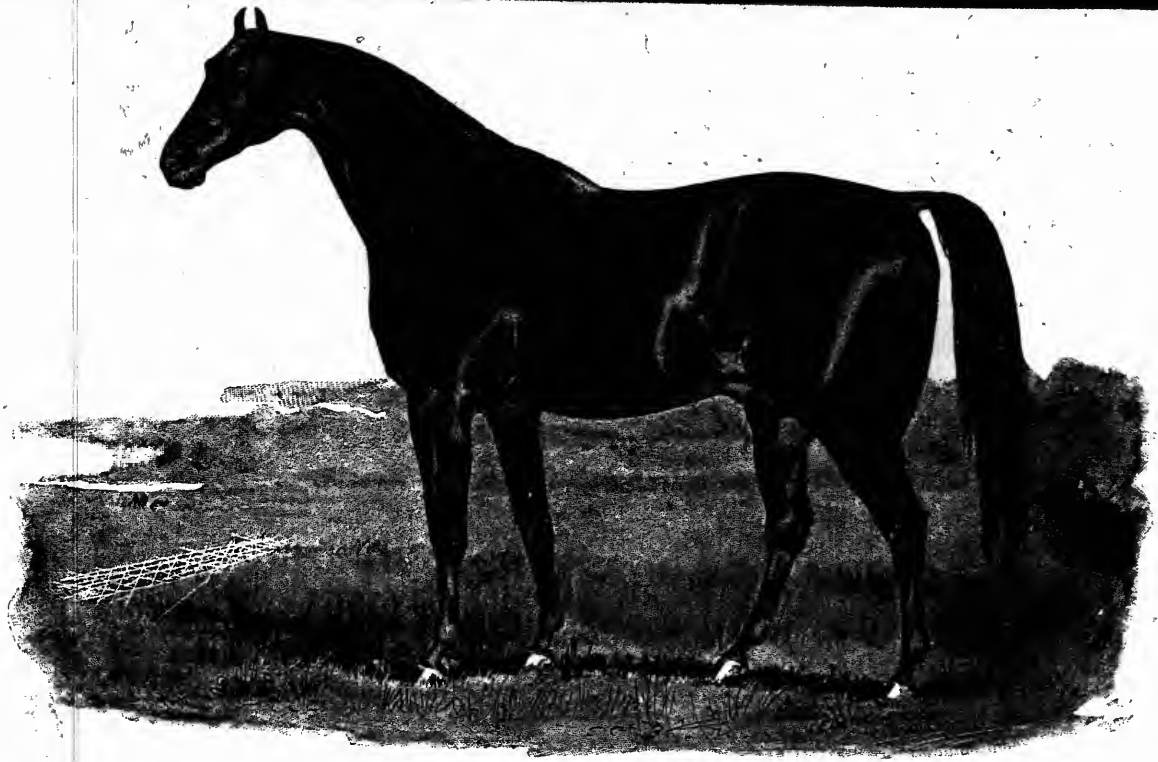
Pontiac

Electro-Light Photo-Eng. Co.



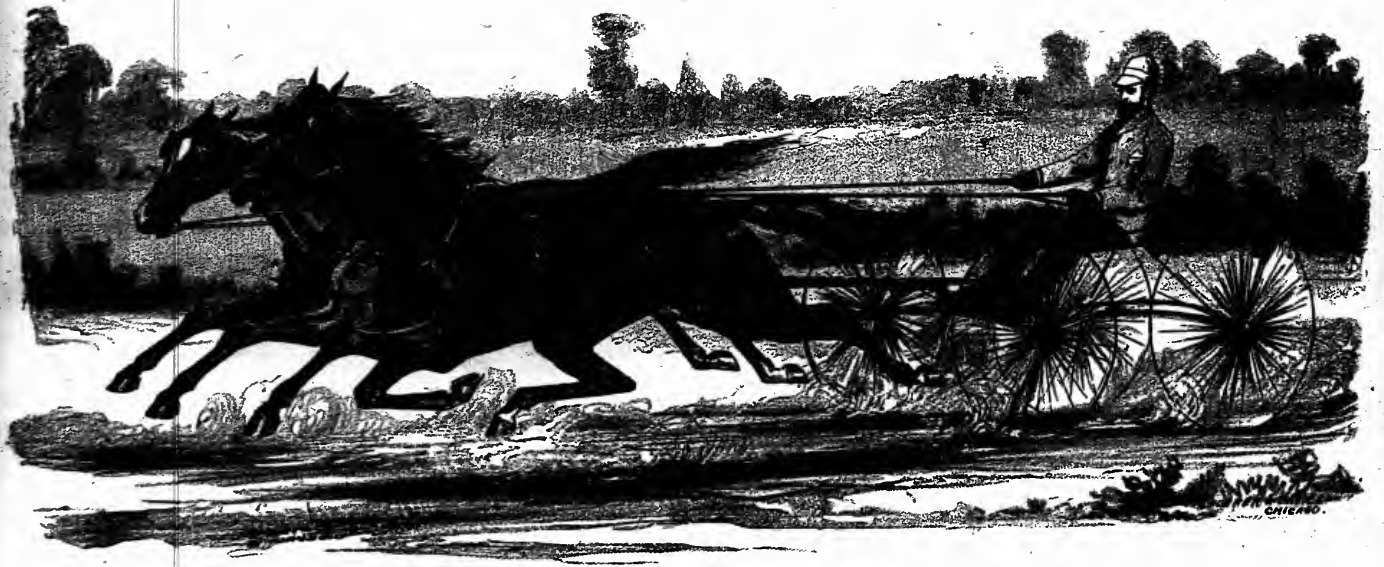
FREELAND.

Champion of the American Turf for the year 1885.



HYDER ALI.

One of the fastest two-year-olds that ever started in the U. S.



H. B. WINSHIP—2.06.

The celebrated Trotting Gelding, with running mate, trotting a mile in 2.06. Property of Mr. H. B. Winship, Providence, R. I.

Diseases of Cattle.

Under this head the intention is to deal with those diseases most common amongst cattle, and to suggest such treatment as has been found most sure to effect a cure by able veterinary practitioners.

The diseases of cattle, many of them are similar to those that affect the horse. Such, for instance as irritation, inflammation and fever are common to all animals, but there are diseases that affect cattle in which there are no counterpart amongst horses, of these latter might be classed contagious typhus or rinderpest, murrain, splenic apoplexy and quarter-evil or black leg.

While the mode of treating disease in cattle must largely be the same as in the horse, one thing must be born in mind, and that is that cows or oxen, owing to the difference in their internal organization, must be given medicine in fluid form only, and not in the form of a solid, as is sometimes done in the case of a horse. The reasons for this are simple. The ox or cow has four stomachs—1, the rumen or paunch; 2, the reticulum; 3, the manyplus; 4, the abomasum. It is, therefore, necessary to give the medicine in a form that it will most easily and speedily pass through the stomachs. In fact it is positively dangerous to give an ox or cow solid medicines, as they are apt to lodge at the bottom of the gullet. In cases of abscess, tumors, sores, ulcers and other diseases common to both horses and cattle the chapter on the diseases of the horse should be consulted.

So as to make it handy for reference the chief diseases that cattle are subject to have been arranged in alphabetical order. The symptoms described and the remedies suggested.

Abortion.—The cow is more than any other any animal subject to abortion, and though it cannot be pronounced prevalent amongst breeders and agriculturalists, it sometimes shows itself very frequently in the neighborhood of cities and in the vicinity of cheese factories. It consists in the cow parting with her calf any time from four to eight months. It is not always easy to tell what is the matter unless the person in charge of the cattle is of an observing mind, then he will soon discover the trouble.

Symptoms.—The cow is off her feed—rumination ceases—she is listless and

dull—the milk either decreases in quantity or dries up altogether, the motions of the foetus are feeble and soon cease altogether, the belly slightly swells, and she is liable to stagger a little in her walk.

As the time of abortion draws close, a yellowish red fluid runs from her (this symptom rarely deceives), and her breathing becomes laborious, until labor comes on, and this is often attended with danger.

Causes.—Abortion is sometimes frequent in some localities and almost unheard of in others. Nearly every farmer is aware that the rank coarse herbage of low swampy ground is injurious to cows. Such districts are great causes of red water as well as of abortion. Feeding upon too much slop or other milk secreting material, insufficient food of any description. Sudden change from poor to rich food. Turning cows that have been poorly fed during the winter, on to rich pasture in the spring, and fright from whatever cause may produce the trouble,

The consequences of premature calving are often of a serious nature. The animal very soon again becomes in heat—but often fails to become pregnant, but if she should get in calf she is very liable to again abort.

The calf very rarely lives, and in the great majority of cases it is born dead or putrid. When the latter is the case it must be got rid of at once and the only safe way to accomplish this, so as to avoid the danger of infecting the other cows, is to remove it as far as possible from the cow pasture and bury it deep in the ground. The safest plan for a farmer to adopt if he has in his herd a cow that has once aborted, is after her recovery to get rid of her, this is by far the most profitable course to adopt in the long run. The following able article on this subject was lately published by Professor Henry Tanner, of Queen's College, Birmingham (Eng.):

"I shall not go into any notice of the general subject of abortion, but rather restrict my remarks to a cause which is very much overlooked, and yet which is probably more influential than all other causes combined. I refer to the growth of ergotized grass-seeds in our pastures.

"The action of ergot of rye (*secale cornutum*) upon the womb is well known as an excitant to powerful action, which usually terminates in the expulsion of the fœtus. We have a similiar disease appearing on the seeds of our grasses, but especially on the rye grass, and thus we have an ergot of the seeds of rye grass produced possessing similar exciting powers upon the womb to those produced by the ergot of rye.

"Two conditions are necessary for the production of this ergot upon the seed of rye grass. The first is, the grass must be allowed to run to seed; and the second is, that the climate must be favorable for encouraging the development of the ergot.

"In practice, we find that on land which has been fed on during the summer, unless it has been grazed with unusual care, much of the grass throws up seed-stalks and produces seed. In districts where the climate is humid

and rain abundant, as well as in the very wet seasons, these seeds become liable to the growth of this ergot. Cattle appear to eat it with a relish, and the result is that abortion spreads rapidly through the herd. Heifers and cows, which, up to the appearance of the ergot, have held in calf, are excited to cast their calves by consuming it in their food. The abortion having once commenced, we know that the peculiarly sensitive condition of the breeding animal will cause its extension, even where the original cause may not be in operation; but their combined action renders the loss far more serious. If we add to this the tendency which an animal receives from her first abortion, to repeat it when next in calf, we see how seriously the mischief becomes multiplied.

"A somewhat extended observation, added to my own experience, has led me to the conviction that very much of the loss arising from abortion in our cows may be traced to the cause I have named. I feel assured the influence is even more extended than I have stated; for not only would the fœtus be thrown off in its advanced stage, but also in its earlier growth, thus causing great trouble to breeders of high-bred stock, the repeated turning of cows to the bull, and at most irregular intervals.

"The remedy differs in no respect from the ordinary mode of treatment, except that it compels removal of the stock from the influence of the cause. Much, however, may be done by way of prevention; and this I shall briefly notice.

"It simply consists in keeping breeding cows and heifers upon land free from these seeds. Grass which has been grazed during the summer, will very generally, in a humid climate, have some of this ergotized seed; but I have not observed it produced before the end of July, or early in August; and I doubt its existence, to any injurious degree, up to this time. We may, therefore, consider such ground safe up to this period. If the breeding stock are then removed to grass land which having been mown for this operation is a guaranty against any seeds remaining, it will seldom, if ever, happen that any injury will result from the production of ergotized grass later in the season.

"I will not venture to say that such will not appear in some cases where the grass has been cut early and has been followed by a rapid growth; but, at any rate, we have grazing land free from this excitant from July until September; and in the grass which has been mown late, I do not consider that there is the least fear of ergot's being again formed in that season. In this manner a farmer may keep grass land for his breeding stock entirely free from ergotized grass; and, consequently, so far as this cause is concerned, they will be free from abortion."

Abomasum.—The fourth or true stomach of the ox, and also of the sheep.

Angle Berries.—Warty-like excresences, which differ from the ordinary wart by having a stem or neck to them.

Treatment.—Cut them off with a knife or pair of scissors.

Anemia.—This term is applied to a weak condition of cows, called *want of blood*, and is more common than most persons are aware of. Cows are not selfish; the more they get in feed, the more they will generally give in the form of milk and butter.

Symptoms.—Whiteness and clearness of the lining membranes of the nose, mouth, and eyes are sure indications of a want of blood in the system.

Treatment.—Give the following powders night and morning in cut feed: Powdered gentian root, three drachms; powdered ginger root, three drachms; mix, and make one dose. If these powders improve the animal in a week or so, give two drachms of the sulphate of iron in addition thereto. The iron, however, may dry up the milk considerably. The case then resolves itself into whether it would be better to have a dead cow or a dry one.

Aphtha or Thrush.—This is an eruption in the mouth similar to small bladders, and is often mistaken for a contagious disease called Epizootic Aphtha.

Cause.—Irritation in the mouth of young cattle from teeth.

Treatment.—If treatment be at all necessary; a weak mixture of vinegar and cold water will answer; or a solution of alum or alum water applied to the mouth twice a day, will be all that is wanted.

Black Water—(See Red Water).

Bladder Diseases.—The ox is not free from disease of this organ. Bladder diseases in cattle generally, are the result of irritant matters in the urine, and of calculi or stone in the bladder.

Symptoms.—The animal is restless, having pain and irritation, and constantly endeavouring to make urine, but only a few drops passing at a time. The eyes are blood-shot.

Treatment.—Give at once twenty-five drops of the tincture of aconite root, to relieve irritation and pain. Give freely linseed tea to soothe the kidneys and bladder. In order that any earthy matter which may be present in the *uretus*, kidneys or bladder may be lessened or destroyed altogether, give sixty drops of muriatic acid once or twice a day in cold water. This, however, should not be given whilst there is pain or irritation present.

Bladder, Prolapsus of the.—Among cows, during and after difficult calving, there will sometimes be observed a white, shining, watery bag protruding between the lips of the vulva. This is the bladder holding the urine. It is twisted at its neck, and, therefore, cannot be emptied. Many a good cow has been destroyed by ignorant persons mistaking this for some of

the watery membranes surrounding the calf, and, therefore, *intentionally* tearing it asunder.

Treatment.—Carefully examine the distended bag, its shape and size. Having determined that it is the urinary bladder, carefully cleanse it, if dirty, and pass the hand previously oiled along its surface, ascertaining which way the turn or twist is made. Having satisfactorily known this, take the bladder by the other hand and reverse the turn or twist, then carefully push the bladder back into its place.

Brain Diseases—Phrenitis—An inflammation which is the same as mad staggers in the horse. It is due to overfeeding on long, wet grass or clover, and distention of the stomach. In rare instances it is caused by the deposit of a wax-like matter within the ear that communicates with the brain.

Symptoms—The animal is dull during congestion. This is succeeded by quickened breathing, excitement and delirium, the eyes being bloodshot. It is the picture of disease and suffering, and if not soon relieved, falls and remains in a state of stupor from which it never recovers.

Treatment—In the early stages of this disease, much can be done by an active cathartic or purge, composed of one pound of epsom salts, and one pound of table salt, dissolved in four quarts of cold water and sweetened with molasses. Apply cold water to the forehead, warm water bandages to legs, and tightly clothe the body. Inflammation of the brain is often seen in the fatal form of milk fever in cows.

Bronchitis.—Cause.—This is inflammation of the windpipe and is a disease which rarely attacks one animal, but usually the most of the herd will be attacked before it leaves the place, and then it will leave when there are no more victims to seize. These epizootic diseases depend upon what is called atmospheric causes. Such condition usually manifests itself in the spring of the year, and sometimes early in the summer. The peculiarity of the air causes irritation of the mouth, throat or wind-pipe, and, sometimes extends to the chest and lungs themselves.

Symptoms.—In a week or so after the attack, a slight husky cough, with weeping from the eyes, labored breathing, and a watery discharge from the inner corner of the nose, will be seen; and by applying the ear to the course of the wind-pipe, a slight, rough and grating sound will be heard.

Treatment.—If the disease be discovered within forty-eight hours from the attack, take from four to five doses of the tincture of aconite root, twenty-five drops to a dose, and give one dose every four hours. If there be uncertainty as to whether the disease has existed longer or shorter, to save time, the aconite may be given along with the following powders, three times in the day: Powdered sulphate of iron, three drachms; powdered gentian

root, half an ounce; powdered ginger root, half an ounce; powdered sulphite of soda, half an ounce; mix, and make a drench, to be poured down the mouth out of a strong bottle. The medicine is to be continued (omitting the aconite after the fifth dose) till the animal is well, or looks brighter, and eats all it gets. If it be a milch cow, the usual quantity of milk will be given. In addition to the above medicines, give, once or twice daily, half an ounce of commercial sulphuric acid, largely diluted or mixed in half a bucket of cold water. In feeding, care should be taken not to give too much, so as to bring on dangerous indigestion. Cold water and pure air are indispensable agents in the treatment of this andalldiseases of horses and cattle.

Bull Burnt.—This is a disease similar to gonorrhœa in man. Of all the domestic animals, the ox tribe are the only ones which are subject to this disease, more common in hot than in cold weather.

Symptoms.—In urinating there is uneasiness, and the urine is passed in small quantities; slight mucous discharges from the organ of generation. In the bull, there is at times no desire for copulation, even when it is desirable that there should be. This often leads to the discovery of the cause.

Treatment.—Separate the bulls from the cows, and dose the affected ones, including the bull, with a purgative of epsom and common salts. Give one pound each, mixed or dissolved in four quarts of cold water, sweetened with molasses, and add a little ginger—say a quarter of an ounce. Be assured that both bull and cows are thoroughly cured before the bull is admitted among the cows, for a second attack on the bull will render him useless.

Calving.—This is an operation of nature, which most dairymen and farmers are familiar with, and upon which it is not necessary to dilate.

If any complications in calving arise beyond what an ordinary experienced farmer feels himself able to cope with, he should secure the assistance of a competent veterinarian, as any mistakes made is liable to lead to fatal results.

Retention of the After Birth.—If the cow has gone her full time with calf, and is in a healthy condition, the after-birth will not be retained long after she has given birth to her calf. When a cow does not cleanse properly, and within a reasonable time, there is then something otherwise wrong with her health, such as debility and want of vitality in the system. It is this that must be looked to, and not the want of timely cleansing that demands attention, as the cause of the cow not doing well after calving. Remedy these existing causes, and the cow will cleanse properly enough. Contrary to the generally received opinion of farmers and others, the retention of the after-birth for a day or two will do no harm, provided that decomposition does not take place with the after-birth; for in such cases, the whole system of the cow is apt to be contaminated and poisoned.

Treatment.—Cows not having cleansed properly within twenty-four hours after calving, should be given the following mixture: Epsom salts, one pound; powdered ginger, one ounce; caraway seeds, half an ounce; mix, and give in three or four bottles of warm ale, porter, or warm water, sweetened with molasses. This mixture not having the desired effect in twelve hours, the hand, well greased, should be introduced, and the after-birth at the attachments, called cotyledons, gently pressed. This must not be accompanied with much pulling, as pressure with the finger and thumb will be all that is wanted. This operation may be followed by giving the cow a little warm ale or molasses water, with half an ounce of powdered ergot of rye; and in half an hour an additional half ounce. This will cause contraction of the womb, and expulsion of the placenta. When decomposition or putrefaction of the after-birth has taken place, which is known by the black color, the womb should be well washed out by a weak solution of chloride of lime. Administer, also, by the mouth, one ounce, three times in the day, of sulphite of soda for a week, to neutralize any of the poison of putrefaction, that may have been absorbed into the blood. Give the cow good and nutritious feed to support her strength.

Symptoms of Blood Poison.—The absorption of putrid matter into the blood is immediately followed by fever, of a low type, called typhoid, and if not speedily checked will be succeeded by typhus, from which the animal cannot recover.

Treatment.—Give the sulphite of soda in the manner spoken of above, combined with two drachms of the sulphate of iron, and one ounce each of powdered ginger and fœnugreek three times in the day, till the beast is bright, lively and free from stupidity.

Catarrh.—This is not a disease common to the ox, for when causes arise sufficient to produce catarrh or cold in the cow, it does not run its course as such, but is speedily accompanied, or at least followed by severe complications. Cattle not exceeding two years old are subject to a disease somewhat similar to cold, called hoose. (See Bronchitis and Hoose.)

Chicken Pox.—*Varicella Boum.*—A pustular eruption on the teats of cows. The eruptions soon discharge, dry up, and heal, without any treatment whatever having been applied to them.

Choking.—This is of frequent occurrence among cattle or cows fed upon potatoes, turnips, etc.

Treatment—When the obstruction is lodged in the upper or middle third of the gullet, the mouth of the animal is to be held open by means of a balling iron, or some other contrivance. If the substance be low down in the gullet manipulations may be tried from outside, by tightening the skin upon the obstruction, and trying to move it up if possible; but downwards, it if will go

without too great force being used. Failing to remove it either up or down, try to dislodge it by pouring small quantities of oil or melted lard, not hot, down the throat. If this also prove ineffectual, a strong flexible cane may be tried; but care should be taken to have the cane go down the right passge. If coughing is set up on the introduction of the cane, have it withdrawn as it has entered the air passages, but try till it has been properly entered down to the obstruction. With patience and perseverance this difficulty will usually be overcome. Still, however, there are cases which require the gullet to be opened over the place of obstruction; a safe operation requiring only a simple cut through the skin and outer surface of the gullet, which will readily heal without much trouble, by bringing the lips of the wound together, with a stitch or two of strong, but small twine or saddler's silk, by means of a small packing needle. Feed the cow or ox, for a week or more, upon soft or prepared food till the wound is healed. When cows or oxen remain long in a choked condition, the throat is apt to swell from the accumulation of gas in the first stomach, which will have to be treated as for hoven or tympanitis—occurring usually from eating clover or rank and wet grass. (See Hoven.)

Colic.—Colic in cattle is more rarely seen than in the horse, but occurs in the form of hoven, (which see).

Consumption.—This disease is not so common in domestic animals as in the human family, nor is it as frequent in any of the animals as it is in the milch cow. Consumption in cows is usually exhibited in the tubercular form. These tubercles are from the size of a pin head to that of a hickory nut, flattened, oval and round.

Symptoms.—Thin of flesh, unthrifty; a staring coat of hair, long and dead-looking; a low husky cough, loss of appetite, weakness, and a bloodless condition of the whole system, which is readily known by the pale white lining of the eyes, nose, and mouth. The consumptive cow stands with her back arched, and her fore legs turned out at the elbows, and when lying rests on the belly and breast bone. The milk of such cows is thin, blue, and watery.

No treatment will be of much service, it is therefore advisable if the animal is not too low in flesh to slaughter it at once.

Cow-pox.—This is a simple affection of the skin of the udder, which has claimed much notice on account of the valuable benefit conferred by it upon the human family, in furnishing the material for the *vaccination* of children.

Symptoms.—Teats painful, slightly swollen, a faint blush upon the udder; and in about three or four days, red hard spots are seen, succeeded by

red patches, which, in from a few days to a week, forms bladders containing the true vaccine lymph.

Treatment.—Foment the teats with warm water and castile soap, after which wipe the bag dry and dress with citrine ointment or a preparation of iodine.

Cud, Loss of the.—This occurrence is the symptom of, and not a disease. Loss of the cud, or rumination, accompanies almost every disease of any importance attacking the ox or cow. When rumination has ceased for a time, and is resumed again, it is a good symptom that the animal is somewhat better, and an indication that the functions of the body are about being resumed again, and are demanding food for their nourishment. Loss of cud is among the first symptoms observed by farmers in case of bronchitis, pleuro-pneumonia, hoven, aphtha, etc.

Diarrhœa in Calves.—This is a frequent affection among young calves, and destroys thousands of them every year.

Cause.—Depending upon the character of the milk; not so much its quality as the time and manner of giving it. Thus, calves are not allowed to suck their own mothers; frequently they are not allowed to suck at all, but have to drink milk out of a bucket, and then it is often cold before they are allowed to have it. The rapidity with which they drink their allowance, which is often too much for them, gorges the stomach and paralyzes the digestive functions. Hence, the *white* diarrhœa so often seen among young calves.

Symptoms.—The symptoms one would think alike in all animals; but this is not the case here, or so far as the diarrhœa of calves is concerned. They have a voracious appetite, swelling of the belly with occasional pain, discharges of wind or gas, and white or yellowish-colored excrement or dung, while in some bad cases the true milk is passed unchanged by the action of either stomach or bowels.

Prevention.—This is better than cure, and consists in allowing the calf, until several weeks old, to suck its own mother, not only morning and night, but at least three times in the day, dividing the periods as evenly as possible. Thus, by allowing calves to suck the milk for themselves, paralyzation and gorging the stomach with cold milk is avoided, and thereby white diarrhœa prevented.

Treatment.—Give three drachms of carbonate of soda in well boiled wheat flour gruel once a day. If this is not convenient, give a tablespoonful of common rennet after each feed of milk the calf takes; this will materially aid proper digestion by its power in decomposing the milk and fitting it for assimilation.

Diarrhœa.—Cattle are frequently subject to this disease, particularly in the spring of the year when the grass is young and soft. Occasionally it

assumes a very obstinate form in consequence of the very imperfect secretion of gastric juice; the discharges are thin, watery, and fetid, followed by very great prostration of the animal.

The symptoms of diarrhœa are too well known to require any detailed description.

Treatment.—If in a mild form, the diet should be low. In a more obstinate form, give two drachms of carbonate of soda in the food, and one of the following powders, twice a day, will be found very advantageous: opium, one drachm; ginger, half an ounce; prepared chalk, two ounces; to be mixed and given in the form of a drench with wheat flour gruel.

Dysentery.—Youatt says: "It is, however, with dysentery that the practitioneer is most loth to cope,—a disease that betrays thousands of cattle. This, also, may be either acute or chronic. Its causes are too often buried in obscurity, and its premonitory symptoms are disregarded or unknown. There appears to be a strong disposition in cattle to take on this disease. It seems to be the winding-up of many serious complaints, and the foundation of it is sometimes laid by those that appear to be of the most trifling nature. It is that in cattle which glanders and farcy are in the horse,—the breaking up of the constitution.

How often does the farmer observe that no sooner does a milch cow cease her usual supply of milk than she begins to purge! There may not appear to be any thing else the matrer with her; but she purges, and, in the majority of cases, that purging is fatal.

"It may, sometimes, however, be traced to sufficient causes, exclusive of previous disease. Unwholesome food—exposure to cold—neglect at the time of calving—low and marshy situations—the feeding in meadows that have been flooded, where it is peculiarly fatal—the continuation of unusually sultry weather—overwork, and all the causes of acute dysentry, may produce that of a chronic nature; an acute dysentry—neglected, or badly, or even most skillfully treated—may degenerate into an incurable chronic affection. Half starve a cow, or overfeed her, milk her to exhaustion, or dry her milk too rapidly—and dysentry may follow.

"The following will, probably, be the order of the symptoms, if they are carefully observed: There will be a little dullness or anxiety of countenance, the muzzle becoming short or contracted; a slight shrinking when the loins are pressed upon; the skin a little harsh and dry; the hair a little rough; there will be a slight degree of uneasiness and shivering that scarcely attracts attention; then—except it be the degeneracy of acute into chronic dysentery—constipation my be perceived. It will be to a certain extent, obstinate; the excrement will be voided with pain; it will be dry, hard, and expelled in small quantities. In other cases, perhaps, purging will be present from the beginning; the animal will be tormented with a frequent desire to

void its excrement, and that act attended by straining and pain, by soreness about the *anus*, and protrusion of the *rectum*, and sometimes by severe colicky spasms. In many cases, however, and in those of a chronic form, few of these distressing symptoms are observed, even at the commencement of the disease; but the animal voids oftener than it is natural that she should, and they are more fluid than in a state of health; while at the same time she loses her appetite and spirits and condition, and is evidently wasting away."

Treatment.—Give one drachm of the extract of belladonna, three times a day, dissolved in water; or calomel and powdered opium, of each one drachm three times daily. As soon as the inflammatory stage passes by, give one of the following three times daily, in their gruel: nitrate of potash pulverized, gentian-root pulverized, of each one ounce; pulverized Jamaica ginger, one half an ounce; pulverized caraway, or anise-seed, six drachms. A bottle of porter given once a day, will be found of very great advantage.

Epizootic Aphtha.—Murrain. This is one of the most malignant diseases to which cattle are liable. Fortunately, however, true murrain is comparatively rare in this country.

The entire system seems to partake of the disease. The first indication of its approach is a feverish condition of the system, attended with a frequent and painful cough; the pulse is small, hard, and rapid. As the disease advances, the respiration becomes disturbed; the flanks heave; vesicular eruption is observed upon the teats, mouth, and feet; the horns are cold; the animal is sometimes lame; constipation and, sometimes, diarrhœa are accompanying symptoms; dung, black and fetid; the eyes weep and become much swollen; a brown or bloody discharge from the nose and mouth; the animal moans, grinds its teeth, rarely lies down, but to get up again quickly; finally, the breath becomes very offensive; tumors make their appearance in various parts of the body, which, in favorable cases, suppurate, and discharge a fetid matter.

Treatment.—Give one-fourth of a pound of epsom-salts, with one drachm of Jamaica ginger, twice a day, for two or three days. Very little medicine is required internally in this disease, but much depends upon good nursing. External applications are chiefly to be depended upon. A solution of chloride of lime should be applied to the eruptions, or a solution of the chloride of zinc, twenty grains to an ounce of water; or, of sulphate of zinc, two drachms to a pint of water; or pulverized charcoal applied to the parts will be found useful.

Fardel Bound—This is a disease affecting the *omasum*, or third stomach of the cow or ox. (See Impaction, and Hoven.

Fever.—Cows are subject to *ephemeral* fever, or more plainly speaking,

a fever of a day's duration, which passes off without any trouble. This fever has been thought, by some persons, to depend upon hollow horn and wolf in the tail, and they have consequently cut the tail, and bored the horns of the poor dumb brute.

Foul Claw.—Foul in the foot. That is a sore between the digital spaces, and is caused by the animal standing in mud and moisture, which scalds the parts, and produces lameness.

Treatment.—Cleanse out, and apply sulphate of zinc, one drachm; water, half a pint. Keep the feet dry and clean, which will not only assist the cure, but is a preventative also, or what is equally effectual, insert between the claws a bit of tow saturated with tar and sulphate of copper, one application is generally enough.

Garget Mammitis.—Inflammation of the udder in cows is often of a very troublesome character. It occurs shortly after calving, and in some instances not for a week or two after. The inflammation is usually confined to one quarter of the udder only, and may be of an acute, or chronic character.

Cause—Want of proper attention in not milking the cow sufficiently after calving, and in many cases by not milking the cow when her udder is almost ready to burst, even before calving. In a word, if the udder, teats and milk ducts are kept from over-gorgement, there can be no udder disease. The trouble is, that all cows are not alike in the production of milk, but unfortunately they receive the same treatment; and hence those cows which are endowed with great milking qualities are usually the victims of garget.

Treatment.—Let the calf suck the dam as speedily as possible, if the hardness is not then removed bathe the udder with warm water, after which wipe it dry and apply to the entire surface melted lard as hot as the animal can bear it. If abscesses form lance them.

Hæmaturia—Blood in the Urine.—This occurrence is not to be confounded with red water. Congealed blood comes when the first flow of water is discharged, and the remainder of the urine is clear.

Cause.—Blows or other injuries over the region of the kidneys, or from eating the leaves or tops of plants having a powerful diuretic effect, such as some of the yews, cedars and spruces. Cows in calf, and mares with foal, will eat what other animals, or what they themselves would not eat when in other condition. (See Red Water.)

Treatment.—Give linseed tea to drink, and slush mashes and plenty of fluid to drink. No medicine will be required.

Hair Balls.—These are very common in cattle, and are introduced by

the animal licking itself, and swallowing the hair. These balls are found after death, and are of various sizes, and thoroughly felted.

Herpes.—(See Mange.)

Hide Bound.—This is not to be taken as a disease, but merely the result of faulty digestion and assimilation.

Treatment.—Give one pound of epsom salts, half an ounce of ginger, and mix in two bottles of cold water, sweetened with molasses. Next day follow with the following powders: Powdered ginger, one ounce; fenugreek, one ounce; caraway seeds, half an ounce; mix, and give in one dose; and one dose may be given daily for a week.

Hoose in Calves.—This is a common disease in breeding districts, and is very fatal in its results, attacking young calves and cattle, till two years old. It is a parasitic disease.

Cause.—The presence of minute worms in the bronchial tubes. These worms are called *filaria bronchi*, and inhabit the windpipe of young cattle, sheep and lambs.

Prevention.—Keep calves, sheep and lambs on dry land, where there is no marsh. wet land or meadow.

Symptoms.—Constant, husky cough; difficulty in breathing; emaciation, and loss of appetite. Thus the disease goes on from bad to worse, until death takes place in from two to three weeks, depending much, however, upon the age of the beast.

Treatment—Linseed oil, two ounces; oil or spirits of turpentine, half an ounce, well mixed with the linseed oil. This dose is for a calf of six months old. It should be repeated every two days. Give the calves good feed. Another form, and a good one, which is generally used in sheep to save expense and trouble, is to get them together, and drive them into a pretty close house or shed, not larger than will hold all the affected ones. Then procure an earthern bowl or basin, containing one ounce each of common salt and oxide of manganese, and pour over this a mixture, say, water, half an ounce; sulphuric acid, one ounce and a half; stir with a stick, and chlorine gas will be evolved. When sufficiently stirred, leave the place, and close the door. Repeat the inhalation for two or three times, and let two days pass before each subsequent inhalation. If the animal be much weakened by the parasites, mix caraway and fenugreek in their feed, of each a quarter of an ounce, once a day, for a week or so.

Hoven.—*Tympanitis or Drum-Belly.* So called from the appearance and sound. The evolution, or giving off of carbonic acid gas, from the large quantity of grass or clover when wet, contained within the rumen or paunch, together with the suspension of the function of digestion, all of which com-

bined, go to make up the disease called hoven. Hoven may occur in one hour, for we often see cows turned out to pasture in the morning, and are almost found suffocated in an hour afterward. In cases of this kind there is obviously no time to be lost. Every farmer should be prepared to meet and cure them as they occur, there being no time to run for assistance.

Cause.—Over filling the paunch, and in too quick a time—before the stomach has time to act upon it; hence fermentation is set up.

Symptoms.—Great distress; the sides are distended, and when struck, sound like a drum, the beast lying and rising; the breathing is hurried; there is great suffering, and if not speedily relieved, the rumen will give way, burst or rupture; if this does not happen shortly, the brain becomes affected, and the beast dies unconscious. The disease runs its course with great rapidity.

Treatment.—Drench the animal with from one to two ounces of spirits of turpentine in a pint of raw linseed oil, or if no oil on hand use it in one quart of water to neutralize the gas, or two ounces of common table salt dissolved in one quart of water will be found very effective. If those do not give speedy relief give an active purging medicine, about a pound of epsom salts, and freely use injections of soap and water. If the case still remains obstinate, the paunch should be punctured. In the absence of a proper instrument an ordinary pocket knife may be used, taking care not to make too large an opening. The proper point to operate is midway between the last rib and the prominent point of the hip bone, about twelve inches from the centre of the back or loins. Very few cases terminate fatally where this is properly done.

Hydatis in the Brain.—This is a parasitic disease, worms in the brain, and under or near the base of the horn.

Symptoms.—The great symptom chiefly to be relied upon, is the constant turning of the animal in the form of a circle, loss of appetite, horns and ears hot. No kind of treatment is likely to prove effectual in this disease.

Impaction of the Omasum, or Third Stomach.—In some parts of the world this disease is called a "wood evil." So called because the stomach is filled with leaves, dried bramble and sticks or twigs, from bushes. These articles being deficient in nutritive matter, cause the suspension of rumination (chewing the cud,) and digestion.

Causes.—In addition to the causes above given, we may add that of dried grass, which has been left standing in the field; or in fact any kind of food, which does not contain essential principles for fat and blood making, in proportion to its bulk, is sure to bring on an attack of wood evil or impaction of the third stomach.

Symptoms.—Loss of cud, loss of appetite, and quickened breathing, accompanied with a grunt. Diarrhœa is followed by constipation, great thirst;

the legs, horns and ears are cold; grinding of the teeth, and when the disease has about run its course, *moaning* takes the place of the *grunt*, diarrhœa succeeds costiveness, and the poor beast dies exhausted. Examinations after death disclose a curious condition, namely: the third stomach is perfectly *stuffed* full with food, hard and dry.

Treatment.—Allow the animal plenty of cold water to drink, so that the mechanical effects thereof may be advantageous in assisting to wash, dilute and moisten the dry mass. Give strong purgatives. Take epsom salts, one pound; table salt, half a pound; oil of croton, fifteen drops; mix, and give in one dose, in fully a gallon of water; for be it remembered that cattle should have all medicines given in large fluids, and it is more imperatively demandsd in cases like this, where so much depends upon fluids. If twenty-four hours pass by without any effect from the salts, repeat the dose with an addition of [illegible] ounces of the spirits of turpentine. With this dose the purgative medicine should be stopped, whether it has had any effect or not. So long as the animal does not seem stupid or the brain be not affected, there are still hopes that recovery may reward our labors.

Jaundice.—Or Yellows. This is a common disease, from the fact that the ox is supplied with a gall bladder, and gall in great quantity. The stall fed animal is the most subject to it.

Causes.—Closure of the biliary ducts in the liver, and the consequent absorption of the bile into the stomach. The bile duct may be closed from gall-stones.

Symptoms.—In white-skinned oxen, Jaundice is seen at once from their yellow color. In dark-colored animals we are satisfied to examine the lining of the mouth, nose and eyes, for this yellow appearance. In addition to these signs, we have dullness and costiveness, while the dung is of a whitish or straw-colored look.

Treatment.—If the symptoms be not very prominent, the animal may be left with safety to the powers of nature, which can be assisted by giving slop food, or placing it upon bare pasture for a few days. If the case be more of an acute kind, give a dose of purgative medicine, as follows: Epsom salts, one pound; table salt, half a pound; ginger, half an ounce; mix, and dissolve in three quarts of water, sweetened with molasses.

Kidney Disease.—Kidney disease in the ox is of a rare occurrence. Disease of the kidneys is more peculiar to animals, whose lives are allowed to run longer than those of oxen, especially when fat and fit for market.

Laryngitis.—(See Bronchitis.)

Lice.—(See Mange.)

Liver Disease.—(See Jaundice.)

Locked-jaw.—Kill the beast and dress it for market as soon as it is known that it is locked-jawed.

Lung Disease.—(See Pleuro-pneumonia.)

Lymphangitis.—An affection of the ox tribe, following an accident, which partakes of some of the characteristics attending farcy in horses, but without any specific poison being developed.

Treatment.—A dose of salts internally, and fomentations or poultices. Apply to the swelling and to the sores, if there be any, which will depend upon whether the skin gives way or not.

Mange.—Mange, or leprosy, is one of the most unpleasant and difficult diseases to manage of all the ailments to which cattle are subject, requiring the nicest care and attention to render it easy to cure. The great trouble in treating this disease springs from its contagious character; for no sooner is the animal, oftentimes, once free from the *acari*, than it comes in contact with some object against which it has previously been rubbing, when the *acari* which were left upon the object are again brought in contact with the animal, and the disease is reproduced. If, immediately after the proper applications are made, the animal is removed to other quarters, and not allowed to return to the former ones for six or eight weeks, there is generally speaking, but little trouble in treating the disease.

Treatment.—Take the animal upon a warm, sunny day, and with a scrubbing-brush cleanse the skin thoroughly with Castile-soap and water; when dry, apply in the same manner the following mixture; white hellebore, one ounce; flower of sulphur, three ounces; water, one quart; mix all well together. One or two applications are, generally, all that will be required. give internally one of the following powders in the feed, night and morning for a few days; flowers of sulphur, two ounces; black antimony, one ounce; nitrate of potash, one ounce, mix, and divide into eight powders.

Milk Fever.—Milk fever occurs from the first to the third day after calving; rarely after the third day. It is seldom met with before the fourth calving, then attacking chiefly cows of select breeds, and good milkers. Milk fever consists in inflammation of the womb, which sometimes even extends to the bowels.

Symptoms.—Loss of appetite; chewing the cud, or rumination ceases; staggering gait, wild look, falls and cannot rise. If the disease be not checked the brain will soon be affected also, when the cow will dash about with her head and horns, plunging them into the ground.

Cause. Undue determination of the blood to the womb from over feeding before, and immediately after calving, and from sudden changes of the weather at the time of calving.

Prevention.—Give, one week before calving, one pound of epsom salts,

half a pound of table salt, and half an ounce of ground ginger, mixed in three quarts of cold water, sweetened with molasses. Let the cow's feed be of the lightest kind, such as hay and thin slop mashes, and no meal, grain or solid food. This measure will lessen the tendency to interruption of the circulation, and will improve the health and tone of the whole system. To avoid, as much as possible, the effects of sudden changes of the weather, have the cow brought into the stable. When milk fever is anticipated, give, a few hours after calving, about twenty drops of the tincture of aconite root, which may be repeated every six hours, till four doses have been given. Nothing is more capable of equalizing the circulation of the blood by controlling the heart's action, and thereby the circulation, than aconite; and for this purpose it is most valuable to the farmers and breeders of stock throughout the country. The foregoing measures, together with light slop feeding for a few days after calving, will prevent much suffering to the cow, and inconvenience and loss to the owner.

Treatment.—When the disease is present, give at once twenty drops of the tincture of aconite root, and half an ounce of the pure opium in powder, in a bottle of pure gruel. The aconite must be repeated every four hours without the opium, until four or five doses are given. Place chopped ice in a bag, or cold water cloths on the forehead, attaching it then to the horns, renewing when wanted. This being done quickly, at more leisure get epsom salts, one pound; table salt, one pound; ginger, half an ounce; mix and dissolve in three quarts of cold water, with a little molasses to sweeten it, and give at one dose. After this medicine has been given, turn the cow from side to side every four hours, or when the aconite is given, which will save labor and unnecessary excitement to her. She should be left as quiet as possible, and her legs and body be kept warm, thereby relieving the womb to that extent. Do not deny pure air, nor plenty of cold water to the afflicted animal, for she not only needs them, but they are indispensible to a sure and perfect recovery in most diseases, and as much so if not more in a disease of this kind.

Mouth Disease.—(See Epizootic Aphtha.)

Nephritis.—This is a name given to a disease, or inflammation, of the kidneys. It is scarcely ever seen in the ox.

Ovarian Dropsey.—This is a disease peculiar to milch cows, and consists of watery swellings of the ovary, but one ovary being usually affected. Ovarian dropsy is characterized by a large, soft swelling, situated upon the side of the cow, between the short rib and the thigh.

Treatment.—Tap the tumor with an instrument called a trocar, or a pocket-knife, whereby the fluid is let out. When this is done, feed the cow well, and give her iron, gentian and ginger, to prevent further accumulation.

Ovarian Tumor.—The difference between ovarian dropsy and ovarian tumor, as ascertained by the touch, is, the dropsy is soft and fluctuating, and the tumor hard and slightly movable.

Treatment.—Fatten the animal, and kill and send her to market, before she dies and becomes a complete loss.

Parasitic Lung Disease.—(See Hoose.)

Parturient Fever.—(See Milk Fever.)

Pleurisy.—This is inflammation of the pleuro, or white, fibrous, serous tissue lining the ribs within the chest, and the covering of the lungs. For further particulars, see the following article.

Pleuro-Pneumonia.—Pleuro-Pneumonia signifies inflammation of the lungs and pleura, and merely indicates that both lung and pleura are diseased; the disease probably commences in the lungs and finally involves the pleura so that the disease in its compound form, may be considered as an aggravated form of inflammation of the lungs, the terminations of which are, altered structure, and hydrothorax, hence it differs from the disease termed *epizootic-Pleuro-Pneumonia*, from the fact that it is not infectious nor contagious, but sometimes endemic. The treatment of this compound disease, if it can be so called, must be nearly the same as that recommended for acute inflammation of the lungs, with the addition of "broken doses of nitrate of potash in water."

Epizootic Pleuro-Pneumonia.—This disease, which has at certain periods prevailed so alarmingly in the old worlds, is of rather rare occurence in Canada. In view of furnishing the reader with *reliable* matter on the subject now under consideration, a selection from the pen of the celebrated Findley Dun, V.S., "A prize essay" is offered.

"The causes of the disease, both immediate and remote, are subjects full of interest and importance; and a knowledge of them not only aids in the prevention of disease, but also leads the practical man to form a more correct diagnosis, and to pursue the most approved course of treatment. It is, however, unfortunate that the causes of pleuro-pneumonia have not as yet been satisfactorily explained. No department of the history of the disease is less understood, or more involved in doubt and obscurity. But in this respect pleuro-pneumonia is not peculiar: it is but one of an extensive class which embraces most epidemic and epizootic diseases. And if the causes which produce influenza, fevers, and cholera, were clearly explained, those which produce pleuro-pneumonia would, in all probability be easy of solution.

"Viewing the widespread and similar effects of pleuro-pneumonia we may surmise that they are referable to some common cause. And although much difference of opinion exists upon this subject, it cannot be denied that

contagion is a most active cause in the diffusion of the disease. Indeed, a due consideration of the history and spread of pleuro-pneumonia over all parts of the land will be sufficient to show that in certain stages of the disease, it possesses the power of infecting animals apparently in a sound and healthy condition, and otherwise unexposed to the action of any exciting cause. The peculiarity of the progress of this disease, from the time that it first appeared in England, is of itself no small evidence of its contagious nature. Its slow and gradual progress is eminently characteristic of diffusion by contagion; and not only were the earlier cases which occurred in this island distinctly proved to have arisen from contact with the Irish droves, but also subsequent cases, even up to the present day, show numerous examples in which contagion is clearly and unequivocally traceable.....

Although pleuro-pneumonia is not produced by the action of any one of these circumstances alone [referring to the noxious effluvia, etc.], yet many of them must be considered as predisposing to the disease; and although not its immediate exciting causes, yet, by depressing the physical powers, they render the system more liable to disease, and less able to withstand its assaults. Deficient ventilation, filth, insufficient and bad food, may indeed predispose to the disease, concentrate the animal effluvia, and become the medium of the organic poison; but still, not one, alone, of these circumstances, or even all of them combined, can produce the disease in question. There must be the subtle poison to call them into operation, the specific influence to generate the disease.

"On the other hand, it appears probable that the exciting cause, whether it be contagion, or whatever else, cannot, of itself, generate the disease; but that certain conditions or predisposing causes are necessary to its existence, and without which its specific effects cannot be produced. But although these *remote* or *predisposing* causes are very numerous, they are often difficult of detection; nay, it is sometimes impossible to tell to what the disease is referable, or upon what weak point the exciting cause has fixed itself. A source of perplexity results from the fact..... The predisposing causes of disease admit of many divisions and subdivisions; they may, however, be considered under two general heads—*hereditary* and *acquired*.

"With reference to the former, we know that the good points and properties of an animal are transmitted from one generation to another; so also are faults, and the tendencies to particular diseases. As in the same families there is a similarity of external form, so there is an internal likeness, which accounts for the common nature of their constitution, modified, however, by difference of age, sex, etc.

"Among the acquired predisposing causes of pleuro-pneumonia may be enumerated general debility, local weakness, resulting from previous disease, irritants and stimulants, exposure to cold, damp, or sudden changes of tem-

perature, the want of cleanliness, the breathing of an atmosphere vitiated by the decomposition of animal or vegetable matters, or laden with any other impurity. In short, under this head may be included every thing which tends to lower the health and vigor of the system, and consequently to increase the susceptibility to disease.

"The primary symptoms of pleuro-pneumonia are generally obscure, and too often excite but little attention or anxiety. As the disease steals on, the animal becomes dull and dejected, and, if in the field, separates itself from its fellows. It becomes uneasy, ceases to ruminate, and the respirations are a little hurried. If it be a milch cow, the flow of milk is diminished, and the udder is hot and tender. The eyes are dull, the head is lowered, the nose protruded, and the nostrils expanded. The urine generally becomes scanty and high-colored. It is seldom thought that much is the matter with the animal until it ceases to eat; but this criterion does not hold good in most cases of the disease, for the animal at the outset still takes its food, and continues to do so until the blood becomes impoverished and poisoned; it is then that the system becomes deranged, the digestive process impaired, and fever established. The skin adheres to the ribs, and there is tenderness along the spine. Manipulation of the wind pipe, and percussion applied to the sides, causes the animal to evince pain. Although the beast may have been ill only three days, the number of pulsations are generally about seventy per minute; but they are sometimes eighty and even more. In the first stage, the artery under the jaw feels full and large; but as the disease runs on, the pulse rapidly becomes smaller, quicker and more oppressed. The breathing is labored, and goes on accelerating as the local inflammation increases. The fore extremities are planted wide apart, with the elbows turned out in order to arch the ribs, and form fixed points for the action of those muscles which the animal brings into operation to assist the respiratory process. In pleuro-pneumonia, the hot stage of fever is never of long duration [*simply because there is not enough vitality in the system to keep up a continued fever*]. The state of collapse quickly ensues, when the surface heat again decreases, and the pulse becomes small and less distinct. We have now that low typhoid fever, so much to be dreaded, and which characterizes the disease in common with epizootics,

". . . The horse laboring under pleuro-pneumonia, or, indeed, any pulmonory disease will not lie down; but, in the same circumstances, cattle do so as readily as in health. They do not, however, lie upon their side, but couch upon the sternum, which is broad and flat, and covered by a quantity of fibro-cellular substance, which serves as a cushion, while the articulation between the lower extremeties of the ribs admits of lateral expansion of the chest. In this position cattle generally lie towards the side principally affected, thus relieving the sounder side, and enabling it to act more freely. There is sometimes a shivering and general tremor, which may exist through-

out the whole course of the disease. (This is owing to loss of equilibrium between the nerves of nutrition and the circulation.) . . . As the case advances in severity, and runs on to an unfavorable termination, the pulse loses its strength and becomes quicker. Respiration is in most cases attended by a grunt at the commencement of expiration—a symptom, however, not observable in the horse. The expired air is cold, and of a noxious odor. The animal crouches. There is sometimes an apparent knuckling over at the fetlocks, caused by pain in the joints. The animal grinds its teeth. The appetite has now entirely failed, and the emaciation becomes extreme. The muscles, especially those employed in respiration, become wasted; the belly is tucked, and the flanks heave; the oppressive uneasiness is excessive; the strength fails, under the convulsive efforts attendant upon respiration, and the poor animal dies.

"In using means to prevent the occurrence of the disease, we should endeavor to maintain in a sound and healthy tone the physical powers of the stock, and to avoid whatever tends to depress the vital force. Exposure to the influence of contagion (and infection) must be guarded against, and, on the appearance of the disease, every precaution must be used to prevent the healthy having communication with the sick. By a steady pursuance, on the part of the stock proprietor, of these precautionary measures, and by the exercise of care, prudence and attention, the virulence of the disease will, we are sure, be much abated, and its progress checked."

As the reader could not be benefited by our detailing the system of medication pursued in England,—at least we should judge not, when we take into consideration the great loss that attends their *best efforts*,—we shall therefore proceed to inform the reader how the disease should be treated in this country

If a "sound and healthy tone of the physical powers of neat stock," is the best preventivive against this formidable malady, it follows, that a course of medication and management, calculated to restore the lost healthy tone, is the most rational. In the first place the patient should be removed from its associates, into a loose barn or shed; the diet must be light and nutritious; should, however, the animal be plethoric, the attendant would of course dip a lighter hand into the meal-bag. The general indication of cure are as follows: Restore the suppressed evacuation, secretions, and excretions; provided either are interrupted, and relieve all urgent symptoms.

In view of fulfilling the above indications the following recipe is submitted:—

Glycerine,	1 ounce.
Iodide of Potassium,	5 drachms.
Tincture of Lobelia,	1 ounce.
Podophylium,	1 drachm.
Water	6 ounces.

Mix, and give one-sixth of this quantity morning and evening. Should the

action of the intestines appear to be tardy or inefficient, a relaxing and stimulating injection may be administered in the following proportions :—

Pulverized Lobelia seeds	1 ounce.
Pulverized Ginger	4 drachms.
Warm Water	2 quarts.

Mix, and inject.

It is a woeful error to resort to blood-letting in this malady, for in the first place all epizootic diseases are of a very prostrating character, and in a brief space of time generally commit the most fearful ravages, so that all the blood in the economy is needed; some of it goes to repair the mischief occurring in the organs of respiration and elsewhere; and another quantum is needed to carry on the vital operations; in fact there is no blood to spare.

Prurigo Vernalis.—This is a disease peculiar to the Spring of the year, and characterized by extreme itchiness—the body being covered with inflammatory spots, which discharge pus, and forms scabs that fall off and leave the parts bald, or without hair.

Treatment.—Give a dose of epsom salts, and fumigate the beast with sulphurous acid gas. (See Sulphurous Acid Gas, in article on Horse and Cattle Medicines.) Give good feeding and good shelter.

Puerpural Fever.—(See Milk Fever.)

Quarter Evil.—(See Black Leg.)

Red Water.—This is a disease common amongst horned cattle, and consists in the altered condition of the blood. The disease derives its name from the color of the urine passed while suffering from it.

Cause.—Obscure, but assigned to local causes, such as the peculiar properties of certain herbs or grasses which the cow feeds upon; also from eating bad quality of roots, etc.

Symptoms.—General derangement attracts the farmer's attention, and upon observing the urine which the animal has passed, it is seen to be of a red, or reddish brown, or claret color. The color increases in depth; other secretions are checked; the animal becomes hide bound, and the milk dries up. Appetite and rumination are suspended: the pulse becomes feeble and frequent, the extremities cold, indicating the languid state of the blood's circulation and the poverty of the blood itself. Occasionally diarrhœa comes on, lasting for a day or two, followed by constipation.

Treatment.—Give one pint of raw linseed oil, or if this is not handy, give about one pound of epsom and one pound of common salt and half an ounce of ginger, dissolved in three qaurts of water, and give plenty of linseed tea to drink. To hasten recovery, give good and generous feeding, which will also assist in making blood for that which has been lost.

Reticulum.—The second stomach, so-called from *ret*, or net like, and is sometimes called the honeycomb.

Rinderpest.—This is the Dutch name for Cattle Plague. The disease will be found treated of under the article Typhus Contagiosus Boum (contagious typhus of cattle).

Ringworm.—This is a parasitic disease, and consists in the growth of cellular tumors on the skin. Young animals of one and two years are most subject to the attack of the parasites.

Symptoms.—Broad and flattened elevations on the skin.

Treatment.—If left to themselves they will die out in a year. The oxide of zinc ointment will speedily cure the affection. It is considered a contagious disease, although not a fatal one. (See Ointments.)

Rot.—(See Diarrhœa and Consumption.)

Rumen or Paunch.—This is the first stomach, and is the receptacle for all food that is gathered, which is kept there till wanted, or till the rumen is full, when rumination is usually begun by contraction of the rumen upon its contents, whereby portions of the food are forced into the gullet and mouth, to be remasticated and finally passed down the gullet again. It does not, however, pass over the *floor* of the canal this time, but separates the pillars, and goes not into the rumen, but into the third stomach.

Rupture in Calves.—The rupture we are now considering is what is known by the name umbilical, which occurs in young colts and calves, and consists in the protrusion of a portion of the bowel and intestine through the naval, thus forming a small tumor. This condition is often congenital, or found on the calf at birth.

Treatment.—Force the bowel up into the belly, gather the loose skin together, tie a well waxed cord tightly round it close to the belly, and a strong pin may be forced through the skin below the ligature or cord, to keep it from falling off before the loose skin comes away. In a few days the skin will fall off, leaving a healthy sore without any hole or rupture.

Another form of treatment is to place a bandage round the body and a pad over the rupture, as is recommended for the same condition in colts, which see. Whatever the plan that may be adopted for the cure of umbilical in calves, they must be kept separate from one another, as each will *suck* the other, thus preventing closure of the rupture and healing of the parts.

Slinking the Calf.—(See Abortion.)

Sore Throat.—(See Bronchitis.)

Spaying.—This is the name given to an operation for the removal

of the ovaries or female testicles from the milch cow and young female oxen. The object for the removal of the ovaries from young cows that never have had a calf is to prevent them from ever having a desire for the male, so that she will be more easily fattened and fitted for the market.

Splenic Apoplexy.—This is a disease consisting in engorgement of the spleen with blood, and the subsequent rupture of the organ, followed by death in from twelve to twenty-four hours from the time of attack.

Cause.—This disease is clearly traceable to the new, and what is generally called the *improved* feeding and fattening of cattle. Food rich in nutritive qualities, and deficient in fluids, is the great cause of splenic apoplexy in cattle.

Symptoms.—Constitutional disturbance is set up all at once, and no early symptoms manifested. The animal is well to every appearance at one time in the day and dead by evening. When the symptoms are seen, they are as follows: Colicky pains, twitching of the muscles, staggering gait, frothing from the mouth, and the urine colored and mixed with blood. The animal falls and dies, the immediate cause of death being coma, from derangement of the brain.

Treatment.—Treat the case, by way of preventon, with low diet. No treatment, however well directed, is of any use when the disease has once manifested itself. Life is prolonged a few hours by blood-letting, but no cure can be effected.

Spring Eruption.—(See Ringworm.)

Stomach Staggers.—(See Hoven.)

Strangulation.—(See Choking.)

Teats.—Teats of milch cows are often subject to diseases and derangement.

1. Milk stones sometimes stop the flow of milk, and are felt within the milk channel when the teat is pressed between the fingers. For their removal, take a knitting needle, and, if possible, force the obstruction up into the udder.

2. Strictures of the milk channel of the teat cause a small stream of milk to flow, and impair the usefulness of that quarter of the udder. This can also be remedied by using a needle, commencing, however, with a small size and gradually using thicker or larger ones, till the channel is as large as wanted. This operation will have to be carried on for a week or two, the first day using the small probe three times in the day, and following next day with the larger size, and so continuing with other sizes till finally cured.

3. Warts are of occasional trouble to the cow, and to those who milk

her. Irritation and sometimes swelling is induced, which causes closure in the channel of the teat. Warts are to be removed by a pair of sharp scissors.

4. Sore teats are cured by the simple ointment, one ounce, and one drachm of the rust of copper, commonly called verdigris, added to it.

Texan Fever.—Is nothing more than Fardel. The omasum or third stomach, becomes so choked up [illegible] that it is hard and dry, and operation of the digestive organs is thereby seriously impaired. The animal will eat voraciously for a time, but [illegible] suddenly and trembles; there is a wild expression of the eye, and so[illegible] forming at the mouth, and a tendency to pitch forward. Occasionally [illegible] are very active, speedily terminating in death.

Treatment.—Give large doses of epsom salts, dissolved in plenty of water, sweetened with molasses. If no relief follows in twenty-four hours, repeat the dose. The most probable time for this disease to show itself is after a good grass growing spring, succeeded by a dry, hot summer, converting the grass into spindles containing no moisture, and very little nutritive properties.

Throat Diseases.—(See Bronchitis.)

Thrush.—(See Epizootic Aphtha.)

Turbercle Diseases.—(See Consumption and Diarrhœa.)

Tympanitis.—(See Hoven.)

Typhus Contagiosus Boum—Contagious Typhus of Cattle—Rinderpest Cattle Plague, etc.—This is one of those epizootic diseases which have, at distant and different periods of the world's history, attacked the ox tribe of Europe, and consists in inflammation and irritation of the fibrous, serous tissue, or white membranes of the nose, windpipe and chest, and instead of serum or fluid being poured out as a consequence, as is the case in epizootic pleuro-pneumonia, the membranes become deteriorated, portions become detached, and some partially adhere, but all decay, and become a dangerous poison, which is gradually absorbed into the general circulation, speedily followed by fermentation of the blood within the body, resulting in boils, or small carbuncles containing pus, which soon break and discharge. All of this is accompanied by sympathetic fever (typhus so called), gradual and progressive in its character, till the blood and tissue of the body are no longer fit for the purposes of life, and the animal dies an exhausted and miserable object, in from a few days to one, two or three weeks from the time of attack.

Causes.—Certain conditions of the air and earth, as heat and moisture, cold and dryness; contagion. These may be called the exciting causes; something still being wanted in the system of the animal to form the predis-

posing cause—as debility, and a low standard of general health. Indeed, the conditions which sometimes exist in, and form pleuro-pneumonia, are capable of producing contagious typhus. This opinion is borne by Jessen, who among the discordant opinions and theories of Europe, has declared the disease to be associated with pleuro-pneumonia. Dr. Greenhow says that contagious tphus existed side by side with pulmonary disease in England in the middle of the last century.

Symptoms.—The weeping eye, the acrid drop from the inner corner of the nostrils, together with slight rough sounds from the wind pipe, will tell the intelligent observer that something is wrong, and all this can be told from twelve to twenty-four hours from the time of attack. The husky cough, with dullness and prostration, follow the weeping eye and nostril. The back is arched, appetite and rumination irregular, the rigor and the chill tell that blood poison is present, and suppuration is going on as a remedial and natural measure, to get rid of the foreign and poisonous matter in the blood. The breathing soon becomes labored, the heat of the body is variable, while the skin and hair look unhealthy, and fever gets high. If the mouth and nose be examined, eruptions and sores will be seen; and these sometimes extend to the feet. All the foregoing symptoms are now speedily followed by discharges, from the nose and eyes, of pus streaked with blood. Salivation and diarrhœa supervene, together with stupor, and all the phenomena of approaching death. In this disease, as in pleuro pneumonia, cows heavy with calf or otherwise debilitated, die sooner, and do not bear up so well as animals in better condition. The intelligent and careful reader cannot fail to see several prominent and important symptoms common alike to this disease and epizootic pleuro-pneumonia.

Treatment.—The correct method of treatment is apparent from the nature, symptoms and post-mortem, or appearances after death. Appearances all indicate that the animal is affected with fermentation of the blood, consequent upon inflammation and deterioration of the fibrous, serous tissue of the body, accompanied with fever of a typhus type. Then the first thing to be done is, to build up the system and arrest fermentation by elimination or neutralization of the leaven, or ferment. For this purpose then, use the following powder: Powdered carbonate of ammonia, one ounce; powdered sulphate of iron, or copper, three drachms; powdered gentian root, half an ounce; powdered ginger root, half an ounce; mix, and make one dose. Give one dose of this powder morning and night. In the middle of the day give one ounce of sulphite of soda daily. The animal must be fed well and in a generous manner, but by no means to arrest digestion by over feeding.

Udder Diseases.—(See Garget.)

Urine, Bloody.—(See Red Water.)

Vaginal Catarrh.—A disease in old cows a few weeks after calving.

Varicella Boum--(See Chicken Pox.)

Vertigo.—(See Stomach Staggers and Hoven.)

Warbles.—The product of œstrus bovus, or ox fly, from having deposited its ova or egg in the skin. It is a disease peculiar in the summer months, and is characterized by tumors varying in size from a grain of corn to that of a hickory-nut.

Water in the Chest.—(See Pleuro-pneumonia.)

Worms.—(See Hoose.)

Winter Care of Cattle.

This is one of the most important subjects the farmer has to consider, for there are more diseases that show themselves in the spring contracted from injudicious management during the winter months than from any other cause.

A great desideratum in this connection is the employment of good help. In the summer months patience and judgment in feeding are not so essential, as live stock upon grass are self-tenders, and are but little under the hand of the keeper, and the conditions in nearly every way, except in an extremely dry season, are generally favorable to an uninterrupted condition of health in a herd or flock.

Men have their idiosyncrasies and so have cattle, and peculiarities of temper must be born with and seemingly not noticed, for if animals are incapable of reasoning we need not expect them to give up their whims and peculiarities to meet the exactions of an arbitrary and ill-tempered keeper. No man is fit to have the daily turning out and in, the loosening and tieing up, and the feeding and grooming of any description of farm animals, who does not naturally like a domestic beast, and incline instinctively to treat one kindly. The winter season is one of jeopardy to farm animals, whether they be kept within doors or are made to rough it without, and it is a supposable case that the man in charge, under either mode of keep will, now and then, have occasion to draw upon his patience as well as upon that most essential characteristic in the make up of a successful caretaker of animals, namely, a willingness to practice a little self-denial, when the safety or comfort of animals in his charge requires it. A night watch who sleeps at his post is of little value to the owner of property placed in his charge. So, likewise, a man, if he be fully adapted to the place will, unsolicited, go

quietly to the night quarters of the stock before going to his own for the night; will be willing to rise at any hour of the night if a valuable cow is about calving, or if he hears any commotion among the stock. And, in short, at all times will be kind, gentle and considerate in his treatment, avoiding any semblance of harshness. More good beasts are spoilt by brutality or indifference than in any other way.

Having secured good help the greatest consideration of all comes in, namely the feed. The time to fit stock for winter is while we have, without artificial protection, congenial temperature, combined with such varieties in food as the growing season gives us. By supplymenting this with grains, meal, oil cake, and the like, we are in the most rapid manner enabled to put flesh on our cattle and other stock preparatory to winter. The conditions favorable for gain will soon disappear, and it is the poorest kind of policy to delay the giving of grain or ground feed till the stock are finally placed in their stalls for the winter. Special attention should be paid to the lean kine. They should be weeded out and given extra allowances of the very best food and not all of one sort.

We are aware that a prejudice exists in some quarters against clover as a winter food owing to the difficulty in curing it and getting it into the barn or stack, but for all that it is one of the best winter foods that can be given to cattle. The clover plant draws from a much greater depth than any other of the grasses. While at the same time its great expanse of leaf surface gives it advantages not possessed by the grasses that are in this respect scantily supplied. Voelcker and other authorities have never wearied in advocating the claims of clover to cultivation. They say it contains a large amount of nitrogen—three times as much as in an ordinary crop of wheat, counting both the grain and straw, During the growth of clover, a large accumulation of nitrogenous matter takes place in the soil, which is changed to nitrates. Clover removes from the soil more potash, phosphoric acid, lime, etc., which enter into the ashes of our cultivated crops, than any other crop generally cultivated. It is estimated that the roots of clover contain, when dry, from 1¾ to 2 per cent of nitrogen.

Moreover, the value of well-preserved clover as food for cattle is quite well indicated by its value to growing and fattening stock when consumed in the green and growing state. When it is borne in mind that in the curing process hay gives off nothing but water, this water being shown by careful analysis to contain none of the elements of nutrition inherent in the plant from which it was evaporated, it will readily be seen that clover dried without damags must necessarily contain all the virtues of the crop when eaten in the green and growing state.

Experiments made in Germany have shown that the roots and stubble obtained from an acre of clover sod in a depth of ten inches, had a weight of

nearly 9,000 lbs. There is no other crop that compares with it in this regard; hence, then, its great value as food for cattle and sheep, for turning under in the green state, is considered, and add to these its wealth of roots left to decay beneath the surface, putting compact clays in the best possible condition for crumbling to pieces when turned over by the plow, it is very evident that nine farmers out of ten have not enough clover on their farms. If, in feeding it out in winter, it be found that its rather rank growth has rendered it so coarse that stock show a disposition to select the leaves and more delicate stems, the whole may be cut, mixed with ground feed, and moistened. So prepared it will be found to be highly relished, and will give good returns in growth and flesh.

Having aired, what to us has become rather a hobby, namely, the cultivation of clover, we would now protest against the too free use of turnips and parsnips as winter food. At certain times of the year—in the spring, for instance—mixed with dryer food, they are both wholesome and desirable; but when you wish to bring the stock up in good warm flesh, food with more oil or fat-creating element is required. Preparatory to the coming on of cold weather, cattle require concentrated food, such as is the opposite of being watery and washy. A moment's consideration of the fact that oats or corn standing in value as seven to one, while the food value of turnips or carrots is as one hundred and fifty to one, will show that the latter should not be relied upon when strength and flesh need to be obtained without undue delay. It is intended to show by this statement of the relative values of the articles named, that seven pounds of oats or corn are equal in flesh-making value to a hundred and fifty pounds of the roots named. These are proper articles for use in connection with grains, but an animal cannot be built up as is required in the fall of the year, taking on such vitality and vigor as will enable it it to resist the cold weather of the winter months on these alone.

It is not only to the solid food of cattle in winter that we should pay attention, but also to the liquid. Recent experiments made by a large New York dealer, as narrated in the National Live Stock Journal, show that a herd of fifty-five cows preferred to walk a mile to get water at 55 degrees rather than take it at 32. At a recent largely attended convention of dairymen, testimony was borne by many of those present to the benefit derived by furnishing luke warm or tepid water to the herd in winter instead of cold. The evidence of all who had tried it was, that cows in milk in the winter season would drink about one-third more water at eighty degrees than they would at thirty-two, and that they would give twenty per cent. more milk without any increase of food, and that the milk was quite as good, and would make as much butter to the hundred pounds of milk as it would when, from using cold water, a less quantity was given.

MR. BATES AND HIS SHORT HORNS.

The histories of improved breeds of cattle scarcely supply a parallel to the rise, or to the extreme and long continued eminence, of the leading tribes of Kirklevington Short-horns. The founder of those tribes, not the owner of the first Duchess or the first Red Rose, but the man who gave the Duchess, Oxford Red Rose, Waterloo, Wild Eyes, and Foggathorpe tribes the distinct impress of his own mind (the hereditary characters approved by his judgment, and developed by his skill), bore a curiously contradictory character.

In Mr. Bates, strength and infirmity, enlightened judgment and unreasonable prejudice, were closely associated. The most ardent admiration of his own cattle was coupled with a crochet to which some of his best animals were occasionally sacrificed; his just valuation of his own work as a Short-horn breeder was in some measure discredited by his under-valuation and sometimes unjust disparagement of the work of other men. In one breath Mr. Bates would declare that the smallest proportion of any other blood for ever tainted and ruined the only good strains of blood in the world, and in the next breath, in apparently happy inconsistency, he would boast that two crosses of his own bulls on anything in the world would produce excellent results. But through all his little weaknesses his great strength manifested itself; the evidences of his singularly acute judgment, his mighty earnestness and integrity of purpose, were open to all ingenuous minds that came in contact with his own mind. His life's labor resulted in the establishment of a sub-variety of Short-horn, the like of which has not been seen. This may be said without depreciating the merit of Short-horns of other blood than that of Mr. Bates, or even asserting that the Short-horns of Mr. Bates were, or that their descendants are, the best Short-horns in existence. No one who has the least power of distinguishing types and who has a fairly

large acquaintance with Short-horns, will hesitate to allow that the Bates type, whether he likes or dislikes it, is one of remarkable peculiarity. That there are cattle descended from those of Mr. Bates, and called Bates cattle, which fail to inherit the peculiarities of the Bates type, we freely admit; but no one, indeed, would have been so eager as Mr. Bates himself to assert this, if he could have seen some of the animals which, since his day, have gone out to the world under the recommendation of his name; but instances of loss of the Short-horn character which he developed do not alter the question of the distinctiveness of the type as left by him, and as preserved by some of his followers. Of that type, in comparison with other Short-horn types, it may be said, as of the Short-horn itself in comparison with other breeds, that its special value is for crossing. The advocates of some other breeds maintain that they can beat the Short-horn in quality of beef. The advocates of the Short-horn (although they may not concede so much) take their stand upon the power of the Short-horn to improve all lean-fleshed breeds, of slow-maturing capacities, rather than upon any claim of superiority in the quality of pure Short-horn beef. If the Short-horn, they say, has sometimes an excessive proportion of fat, that is exactly the thing to meet the deficiency of the inferior breeds, to insure in the crossess the right proportions of fat and lean, and to impart that propensity to thrive and to ripen which accompanies the hereditary tendency to produce fat. With arguments of similar import the Bates men meet the objections of those who contend that Short-horns of the Kirklevington type are not perfect show animals. On certain occasions, we know, Short-horns descended exclusively from the herd of Mr. Bates have proved invincible in show competition; but the value of Bates blood for exhibitors' purposes has consisted mainly in its marked excellence as an element to mingle with other strains. Where style, high blood, refinement, a gay out-look, and superlatively mellow "touch" are wanting, "a dash of Bates," judiciously introduced, will give them all, to say nothing of the richness of color often derived from the same source. Thus, the offspring of square, logy, sleepy-looking, and somewhat harshly-handling cows may derive from bulls of Bates blood the life and statliness of carriage, abundance and bloom of coat, elasticity of skin, and prime quality of flesh which, with the solid substance and compact frame of the dams, go to make prize-winners of the highest class; and when we come to questions of practical usefulness, there is no doubt that the vigorous vitality, spirit, and activity of Short-horns of the Bates type tell in favor of the blood for general stock purposes; the cross often giving greater scale for flesh making; and where dairy properties are of importance, an advantage over most other heavy Short-horns is claimed on their behalf. That they have extensively justified these claims we cannot doubt, when we see how very many of our most practical men, after long trial, and how many of the oldest breeders in England, still stick to the tribes, and hold in high estimation the name of Mr. Bates.

THE BUSINESS OF AGRICULTURE.

The business of agriculture, in its various branches, is worked by the energies of men of very different classes; among them, the class of men to whom the growing of roots and cereals, or, often in a greater degree, the breeding of live stock, is a pleasure which only the stock-breeder or the cultivator of the soil, whose love of his calling is deep and earnest, can thoroughly understand. By example it may be illustrated. For instance, the cultivation of garden flowers, or of tender exotics under glass, the management of domestic poultry, keeping dogs, small birds, and other recreations drawn from either the vegetable or the animal orders of creation, may be made sources of inexpressible delight, illustrating that of the genuine breeder of farm live stock, and of the grower of farm crops. There are also among the classes of agriculture those who regard their work merely as that of the business which they have chosen, and who desire to be successful, as the tradesmen of the town desires to be successful, partly for the means of living and of providing for a family, and partly for credit's sake. No man, in war or peace, likes to be vanquished baffled, unsuccessful; and the desire for self-maintenance, and for the power to support more than self, is honorable. The man who starts in agriculture and stock breeding upon these lines has nothing to be ashamed of. If he can carry out his undertakings creditably, and gather a profit, he wins his game. For the instruments by which he wins, his crops, his stock, he has no more warmth of regard than the grocer has for his sugar or the shoemaker for his leather. Perhaps we here do wrong to the latter article, as it comes, or is supposed to come, more intimately into connection with the craftman's mind than an article, like sugar, which merely passes through the dealer's hands. We have seen a son of St. Crispin look lovingly upon a piece of choice leather and handle it with perhaps as much pleasure as the breeder felt in handling the living hide, of which that bit of dressed leather once formed part; but the pound of sugar, if the laws, moral or statutory, against adulteration, are duly observed, is not, like the pair of boots, produced by the brain and

hands of him who supplies. The difference here pointed out may serve further to indicate our meaning, and the psychological reasons for the greater or lesser depth of interest that a man feels in the business pursuits of his life. The kind of breeder that we venture to call the genuine breeder (to distinguish him, not invidiously as regards the other, from the breeder whose satisfactory balance sheet is his sufficient reward for honest industry), the genuine breeder, we say, while not indifferent to financial results, is so heartily in harmony with his work, that a trivial pecuniary loss, if it comprise the failure or abortive ending of an experiment in breeding, is often much more keenly deplored than a heavier loss in money not so coupled with dissappointment of an object of the mind. It is, for the same reason—that is harmonious employment of the mind upon the work—that the genuine breeder feels a degree of sadness and regret, not felt by the other, as life's *work-day* wanes. What, he wonders, will become of his stud, his herd, his flock? It will be dispersed, or mismanaged; not managed as *he* would continue to manage it; and soon the impress of his own mind will disappear. The painter leaves behind him work which he hopes may stand good for centuries; the sculptor, work to stand for ages; the man of letters, if owning the thirst for fame—"That last infirmity of noble minds"—at least hopes, and perhaps believes, that his words will be recalled by remote generations to come; but the poor stock breeder feels as one who has written his mind upon the sands of the sea, which the coming tide, effacing his record, will print once more with ocean's hieroglyphics, the models of her waves. He has done his work with earnest pleasure, and done it well. There it is; but, take away his mind for a few years, and where is it? Gone! As if he never had thought, never had worked, never had lived. There is some truth in this natural regret. The drop which he has contributed may lose itself in the stream, but in all probability he has done more lasting good than he knows. The dispersion of his stock is the dissemination of its influence for manifold good. Some seeds, surely, will fall on good ground, and become abundantly fruitful. If not indeed the *materials* that he has given to the world, the *principles* upon which he acted are more widely brought into service through his instrumentality. He has learned his lesson as a student of nature, and of that which we may fairly call art, and perhaps by words, perhaps silently, by example has passed on to younger minds some part of the knowledge gained in the labor of his life.

THE YOUNG HORSE FROM PASTURE TO WINTER QUARTERS.

The system of the young horse, full of the elements of recuperation and growth, is admirably calculated to resist the effect of the mistakes in caring for him. The summer season at grass is favorable to the growing hoof, the weight being divided between the outer rim and the frog, thus insuring a circular-growing hoof; and the moist, soft footing gives guarantee of the absence of feverishness in the feet, and an abundant growth of horn. But in changing to winter quarters, the influences may be, and sometimes are, very different. On farms where corn is a leading crop, the boys or the hired men are quite likely to put the young, growing things upon a full ration of corn twice daily, to compensate for the absence of grass. After the colt has been kept standing upon the plank for a time, corn being freely given, a careful examination of the feet will show that the temperature in these is higher by several degrees, and this change is the incipient and initiatory step towards what will, after a few accessions of this sort of feverishness, lay the foundation for gradual contraction at the heel and brittleness of the wall of the hoof. The season following a winter's treatment of this kind—will find the hoof brittle—more so than the season before—and it will be found, even at pasture, showing a tendency to break at the rim. Perhaps this will be but slight, but it is the forerunner to more permanent and serious trouble with the feet when the horse is transferred to hard pavements and high grain feeding the year round, and is doomed to have the hoof unskilfully cut, burned, and nailed twelve times during the year.

Colts taken from pasture should be generously fed and kept growing, but tact is required in doing this, that no impairment come to the system or any part of it. If by injudicious feeding and confinement, after the colt has spent his summer upon grass, having the range of the pasture for exercise, the digestion becomes a little impaired, this is likely to be nothing more than a functional trouble that will, with due care, entirely pass away. But trouble arising within the feet is quite likely to be organic, permanently changing the shape of the hoof. This may be slight while the animal is yet a colt, but it will

grow apace and become each year more a trouble to be regretted, when the animal is, after maturity, put to full work and kept on high feed, wearing shoes, the year round.

By all means keep the young horse stock growing as vigorously in winter as in summer, if possible, through a judicious, suitable system of feeding. Excessive feeding on rich, fat-making food,—and corn comes prominently forward in this class, the colt being tied up in his stall much of the time—may rightly be likened to firing up a locomotive till the steam gauge shows a high pressure, and then leaving it to stand idly upon the track. There should be exercise, and plenty of it, given to the young colt, that he may work off the superabundant animal heat generated by full feeding. This is required for the good of his body, and also in an especial degree, for the benefit of his feet. Exercise is required, not only that the feet may be kept a part of the time off the plank and permitted to have the cooling and softening influence which comes of contact with the moist earth, but equally that the forward part of the bottom of the hoof may be kept duly worn down, that the right angle of inclination of hoof and pastern be maintained. Where the weight is thrown upon the heel, the outer wall of the hoof, at the heel, will be found to break over inwardly, towards spring, where unshod colts are kept upon plank much of the time during winter. It will be wise to let the colt run out sufficiently to keep the feet properly leveled up, and where this is not accomplished through exercise, the knife of the smith should be brought into requisition, that the hoof may maintain its upright position, by which means only can the forward half of the foot be made to bear its portion of the weight of the body.

The young horse upon grass is, if in health, always loose in his bowels. This condition prevents feverishness of either body or feet, and it is well to imitate this condition through giving suitable food. Oats, with a little oil-cake meal added, once or twice daily, will meet this requirement. In the absence of the cake meal, or even in conjunction with it, bran may be given with advantage. Young horses can be safely kept in a good state of flesh, and be made to grow during winter as well as during summer, by maintaining the summer conditions. A reasonable display of tact and judgment will enable any man to do this, but it cannot be done by carelessly feeding corn to the young stock, as is too common in the case.

Feeding and Management of Cattle.

No branch of dairy farming can compare in importance with the management of cows. The highest success will depend upon it, whatever breed be selected, and whatever amount of care and attention be given to the points of the animals; for experience will show that very little milk comes out of the bag, that is not first put into the throat. It is poor economy, therefore, to attempt to keep too many cows for the amount of feed one has; for it will generally be found that one good cow well bred and well fed will yield as much as two ordinary cows kept in the ordinary way; while a saving is effected both in labour and room required, and in the risks on the capital invested. If an argument for the larger number on poorer feed is urged on the ground of the additional manure—which is the only basis upon which it can be put—it is enough to say that it is a very expensive way of making manure. It is not too strong an assertion, that a proper regard to profit and economy would require many an American farmer to sell off nearly half of his cows, and to feed the whole of his hay and roots hitherto used into the remainder.

An animal, to be fully fed and satisfied, requires a quanty of food in proportion to its live weight. No feed is complete that does not contain a sufficient amount of nutritive elements; hay, for example, being more nutritive than straw, and grains than roots. The food, too, must possess a bulk sufficient to fill up to a certain degree the organs of digestion of the stomach; and, to receive the full benefit of its food, the animal must be wholly satisfied—since, if the stomach is not sufficiently distended, the food cannot be properly digested, and of course many of the nutritive principles which it contains cannot be perfectly assimilated. An animal regularly fed eats till it is satisfied, and no more than is requisite. A part of the nutritive elements in hay and other forage plants is needed to keep an animal on its feet—that is, to keep up its condition—and if the nutrition of its food is insufficient for this, the weight decreases, and if it is more than sufficient the weight increases, or else this excess is consumed in the production of milk or in labour. About one-sixtieth of their live weight in hay, or its equivalent, will keep horned cattle on their feet; but, in order to be completely nourished, they require about one-thir-

tieth in dry substances, and four-thirtieths in water, or other liquid contained in their food. The excess of nutritive food over and above what is necessary to sustain life will go, in milch cows, generally to the production of milk, or to the growth of the fœtus, but not in all cows to an equal extent, the tendency to the secretion of milk being much more developed in some than in others.

With regard, however, to the consumption of food in proportion to the live weight of the animal, it must be taken, in common with all general principles, with some qualifications. The proportion is probably not uniform as applied to all breeds indiscriminately, though it may be more so as applied to animals of the same breed. The idea of some celebrated stock-raisers has been that the quantity of food required depends much upon the shape of the barrel; and it is well known that an animal of a close, compact, well-rounded barrel, will consume less than one of an opposite make.

The variations in the yield of milch cows are caused more by the variations in the nutritive elements of their food than by a change of the form in which it is given. A cow, kept through the winter on mere straw, will cease to give milk; and, when fed in spring on green forage, will give a fair quantity of milk. But she owes the cessation and restoration of the secretion, respectively, to the diminution and increase of her nourishment, and not at all to the change of form, or of outward substance in which the nutriment is administered. Let cows receive through winter nearly as large a proportion of nutritive matter as is contained in the clover, lucerne, and fresh grass which they eat in summer, and, no matter in what precise substance or mixture that matter be contained, they will yield a winter's produce of milk quite as rich in caseine and butyraceous ingredience as the summer's produce, and far more ample in quantity than almost any dairyman with old-fashioned notions would imagine to be possible. The great practical error on this subject consists, not in giving wrong kinds of food, but in not so proportioning and preparing it as to render an average ration of it equally rich in the elements of nutrition, and especially in nitrogenous elements as an average ration of the green and succulent food of summer.

We keep too much stock for the quantity of good and nutritious food which we have for it; and the consequence is, that cows are, in nine cases out of ten, poorly wintered, and come out in the spring weakened, if not, indeed, positively diseased, and a long time is required to bring them into a condition to yield a generous quantity of milk.

It is a hard struggle for a cow reduced in flesh and in blood to fill up the wasted system with the food which would otherwise have gone to the secretion of milk; but, if she is well fed, well housed, well littered, and well supplied with pure fresh water, and with roots, or other *moist* food, and properly treated to the luxury of a frequent carding, and constant kindness, she comes

out ready to commence the manufacture of milk under favourable circumstances.

Keep the cows constantly in good condition, ought, therefore, to be the motto of every dairy farmer, posted up over the barn, and on and over the stalls, and over the milk-room, and repeated to the boys whenever there is danger of forgetting it. It is the great secret of success; and the difference between success and failure turns upon it. Cows in milk require more food in proportion to their size and weight than either oxen or young cattle.

In order to keep cows in milk well and economically, regularity is next in importance to a full supply of wholesome and nutritious food. The animal stomach is a very nice chronometer, and it is of the utmost importance to observe regular hours in feeding, cleaning, and milking. This is a point also, in which very many farmers are at fault—feeding whenever it happens to be convenient. The cattle are thus kept in a restless condition, constantly expecting food when the keeper enters the barn; while, if regular hours are strictly adhered to, they know exactly when they are to be fed, and they rest quietly till the time arrives. If one goes into any well-regulated dairy establishment an hour before feeding, scarcely an animal will rise to its feet; while, if it happens to be the hour of feeding, the whole herd will be likely to rise and seize their food with an avidity and relish not to be mistaken.

With respect to the exact nurture to be pursued, no rule could be prescribed which would apply to all cases; and each individual must be governed much by circumstances, both regarding the particular kinds of feed at different seasons of the year, and the system of feeding. It has been found—it may be stated—in the practice of the most successful dairymen, that, in order to encourage the largest secretion of milk in stalled cows, one of the best courses is, to feed in the morning, either at the time of milking—which is preferred by many—or immediately after, with cut feed, consisting of hay, oats, millet, or cornstalks, mixed with shorts, and Indian, linseed, or cotton-seed meal, thoroughly moistened with water. If in winter, hot or warm water is far better than cold. If given at milking-time, the cows will generally give down their milk more readily. The stalls and mangers should first be thoroughly cleansed.

Roots and long hay may be given during the day; and at the evening milking, or directly after, another generous meal of cut feed, well moistened and mixed, as in the morning. No very concentrated food, like grains alone, or oil-cakes, should be fed early in the morning on an empty stomach, although it is sanctioned by the practice in the London milk-dairies. The processes of digestion go on best when the stomach is sufficiently distended; and for this purpose the bulk of food is almost as important as the nutritive qualities. The flavour of some roots, as cabbages and turnips, is more apt to be imparted to the flesh and milk when fed on an empty stomach than otherwise. After the cows have been milked and have finished their cut feed, they are

carded and curried down, in well-managed dairies, and then either watered in the stall—which, in very cold or stormy weather, is far preferable—or turned out to water in the yard. While they are out, if they are let out at all, the stables are put in order; and, after tying them up, they are fed with long hay, and left to themselves till the next feeding time. This may consist of roots—such as cabbages, beets, carrots, or turnips sliced—or of potatoes, a peck, or—if the cows are very large—a half-bushel each, and cut feed again at the evening milking, as in the morning; after which, water in the stall, if possible.

The less cows are exposed to the cold in winter, the better. They eat less, thrive better, and give more milk, when kept housed all the time, than when exposed to the cold. A case is on record, where a herd of cows, which had usually been supplied from troughs and pipes in the stalls, were, on account of an obstruction in the pipes, obliged to be turned out thrice a day to be watered in the yard. The quantity of milk instantly decreased, and in three days the diminution became very considerable. After the pipes were mended, and the cows again watered, as before, in their stalls, the flow of milk returned. This, however, must be governed much by the weather; for in very mild and warm days it may be judicious not only to let them out, but to allow them to remain out for a short time, for the purpose of exercise.

Any one can arrange the hour for the several processes named above, to suit himself; but, when once fixed, it should be rigidly and regularly followed. If the regular and full feeding be neglected for even a day, the yield of milk will immediately decline, and it will be very difficult to restore it. It may be safely asserted, as the result of many trials and long practice, that a larger flow of milk follows a complete system of regularity in this respect than from a higher feeding where this system is not adhered to.

One prime object which the dairyman should have constantly in view is, to maintain the animal in a sound and healthy condition. Without this, no profit can be expected from a milch cow for any considerable length of time; and, with a view to this, there should be an occasional change of food. But, in making changes, great care is requisite in order to supply the needful amount of nourishment, or the cow will fall off in flesh, and eventually in milk. It should, therefore, be remembered that the food consumed goes not alone to the secretion of milk, but also to the growth and maintenance of the bony structure, the flesh, the blood, the fat, the skin, and the hair, and in exhalations from the body. These parts of the body consist of different organic constituents. Some are rich in nitrogen, as the fibrine of the blood and albumen; others destitute of it, as fat; some abound in inorganic salts, phosphate of lime, and salts of potash. To explain how the constant waste of these substances may be supplied, a celebrated chemist observes that the albumen, gluten, caseine, and other nitrogenized principles of food, supply the animal with the materials

requisite for the formation of muscle and cartilage; they are, therefore, called flesh-forming principles.

Fats, or oily matters of the food, are used to lay on fat, or for the purpose of sustaining respiration.

Starch, sugar, gum, and a few other non-nitrogenized substances, consisting of carbon, oxygen, and hydrogen, supply the carbon given off in respiration, or they are used for the production of fat.

Phosphate of lime and magnesia in food principally furnish the animal with the materials of which the bony skeleton of its body consists.

Saline substances—chlorides of sodium and potassium, sulphate and phosphate of potash and soda, and some other mineral matters occurring in food—supply the blood, juice of flesh, and various animal juices, with the necessary mineral constituents.

The healthy state of an animal can thus only be preserved by a mixed food; that is food which contains all the proximate principles just noticed. Starch or sugar alone cannot sustain the animal body, since neither of them furnishes the materials to build up the fleshy parts of the animal. When fed on substances in which an insufficient quantity of phosphates occurs, the animal will become weak, because it does not find any bone-producing principle in its food. Due attention should, therefore, be paid by the feeder to the selection of food which contains all the kinds of matter required, nitrogenized, as well as non-nitrogenized, and mineral substances; and these should be mixed together in the proportion which experience points out as best for the different kinds of animals, or the particular purpose for which they are kept.

Relative to the nutrition of cows for dairy purposes, milk may be regarded as a material for the manufacture of butter and cheese; and according to the purpose for which the milk is intended to be employed, whether for the manufacture of butter or the production of cheese, the cow should be differently fed.

Butter contains carbon, oxygen, and hydrogen, and no nitrogen. Cheese, on the contrary, is rich in nitrogen. Food which contains much fatty matter, or substances which in the animal system are readily converted into fat, will tend to increase the proportion of cream in milk. On the other hand the proportion of caseine or cheesy matter in milk is increased by the use of highly nitrogenized food. Those, then, who desire much cream, or who produce cream for the manufacture of butter, select food likely to increase the proportion of butter in the milk. On the contrary, where the principal object is the production of milk rich in curd—that is, where cheese is the object of the farmer—clover, peas, bran-meal, and other plants which abound in legumine—a nitrogenized organic compound, almost identical in properties and composition with casbine, or the substance which forms the curd of milk—will be selected.

And so the quality, as well as the quantity, of butter in the milk, depends

on the kind of food consumed, and on the general health of the animal. Cows fed on turnips in the stall always produce butter inferior to that of cows living upon the fresh and aromatic grasses of the pastures.

Succulent food in which water abounds—the green grass of irrigated meadows, green clover, brewers' and distillers' refuse, and the like—increases the quantity, rather than the quality, of the milk; and by feeding these substances the milk-dairyman studies his own interest, and makes thin milk without diluting it with water—though, in the opinion of some, this may be no more legitimate than watering the milk.

But, though the yield of milk may be increased by succulent or watery food, it should be given so as not to interfere with the health of the cow.

Food rich in starch, gum, or sugar, which are the respiratory elements, an excess of which goes to the production of fatty matters, increases the butter in milk. Quietness promotes the secretion of fat in animals and increases the butter. Cheese will be increased by food rich in albumen, such as the leguminous plants.

The most natural, and of course the healthiest, food for milch cows in summer, is the green grass of the pastures; and when these fail from drought or over-stocking, the complement of nourishment may be made up with green clover, green oats, barley, millet, or corn-fodder, and cabbage-leaves, or other succulent vegetables; and if these are wanting, the deficiency may be partly supplied with shorts, Indian-meal, linseed or cotton-seed meal. Green grass is more nutritious than hay, which always loses somewhat of its nutritive properties in curing; the amount of the loss depending chiefly on the mode of curing, and the length of exposure to sun and rain. But, apart from this, grass is more easily and completely digested than hay, though the digestion of the latter may be greatly aided by cutting and moistening, or steaming; and by this means it is rendered more readily available, and hence far better adapted to promote a large secretion of milk, a fact too often overlooked even by many intelligent farmers.

In autumn, the best feed will be the grasses of the pastures, so far as they are available, green-corn fodder, cabbage, carrot, and turnip leaves, and an addition of meal or shorts. Towards the middle of autumn, the cows fed in the pastures will require to be housed regularly at night, especially in the more northern latitudes, and put, in part at least, upon hay. But every farmer knows that it is not judicious to feed out the best part of his hay when his cattle are first put into the barn, and that he should not feed so well in the early part of winter that he cannot feed better as the winter advances.

At the same time, it should always be borne in mind that the change from grass to a poor quality of hay or straw, for cows in milk, should not be too sudden. A poor quality of dry hay is far less palatable in the early part of winter, after the cows are taken from grass, then at a later period; and, if

it is resorted to with milch cows; will invariably lead to a falling off in the milk, which no good feed can afterwards wholly restore.

It is desirable, therefore, for the farmer to know what can be used instead of his best English or upland meadow hay, and yet not suffer any greater loss in the flow of milk, or in condition, than is absolutely necessary. In some sections of the Eastern States, the best quality of swale hay will be used; and the composition of that is as variable as possible, depending on the varieties of the grasses of which it was made, and the manner of curing. But, in other sections, many will find it necessary to use straw and other substitutes. Taking good English or meadow hay as the standard of comparison, and calling that one 4.79 times the weight of rye-straw, or 3.83 times the weight of oat-straw, it contains the same amount of nutritive matter; that is, it would take 4.79 times as good rye-straw to produce the same result as good meadow hay.

In winter, the best food for cows in milk will be good sweet meadow hay, a part of which should be cut and moistened with water—as all inferior hay or straw should be—with an addition of root-crops, such as turnips, carrots, parsnips, potatoes, mangold wurtzel, with shorts, oil-cake, Indian meal, or bean meal.

It is the opinion of most successful dairymen that the feeding of moist food cannot be too highly recommended for cows in milk; especially to those who desire to obtain the largest quantity. Hay cut and thoroughly moistened becomes more succulent and nutritive, and partakes more of the nature of green grass.

It has been remarked by chemists in this connection that the great value of linseed-cake, as an adjunct to hay, for fat cattle and milch cows, has been long recognized; and that it is undeniably traceable, in the main, to three ingredients of the seeds of the oil-yielding plants. The value of food depends upon the quantities of matters it contains which may be appropriated by the animal which consumes the food. Now, it is proved that the fat of animals is derived from the starch, gum, and sugar, and more directly and easily from the oil of the food. These four substances then, are fat-formers. The muscles, nerves, and tendons of animals, the brine of their blood and the curd of their milk, are almost identical in composition with, and strongly similar in many of their properties to, matters found in all vegetables, but chiefly in such as form the most concentrated food. These blood (and muscle) formers are characterized by containing about fifteen and a half per cent. of nitrogen; and hence are called nitrogenous substances. They are, also, often designated as the albuminous bodies.

The bony framework of the animal owes its solidity to phosphate of lime, and this substance must be furnished by the food. A perfect food must supply the animal with these three classes of bodies, and in proper proportions. The addition of a small quantity of a food, rich in oil and albuminous sub-

stances, to the ordinary kinds of feed, which contain a large quantity of vegetable fibre or woody matter, more or less indigestible, but, nevertheless indispensable to the herbivorous animals, their digestive organs being adapted to a bulky food, has been found highly advantageous in practice. Neither hay alone nor concentrated food alone gives the best results. A certain combination of the two presents the most advantages.

During the winter season, as has been already remarked, a frequent change of food is especially necessary, both as contributions to the general health of animals, and as a means of stimulating the digestive organs, and thus increasing the secretion of milk. A mixture used as cut feed and well moistened is now especially beneficial, since concentrated food, which would otherwise be given in small quantities, may be united with larger quantities of coarser and less nutritive food, and the complete assimilation of the whole be better secured. On this subject it has been sensibly observed that the most nutritious kinds of food produce little or no effect when they are not digested by the stomach, or if the digested food is not absorbed by the lymphatic vessels, and not assimilated by the various parts of the body. Now, the normal functions of the digestive organs not only depend upon the composition of the food, but also on its volume. The volume or bulk of the food contributes to the healthy action of the digestive organs, by exercising a stimulating effect upon the nerves which govern them. Thus the whole organization of ruminating animals necessitates the supply of bulky food, to keep the animal in good condition.

Feed sweet and nutritious food, therefore, frequently, regularly, in small quantities, and change it often, and the best results may be confidently anticipated. If the cows are not in milk, but are to come in in the spring, the difference in feeding should rather be in the quantity than the quality, if the highest yield is to be expected from them during the coming season.

The most common feeding is hay alone, and oftentimes very poor hay at that. The main point is to keep the animal in a healthy and thriving condition, and not to suffer her to fall in flesh; and with this object, some change and variety of food are highly important. Toward the close of winter a herd of cows will begin to come in, or approach their time of calving. Care should then be taken not to feed too rich or stimulating food for the last week or two before this event, as it is often attended with ill consequences. A plenty of hay, a few potatoes or shorts, and pure water will suffice.

In spring, the best feeding for dairy cows will be much the same as that for winter; the roots in store over winter, such as carrots, mangold wurtzel, turnips, and parsnips, furnishing very valuable aid in increasing the quantity and improving the quality of milk. Toward the close of this season, and before the grass of pastures is sufficiently grown to make it judicious to turn out the cows, the best dairymen provide a supply of green fodder in the shape of winter rye, which, if cut while it is tender and succulent, and before it is half

grown, will be greatly relished. Unless cut young, however, its stalk soon becomes hard and unpalatable.

All practical dairymen agree in saying that a warm and well-ventilated barn is indispensable to the promotion of the highest yield of milk in winter; and most agree that cows in milk should not be turned out, even to drink, in cold weather, all exposure to cold tending to lessen the yield of milk.

The Barn.—The farm barn, next to the farm house, is the most important structure of the farm itself. Indeed, to the eyes of a person of taste, a farm or plantation appears incomplete, without good barn accommodations, as much as without good household appointments—and without them, no agricultural establishment can be complete in all its proper economy.

In the structure of the barn, and in its interior accommodation, much will depend upon the branches of agriculture to which the farm is devoted. A farm cultivated in grain chiefly requires but little room for stabling purposes. Storage for grain in the sheaf, and granaries, will require its room; while a stock farm requires a barn with extensive hay storage, and stables for its cattle, horses, and sheep, in all climates which do not admit of such stocks living through the winter in the field, as is the case in the great grazing districts west of the Alleghanies. Again, there are wide districts of country where a mixed husbandry of grain and stock is pursued, which require barns and outbuildings accommodating both.

It may be well here to remark that many designers of barns, sheds, and other outbuildings for the accommodation of farm stock, have indulged in fanciful arrangements for the comfort and convenience of animals, which are so complicated that when constructed as they sometimes are, the practical, common-sense farmer will not use them; and by reason of the learning which is required for their use, they are altogether unsuitable for the treatment and use which they generally receive from those who have the daily care of the stock for which they are intended, and for the rough usage which they experience from the animals themselves. A very pretty and plausible arrangement of stabling, feeding, and all the other requirements of a barn establishment may be thus got up by an ingenious theorist at the fireside, which will work charmingly as he dilates upon its good qualities, untried; but which, when subjected to experiment, will be utterly worthless for practical use. There can be no doubt that the simplest plan of construction, consistent with an economical expenditure of the material of food for the consumption of stock, is by far the most preferable.

Another item to be considered in this connection, is the comparative value of the stock, the forage fed to them, and the labour expended in feeding and taking care of them. To illustrate: Suppose a farm to lie in the vicinity of a large town or city. Its value is, perhaps, a hundred dollars an acre. The hay cut upon it is worth fifteen dollars a ton, at the barn, and straw and

coarse grains in proportion, and hired labour ten or twelve dollars a month. Consequently, the manager of this farm should use all the economy in his power, by the aid of cutting-boxes and other machinery, to make the least amount of forage supply the wants of his stock; and the internal economy of his barn should be arranged accordingly, since labour is his cheapest item, and food his dearest. Therefore, any contrivance by which to work up his forage the closest—by way of machinery, or manual labour—so that it shall serve the purposes of keeping his stock, is true economy; and the making and saving of manures are items of the first importance. His buildings and their arrangements throughout should, for these reasons, be constructed in accordance with his practice.

If, on the other hands, land are cheap and productive, and labour comparatively dear, a different practice will prevail. The farmer will feed his hay from the mow without cutting. The straw will be stacked out, and the cattle turned to it, to pick what they like of it, and make their beds of the remainder; or, if it is housed, he will throw it into racks, and the stock may eat what they choose. To do this requires but one-third, or one-half, of the labour which is required by the other mode, and the saving in this makes up, and perhaps more than makes up, for the increased quantity of forage consumed.

Again, climate may equally affect the mode of winter-feeding the stock. The winters may be mild. The hay may be stacked in the fields when gathered, or put into small barns built for hay storage alone; and the manure scattered over the fields by the cattle, as they are fed from either of them, may be knocked to pieces with the dung-beetle, in the spring, or harrowed and bushed over the ground; and with the very small quantity of labour required in all this, such practice will be more economical than any other which can be adopted.

In latitudes, however, in which it becomes necessary to stall-feed during several months of the year; barns are indispensable. These should be warm, and at the same time well ventilated. The barn should be arranged in a manner suitable to keeping hay and other fodder dry any sweet, and with reference to the comfort and health of the animals, and the economy of labour and manure. The size and finish will, of course, depend on the wants and means of the farmer or dairyman; but many little conveniences, it should not be forgotten, can be added at comparatively trifling cost.

The most economical plan for room in tying cattle in their stalls, is to fasten the rope or chain, whichever is used—the wooden stanchion, or stanchel as it is called, to open and shut, enclosing the animal by the neck, being objectionable—into a ring, which is secured by a strong staple into a post. This prevents the cattle from interfering with each other, while a partition effectually prevents any contact from the animals on each side of it, in the separate stalls.

There is no greater benefit for cattle, after coming into winter-quarters, than a systematic regularity in everything pertaining to them. Every animal should have its own particular stall in the stable, where it should always be kept. The cattle should be fed and watered at certain fixed hours of the day, as near as may be. If let out of the stables for water, unless the weather is very pleasant—when they may be permitted to lie out for a short ttime—they should be immediately put back, and not allowed to range about with the outside cattle. They are more quiet and contented in their stables than elsewhere, and waste less food than if permitted to run out; besides being in every way more comfortable, if properly bedded and attended to, as everyone will find upon trial. The habit which many farmers have, of turning their cattle out of the stables in the morning, in all weathers—letting them range about in a cold yard, hooking and annoying each other—is of no possible benefit, unless it be to rid them of the trouble of cleaning the stables, which pays more than twice its cost in the saving of manure. The outside cattle, which occupy the yard—if there are any—are all the better that the stabled ones do not interfere with them. They become habituated to their own quarters, as do the others, and all are better for being, respectively, in their proper places.

Milking.—The manner of milking exerts a more powerful and lasting influence on the productiveness of the cow than most farmers are aware. That a slow and careless milker soon dries up the best of cows, every practical farmer and dairyman knows; but a careful examination of the beautiful structure of the udder will serve further to explain the proper mode of milking, in order to obtain and keep up the largest yield.

The udder of a cow consists of four glands, disconnected from each other, but all contained within one bag or cellular membrane; and these glands are uniform in structure. Each gland consists of three parts: the *glandular*, or secreting part, *tubular* or conducting part, and the *teats*, or receptacle, or receiving part. The glandular forms by far the largest portion of the udder. It appears to the naked eye composed of a mass of yellowish grains; but under the microscope these grains are found to consist entirely of minute blood-vessels forming a compact plexus, or fold. These vessels secrete the milk from the blood. The milk is abstracted from the blood in the glandular part; the tubes receive and deposit it in the reservoir, or receptacle; and the sphincter at the end of the teat retains it there until it is wanted for use.

This must not be understood, however, as asserting that all the milk drawn from the udder at one milking is contained in the receptacle. The milk, as it is secreted, is conveyed to the receptacle, and when that is full, the larger tubes begin to be filled, and next the smaller ones, until the whole become gorged. When this takes place, the secretion of the milk ceases, and absorption of the thinner or more watery part commences. Now, as this ab-

sorption takes place more readily in the smaller or more distant tubes, it is invariably found that the milk from these, which comes last into the receptacle, is much thicker and richer than what was first drawn off. This milk has been significantly styled afterings, or strippings; and should this gorged state of the tubes be permitted to continue beyond a certain time, serious mischief will sometimes occur; the milk becomes too thick to flow through the tubes, and soon produces, first irritation, then inflammation, and lastly suppuration, and the function of the gland is materially impaired or altogether destroyed. Hence the great importance of emptying these smaller tubes regularly and thoroughly, not merely to prevent the occurrence of disease, but actually to increase the quantity of milk; for, so long as the smaller tubes are kept free, milk is constantly forming; but whenever, as has already been mentioned, they become gorged, the secretion of milk ceases until they are emptied. The cow herself has no power over the sphincter at the end of her teat, so as to open it, and relieve the overcharged udder; neither has she any power of retaining the milk collected in the reservoirs when the spasm of the sphincter is overcome.

Thus is seen the necessity of drawing away the last drop of milk at every milking; and the better milker the cow, the more necessary this is. What has been said demonstrates, also, the impropriety of holding the milk in cows until the udder is distended much beyond its ordinary size, for the sake of showing its capacity for holding milk—a device to which many dealers in cows resort.

Thus much of the internal structure of the udder. Its external form requires attention, because it indicates different properties. Its form should be spheroidal, large, giving an idea of capaciousness; the bag should have a soft, fine skin, and the hind part upward toward the tail be loose and elastic. There should be fine, long hairs scattered plentifully over the surface, to keep it warm. The teats should not seem to be contracted, or funnel-shaped, at the inset with the bag. In the former state teats are very apt to become corded or spindled; and in the latter too much milk will constantly be pressing on the lower tubes or receptacle. They should drop naturally from the lower parts of the bag, being neither too short, small, or dumpy, or long, flabby, and thick, but, perhaps about three inches in length, and so thick as just to fill the hand. They should hang as if all the quarters of the udder were equal in size, the front quarters projecting a little forward, and the hind ones a little more dependent. Each quarter should contain about equal quantities of milk; though in the belief of some, the hind quarters contain rather the most.

Largely developed milk-veins—as the subcutaneous veins along the under part of the abdomen are commonly called—are regarded as a source of milk. This is a popular error, for the milk-vein has no connection with the udder; yet although the office of these is to convey the blood from the fore part of

the chest and sides to the inguinal vein, yet a large milk-vein certainly indicates a strongly developed vascular system—one favourable to secretions generally, and to that of the milk among the rest.

Milking is performed in two ways, stripping and handling. *Stripping* consists in seizing the teat firmly near the root between the face of the thumb and the side of the fore-finger, the length of the teat passing through the other fingers, and in milking the hand passes down the entire length of the teat, causing the milk to fly out of its point in a forcible stream. The action is renewed by again quickly elevating the hand to the root of the teat. Both hands are employed at the operation, each having hold of a different teat, and being moved alternately. The two nearest teats are commonly first milked, and then the two farthest. *Handling* is done by grasping the teat at its root with the fore-finger like a hoop, assisted by the thumb, which lies horizontally over the fore-finger, the rest being also seized by the other fingers. Milk is drawn by pressing upon the entire length of the teat in alternate jerks with the entire palm of the hand. Both hands being thus employed, are made to press alternately, but so quickly following each other that the alternate streams of milk sound to the ear like one forcible continued stream. This continued stream is also produced by stripping. Stripping, then, is performed by pressing and passing certain fingers along the teat; handling, by the whole hand doubled, or fist, pressing the teat steadily at one place. Hence the origin of both names.

Of these two modes, handling is the preferable, since it is the more natural method—imitating, as it does, the suckling of the calf. When a calf takes a teat into its mouth, it makes the tongue and palate by which it seizes it play upon the teat by alternate pressures or pulsations, while retaining the teat in the same position. It is thus obvious that handling is somewhat like sucking, whereas stripping is not at all like it. It is said that stripping is good for agitating the udder, the agitation of which is conducive to the withdrawal of a large quantity of milk; but there is nothing to prevent the agitation of the udder as much as the dairymaid pleases, while holding in the other mode. Indeed, a more constant vibration could be kept up in that way by the vibrations of the arms than by stripping. Stripping, by using an unconstrained pressure on two sides of the teat, is much more apt to press it unequally, than by grasping the whole teat in the palm of the hand; while the friction occasioned by passing the finger and thumb firmly over the outside of the teat is more likely to cause heat and irritation in it than a steady and full grasp of the entire hand. To show that this friction causes an unpleasant feeling even to the dairymaid, she is obliged to lubricate the teat frequently with milk, and to wet it at first with water; whereas the other mode requires no such expedients. And as a further proof that stripping is a mode of milking which may give pain to the cow, it cannot be employed, when the teats are chapped, with so much ease to the cow as handling.

The first requisite in the person that milks is, of course, the utmost *cleanliness*. Without this, the milk is unendurable. The udder should, therefore, be carefully cleaned before the milking commences.

Milking should be done *fast*, to draw away the milk as quickly as possible, and it should be continued as long as there is a drop of milk to bring away. This is an issue which cannot be attended to in too particular a manner. If any milk is left, it is re-absorbed into the system, or else becomes caked, and diminishes the tendency to secrete a full quantity afterward. Milking as dry as possible is especially necessary with young cows with their first calf; as the mode of milking and the length of time to which they can be made to hold out, will have very much to do with their milking qualities as long as they live. Old milk left in the receptacle of the teat soon changes into a curdy state, and the caseous matter not being at once removed by the next milking, is apt to irritate the lining membrane of the teat during the operation, especially when the teat is forcibly rubbed down between the finger and thumb in stripping. The consequence of this repeated irritation is the thickening of the lining membrane, which at length becomes so hardened as to close up the orifice at the end of the teat. The hardened membrane may be easily felt from the outside of the teat, when the teat is said to be *corded*. After this the teat becomes *deaf*, as it is called, and no more milk can afterward be drawn from the quarter of the udder to which the corded teat is attached.

The milking-pail is of various forms and of various materials. The Dutch use brass ones, which are brilliantly scoured every time they are in use. Tin pitchers are used in some places, while pails of wood in cooper-work are employed in others. A pail of oak, having thin staves bound together by bright iron hoops, with a handle formed by a stave projecting upward, is convenient for the purpose, and may be kept clean and sweet. One nine inches in diameter at the bottom, eleven inches at the top, and ten inches deep, with an upright handle or leg of five inches, has a capacious enough mouth to receive the milk as it descends; and a sufficient height, when standing on the edge of its bottom on the ground, to allow the dairymaid to grasp it firmly with her knees while sitting on a small three-legged stool. Of course, such a pail cannot be milked full; but it should be large enough to contain all the milk which a single cow can give at a milking; because it is undesirable to rise from a cow before the milking is finished, or to exchange one dish for another while the milking is in progress.

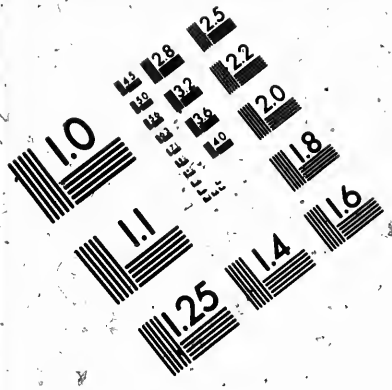
The cow being a sensitive and capricious creature, is oftentimes so easily offended that if the maid rise from her before the milk is all withdrawn, the chances are that she will not again stand quietly at that milking; or, if the vessel used in milking is taken away and another substituted in its place, before the milking is finished, the probability is that she will *hold* her milk—that is, not allow it to flow. This is a curious property which cows possess,

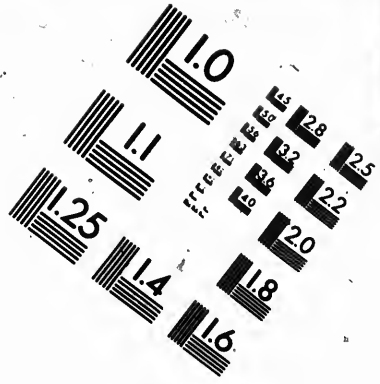
of holding up or keeping back their milk. How it is effected has never been satisfactorily ascertained; but there is no doubt of the fact that when a cow becomes irritated, or frightened from any cause, she can withhold her milk. Of course, all cows are not affected in the same degree; but, as a proof how sensitive cows generally are, it may be mentioned that very few will be milked so freely by a stranger the first time, as by one to whom they have been accustomed.

There is one side of a cow which is usually called the *milking side*—that is the cow's left side—because, somehow custom has established the practice of milking her from that side. It may have been adopted for two reasons; one, because we are accustomed to approach all the larger domesticated animals by what we call the *near side*—that is, the animal's left side—as being the most convenient one for ourselves; and the other reason may have been that, as most people are right-handed, and the common use of the right hand has made it the stronger, it is most conveniently employed in milking the hinder teats of the cow, which are often most difficult to reach on account of the position of the hind legs and the length of the hinder teats, or of the breadth of the hinder part of the udder. The near side is most commonly used in this country and in Scotland; but in many parts of England the other side is preferred. Whichever side is selected, that should uniformly be used, as cows are very sensitive to changes.

In Scotland it is a rare thing to see a cow milked by any other person than a woman, though men are very commonly employed at it in this country and in England. One never sees a man milking a cow without being impressed with the idea that he is usurping an office which does not become him; and the same thought seems to be conveyed in the terms usually applied to the person connected with cows—a dairy-*maid* implying one who milks cows, as well as performs the other duties connected with the dairy—a dairy-*man* meaning one who owns a dairy. There can be but little question that the charge of this branch of the dairy should generally be entrusted to women. They are more gentle and winning than men. The same person should milk the same cow regularly, and not change from one to another, unless there are special reasons for it.

Cows are easily rendered troublesome on being milked; and the kicks and knocks which they usually receive for their restlessness, only render them more fretful. If they cannot be overcome by kindness, thumps will never make them better. The truth is restless habits are continued in them by the treatment which they receive at first, when, most probably, they have been dragooned into submission. Their teats are tender at first; but an unfeeling, horny hand tugs at them at stripping, as if the animal had been accustomed to the operation for years. Can the creature be otherwise than uneasy? And how can she escape the wincing but by flinging out her heels?—Then hopples are placed on the hind fetlocks, to keep her heels down. The tail must





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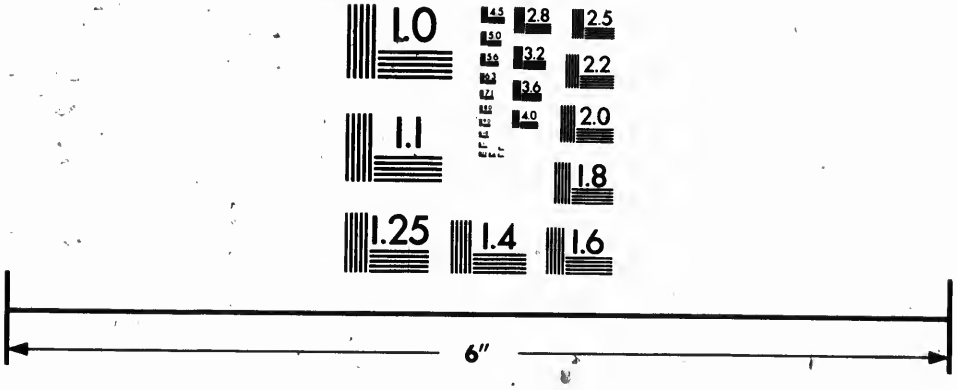

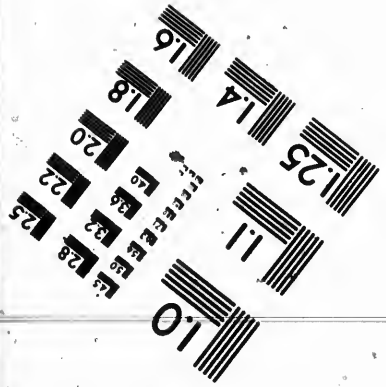

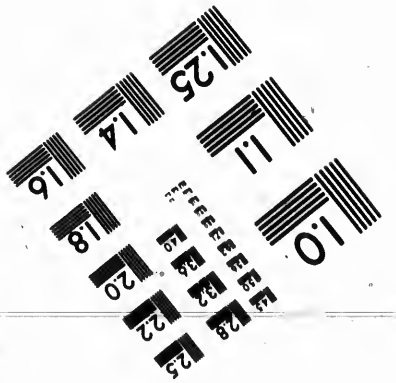

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then be held by some one, while the milking is going on; or the hair of its tuft be converted into a double cord, to tie the tail to the animal's leg. Add to this the many threats and scoldings uttered by the milker, and one gets a not very exaggerated impression of the "breaking-in."

Some cows, no doubt, are very unaccommodating and provoking; but, nevertheless, nothing but a rational course toward them, administered with gentleness, will ever render them less so. There are cows which are troublesome to milk for a few times after calving, that become quite quiet for the remainder of the season; others will kick pertinaciously at the first milking. In this last case the safest plan—instead of hoppling, which only irritates—is for the dairy-maid to thrust her head against the flank of the cow, and while standing on her feet, stretch her hands forward, get hold of the teats the best way she can, and send the milk on the ground; and in this position it is out of the power of the cow to hurt her. These ebullitions of feeling at the first milking after calving, arise either from feeling pain in a tender state of the teat, most probably from inflammation in the lining membrane of the receptacle; or they may arise from titillation of the skin of the udder and teat, which becomes the more sensible to the affection from a heat which is wearing off.

At the age of two or three years the milking glands have not become fully developed, and their largest development will depend very greatly upon the management after the first calf. Cows should have, therefore, the most milk-producing food; be treated with constant gentleness; never struck, or spoken harshly to, but coaxed and caressed; and in ninety-nine cases out of a hundred, they will grow up gentle and quiet. The hundredth had better be fatted and sent to the butcher. Harshness is worse than useless. Be the cause of irritation what it may, one thing is certain, that gentle discipline will overcome the most turbulent temper. Nothing does so much to dry a cow up, especially a young cow, as the senseless treatment to which she is too often subjected.

The longer the young cow, with her first and second calf, is made to hold out, the more surely will this habit be fixed upon her. Stop milking her four months before the next calf, and it will be difficult to make her hold out to within four or six weeks of the time of calving afterward. Induce her, if possible, by moist and succulent food, and by careful milking, to hold out even up to the time of calving, if you desire to milk her so long, and this habit will be likely to be fixed upon her for life. But do not expect to obtain the full yield of a cow the first year after calving. Some of the very best cows are slow to develop their best qualities; and no cow reaches her prime till the age of five or six years.

The extreme importance of care and attention to these points cannot be overestimated. The wild cows grazing on the plains of South America, are said to give not more than three or four quarts a day at the height of the

flow; and many an owner of large herds in Texas, it is said, has too little milk for family use, and sometimes receives his supply of butter from the New York market. There is, therefore, a constant tendency in milch cows to dry up; and it must be guarded against with special care, till the habit of yielding a large quantity, and yielding it long, becomes fixed in the young animal, when, with proper care, it may easily be kept up.

Cows, independently of their power to retain their milk in the udder, afford different degrees of pleasure in milking them, even in the quietest mood. Some yield their milk in a copious flow, with the gentlest handling that can be given them; others require great exertion to draw the milk from them even in streams no larger than a thread. The udder of the former will be found to have a soft skin and short teats; that of the latter will have a thick skin, with long rough teats. The one feels like velvet; the other is no more pleasant to the touch than untanned leather. To induce quiet and persuade the animal to give down her milk freely, it is better that she should be fed at milking time with cut feed or roots, placed within her easy reach.

If gentle and mild treatment is observed and persevered in, the operation of milking, as a general thing, appears to be a pleasure to the animal, as it undoubtedly is; but, if an opposite course is pursued—if at every restless movement, caused, perhaps, by pressing a sore teat, the animal is harshly spoken to—she will be likely to learn to kick as a habit, and it will be difficult to overcome it ever afterward.

Whatever may be the practice on other occasions, there can be no doubt that, for some weeks after calving, and in the height of the flow, cows ought if possible, to be milked regularly three times a day—at early morning, noon, and night. Every practical dairyman knows that cows thus milked give a larger quantity of milk than if milked only twice, though it may not be quite so rich; and in young cows, no doubt, it has a tendency to promote the development of the udder and milk-veins. A frequent milking stimulates an increased secretion, therefore, and ought never to be neglected in the milk dairy, either in the case of young cows, or very large milkers, at the height of the flow, which will commonly be for two or three months after calving.

There being a great difference in the quality as well as in the quantity of the milk of different cows, no dairyman should neglect to test the milk of each new addition to his dairy stock, whether it be an animal of his own raising or one brought from abroad. A lactometer—or instrument for testing the comparative richness of different species of milk—is very convenient for this purpose; but anyone can set the milk of each cow separately at first, and give it a thorough trial, when the difference will be found to be great. Economy will dictate that the cows least to the purpose should be disposed of, and their places supplied with better ones.

THE CARE OF MILK.

The system of setting milk for cream raising has, within the past few years, undergone many changes, and great improvements in the mode of handling the milk have been introduced which materially lessen the labor incident to making butter, as well as lending a valuable assistance towards insuring a uniformly better article than could be produced by the old plan. Milk set in the old-fashioned way in pans and crocks, exposed to the air of the cellar or spring house, is liable to become contaminated by absorption of all the impurities that are constantly present in the atmosphere, particularly during the hot months of summer and the fall, when vegetation passes through such rapid stages of decomposition; all foul odors of whatever nature are readily taken up and retained by milk when thus exposed to the open air. This detracts from the quality of the butter made from such milk, and no matter how great the care exercised in other directions, or how neat and cleanly the habits of the milker and the dairy maid may be, all is for nought if the surrounding atmosphere is impure, though ventilation of the milk room is an absolute necessity, and to secure this the outside air must be introduced. If the air was always pure, ventilation would be unattended with dangers, and the cream and milk could be kept in a pure and sweet condition; but when the air is loaded with tainted odors from the pig-pen, the stable, and the cesspool, or perhaps a dead carcass, undergoing decomposition, half a mile or more away, the possibilities of a fine article of butter, noted for "keeping" qualities being made from the cream so exposed, are exceedingly doubtful. There is no escape from this impure contact by the open-pan system of setting milk. The air carries with it everywhere foulness and impurities with which it comes in contact. These are rapidly and securely absorbed by milk and cream exposed to its influences, which produce decomposition and leaves a disagreeable and damaging taint to the butter that detracts greatly from its value and quality.

A dairyman may be scrupulously clean and careful of his own premises in all the details of stable, milk room, and the utensils used in the business, and to have all objectionable objects that would taint the air with unpleasant odors, removed and controlled. Yet, by the carelessness of his neighbor, arising from neglected yards and stables, his milk room may be polluted with foul and tainted air, which will inevitably, and with certainty, work disaster to high quality in his butter. Deep and cold setting by all the various plans introduced for the better production of the milk and cream, saving labor in handling the milk, and in scouring and cleaning the utensils, and for securing a better article of butter, more uniform in quality, is being gradually introduced into all well-conducted dairies with great satisfaction and success.

A few years ago it was the popular belief that the cream would not all separate from the milk unless it was spread out in a shallow vessel, and exposed to the air, and thus left for twenty-four hours or more. Milk treated in this manner in the average dairy room will generally become sour at the end of a few hours, and by the time the cream is taken off, is thick and "clobbered," and its value greatly reduced for feeding young calves, for which purpose there is no substitute that will give anything like equal returns. By the deep-setting process everything is different, and the cream can be depended to rise to the top, through a depth of eighteen inches of milk, with as much certainty as though it was but three or four inches deep; the milk may be removed at the end of twelve hours, and fed to the calves or pigs in a perfectly sweet condition. One can, as commonly used by this method, will hold as much as five or six ordinary crocks or pans, resulting in an immense saving of labor in cleansing and washing smaller vessels, the labor of skimming and consequent mixing of the upper portion of milk with the cream, and the impossibility of removing the cream entirely pure is avoided, the cans being so constructed that the milk is drawn off from under the cream through a faucet (placed at the bottom of the can) which can be shut off when the line of separation reaches that point, as shown through a glass panel placed in the side of the can; then the cream is drawn in a similar manner into another vessel.

These "creamers," as they are called, comprise many different styles and patterns, but all are constructed with a view to convenience and ease of cleanlines and purity—the common form being a box or tank for holding water, in which the cans (usually eighteen inches deep and eight inches in diameter) are placed, the proper temperature being maintained by the use of ice, or with cold water flowing through the box. The secret of the rapid separation and rise of the cream to the surface is found in the proper condition of the temperature; 44 to 45 degrees has been found to produce best results. Of course, to reduce the temperature to this point the use of ice is indispensable in summer—the same end, however, can be accomplished by employing the water from a cold well of water, or from a running stream,

when the temperature does not rise above 50 degrees. The colder the air or water at any point above freezing, to which the hot milk, fresh from the cow, is exposed, the more rapid will be the rise of cream, and the longer will the milk and cream remain sweet.

Four hours, under the best conditions, will insure a thorough separation of the cream from the milk of cows that are especially adapted to the butter-making business; in this respect milk will vary greatly, taken from the different breeds of dairy animals—that from the Jersey and Guernsey separating quickest and most thoroughly; the Ayrshire and the Holstein being larger milkers, and their milk adapted to cheese making, and being devoid of the oils in large quantities found in butter, and the butter globules being smaller, a longer time is required for the cream to rise; but, with the temperature adjusted to a proper point, the cream from any cow's milk will all be thoroughly separated at the end of twelve hours, and the milk can be given to the young animals sweet, and with a confident feeling that the butter-producing element has all been extracted.

These creamers are made of different sizes, adapted to the convenience of the family keeping but one or two cows as well as for use in dairies where a large number are kept, in either case the can system is very much superior to the old method, not only for the reasons mentioned, but because more cream can be obtained from a given quantity of milk, and from which a larger yield of butter will result; the butter will be of finer quality, and if proper precautions regarding temperature are observed will always be uniform in that quality.

It matters very little whether the cooling process to which the milk is subjected in the creamer, or placed under the water entirely, as by the Cooley process, or merely surrounded by water to the top of the cans, with ventilation through the lid, or whether the same ends are accomplished by the use of Hardin's refrigerating box (an admirable machine), constructed with a shelf across the top inside for ice, with space under to accommodate the heighth of the cans, and which receive the drippings of the melting ice—this produces the desired effect of raising the cream rapidly and thoroughly, and keeping the milk sweet by the means of cold air, instead of water—results are the same in each case—an infinite saving of labor in all the details of dairy work, better butter, with less attention and skill required in the management of the milk, and an increased amount of profit and satisfaction generally.

It has been clearly and satisfactorily proven that more butter can be made from the same amount of milk (the cream from which has been raised by the deep-setting plan) than from the shallow-pan system—numerous experiments having been authentically made and published, the balance always showing in favor of the first-named plan. This is explained partly on the

principle that cold temperature—which is always essential in deep-setting—is more conducive to the thorough separation from the milk of all substances convertible into butter, and the more rapidly this separation occurs, the more thorough it becomes. It often happens that milk in shallow pans in the open cellar or dairy-room will become soured long before the cream is all "up," caused frequently by electrical influences during a thunder-storm; this will prevent all the cream from rising, and will, of course, result in loss. Again, the cream that clings to the sides of the vessels (when allowed to stand until sour before being skimmed) aggregates in time to no inconsiderable quantity. No amount of diligence or care will get it all on every occasion. This waste is avoided by the deep-setting system, because the milk and cream being always sweet and in a thin condition, no adhesion to the cans occurs, and the cream is all saved.

In addition to the advantages gained by the deep-can system, as stated, the milk being covered, additional cleanliness is guaranteed against flies, motes, dust, etc., that are ever present in the dairy-room, and which are sure to find a lodging place upon the milk when exposed in open pans.

The Breeds of Cattle.

GROUP OF ABERDEEN-ANGUS HEIFERS.

Hillhurst Farm, Compton, Que., the home of the "black but comely" group of Paris heifers, which is very suggestive of the gregarious nature of the "Doddies," is not only one that stands without a peer in Canada, but also one that rivals the greatest in the New World. Cattle of nearly every strain have been bred in its pastures. The blood that flows in the veins of cattle bred there is the blood of the greatest prize winners in the world. Neither time nor money has been spared in bringing the farm to this acme of perfection. Cattle have gone forth from its gates to the greatest shows in America, and returned laden with the highest honors that could be conferred upon them.

Paris 3rd, the sire of the black quintette, is Mr. Cochrane's excellent breeding bull, and on whom they reflect credit. Paris 3rd was first-prize bull at the Royal Northern Show in 1881, and was purchased from Mr. McCombie by his present owner for 150 guineas. His sire, Paris (1473), was one of Mr. McCombie's famous collection at the Paris Exhibition, where he won the highest prize as a two-year-old. His dam, Proserpine, was a prize-winner herself, (by Bachelor (690); 2nd dam Black Bess of Easter Skene, by Baronet of Drumin (637). He is a stoutly-built, beefy bull of great scale and substance. The black polls are a very valuable class of beef cattle, and will at an early day be very popular among breeders of fat stock. A little time and a better knowledge of their merits is all that is necessary to guarantee the permanent popularity of the "Doddies" on this side of the ocean.

COQUETTE 4TH (3497).

The imported Aberdeen-Angus Coquette 4th is a cow that has gained a reputation upon both sides of the Atlantic, not only on account of her own merit, but that of her produce as well. Her show-yard career began in 1879, in Scotland, when she gained third prize at Banffshire Agricultural Society's Show at Banff, fourth prize at Central Banffshire Farmers' Club at Keith, and third prize as one of a pair of two-year-olds at Royal Northern Agricultural Society's Show at Aberdeen, and at same show in 1880 she was awarded third prize as one of a pair of breeding cows. In 1882 she won second prize at Banff, and second prize at the District Agricultural Association's Show at Tur-

riff. In 1883 she was awarded first prize at Strathbogie Farmers' Club at Huntley, second prize at Marnoch, first at Banff, first as one of a pair at Aberdeen, first at Turriff, and silver plate at Turriff for best Aberdeen-Angus cow and two of her progeny—the lot consisting of herself, her yearling daughter Coquette 11th (7838), which was in 1884 awarded the Smithfield Club (London) silver cup, in a class of eighty-six for best cow or heifer, open to all classes, and her bull calf Chancellor (2609), now also in possession of Messrs. Anderson & Findlay, Lake Forest, Ill. Since coming to the United States she has won several prizes, among which may be mentioned the following at State fairs in 1884: first at Iowa, first at Illinois, and first at Wisconsin. She is a regular and good breeder, her last calf, a heifer that promises to rival her own show-ring record, having already been awarded several honors, was dropped on board ship, while crossing the Atlantic, during a terrific storm, and then received the name of Cyclone from the captain of the vessel, a name which was accepted by its owners. Her calf of 1883, Chancellor (2609), already mentioned, is a magnificent animal for his age, and promises to be a valuable stock-getter. He was awarded first prize for yearlings at the Illinois State Fair, the same at the Wisconsin State Fair, and second prize at the Indiana State Fair. Coquette 4th was bred by the late Mr. Robert Walker, Montbietton, Scotland, but her present owners came into possession of her by purchase along with forty others from Mr. John Strachan, Montcoffer Mains, Banff, Scotland. The Coquette family is of Ballindalloch origin, and is spoken of as follows in Sir G. M. Grant's, Bart., private catalogue of July, 1882: "The ancestress of this family was bred at Ballindalloch in 1860, and was sired by Craigo (260), and was out of Dandy (794), a cow of the old Ballindalloch sort, and bred by the late Sir John Macpherson Grant. The Coquettes are a valuable milking race of cattle, and are allied to Southesk, Tillyfour, and the modern Ballindalloch strains.

POLLED ABERDEEN-ANGUS CATTLE.

The origin of this famous breed of beef cattle is wrapped in obscurity. None of the learned writers on the different breeds of cattle that have become famous in the British Islands, and in Great Britain especially, have been unable to trace this famous Scottish breed satisfactorily beyond a certain limit, and none of them been equal to the task of accounting for the loss of horns in the breed. Some contend that the polled cattle never had horns, but this contention is not borne out by the researches of antiquarians and naturalists, for as yet no traces have been found to prove that at any period in ancient times a hornless race of cattle existed. The opinion generally held regarding the loss of horns in the breed existing at the present time, is that it occurred in particular places spontaneously or accidently—if such a term can be applied to any of nature's freaks—and that this new feature was perpetuated by judicious breeding. There must have been some reason for preserving this peculiar characteristic of the breed, and the early history of the Galloways furnishes some light on the subject. At the time of the union of England and Scotland by the accession of James I to the British throne on the death of Queen Elizabeth, a brisk trade in cattle sprung up between the two countries. The English buyers soon showed a preference for the hornless cattle, and as they were cash customers, this naturally had the effect of encouraging the thrifty Scotch farmers to preserve and breed from the hornless specimens. The first mention on record of a polled beast was made in 1752. In an old manuscript account book belonging to Mr. J. B. Simpson, Broughty Ferry, Dundee, Scotland, the following, among other cattle

transactions, occurs: "One humble ox from James Crammond, thirty pounds Scots." The term "humble" was given to hornless cattle, Dr. Johnston, the celebrated lexicographer, thinks, for the same reason we call bees humble that wants a sting.

For the improvement and selection which has resulted in the present magnificent Aberdeen-Angus breed of cattle, we are indebted mainly to one man, the late Mr. Hugh Watson, of Keillor. It is admitted on all hands that he was to the Aberdeen-Angus breed what the Collings were to the Shorthorns. The late Mr. McCombie, Tilly-four, placed him in the first rank of those who have distinguished themselves as breeders and improvers of the "Doddies." Little is known of his method as a breeder, but he seems to have taken for his motto, "Put the best to the best, regardless of affinity or blood." He was the breeder of that remarkable animal "Old Grannie," the prima cow of the Polled Herd Book. She was the dam of no less than 25 calves, and she died at the great age of 35 years and 6 months. So successful was he in the show-ring with his "Hummilies," that at the time of his death he was in possession of over 500 awards and honors.

After him came Mr. Wm. McCombie, Tilly-four, a most wonderful man, who by his own efforts carried the Aberdeen-Angus cattle to the front, not only in the show-yards of breeding stock, but also in the market-place, as the leading beef animals or commercial beasts of his day. No other breed could for a moment compare with the north country Blackskins, exhibited every year by Mr. McCombie at the great fat stock shows and markets held in London, Birmingham, etc. He could always sell, no matter how dull the times were, and the leading butchers vied with each other to secure his choice lots. In some years he has obtained an average of $250 a head for his top lots, and he has often exceeded $220 all over. "Black Prince," his famous champion ox, came within a fraction of a ton in dead weight. He was also the breeder of the grand cow Charlotte and her invincible daughter, Pride of Aberdeen, founders of the world-renowned Pride family. In his great work, "Cattle and Cattle Breeders," there are no fewer than 17 pages occupied by a mere record of prizes won by his splendid stock. The crowning victory of his life was gained at the Paris Exhibition, 1878, when, with a grand group of his favorites, he carried off not only the $500 prize for best group of cattle in the division foreign to France, but also the $300 premium for the best group of beef-producing animals in the world. It is not generally known that one of that famous group, Witch of Endor, 3528, is the dam of the splendid bull Strathglass, purchased and imported by Prof. Brown to head the Ontario Experimental Farm herd of Aberdeen-Angus cattle at Guelph. Since Mr. McCombie's time, we may select from the numerous Aberdeen-Angus victories the following marvellous feats performed by Sir William Gordon Cumming of Altyre, and Mr. Clement Stephenson, Newcastle-on-Tyne. In 1881, Mr. Walker, factor for Sir Wm. G. Cumming, with a pair of Polls a little over two-and-a-half years old, carried off all the special prizes, as best male and female in Smithfield, and the great contest for the hundred guinea champion plate lay entirely between those two wonderful animals, the heifer being preferred. In 1883 and 1884, with *two* different animals, both Aberdeen-Angus heifers, Mr. Clement Stevenson, the great veterinary surgeon, secured the grand Birmingham trophy, the "Elkington Cup," a feat never accomplished before in the history of Smithfield.

There are illustrations of several famous specimens of this useful breed illustrated in the foregoing pages, and of whom mention has already been made. The quartette of "Blackskins," Black Judge, Mary 2nd of Knockiemill, Emma of Kinnoul Park, and Miss Charcoal, the property of Messrs. Hay & Patton, Kinnoul Park, New Lowell, Ont., are splendid specimens of the breed. Black Judge was calved Jan. 29, 1883, and bred by J. Morrison, Knockiemill, Turriff, Scotland, from whom his present owners purchased him. He was got by Jury Twin, out of Flower of Knockiemill, who was

purchased and brought to America with her calf. Black Judge began his show-yard career at the Toronto Industrial Fair in 1883, where he was awarded first prize for the best bull calf of his breed on exhibition. In 1884 he was again awarded first prize at Toronto and Collingwood. During 1885 he was awarded first medal and diploma at both London and Toronto as the best bull of any age, and besides stood at the head of the invincible five that carried to New Lowell the grand Dominion premium, and for the fourth time in succession, the championship of the Dominion.

Mary 2nd of Knockiemill is, without doubt, one of the most superb animals of the Aberdeen-Angus breed on this side of the Atlantic. She is by Black Prince of Bruckiay, out of Mary of Knockiemill, and has never been approached in the show-ring. At Toronto Industrial, 1883, she took first and sweep-stakes as the best cow of any age. At Barrie, the same year, she led the females composing the herd which carried off the grand Sweepstakes premium, competing against splendid herds of Shorthorn, Hereford and Devon cattle. At Toronto Industrial, 1884, she was again placed first, with her two stable companions second and third, in a large ring of the finest animals ever shown in Canada. In 1885 she was made "senior wrangler" of the London Grand Dominion and Provincial Exhibition, and the following week at Toronto Industrial she carried the "blue ribbon" for the third year in succession, her two stable companions being again placed second and third. She is a cow of great constitutional vigor and a splendid breeder. Her daughter, by the famous bull Chivalry, was first both at London and Toronto, and her bull calf Baron Kinnoul was deservedly the winner of the "red" at London.

Emma of Kinnoul Park is out of that grand breeder, the Flower of Knockiemill, the dam of Black Judge, and after the medal bull Chivalry. She is one of the choicest specimens in this country of an Aberdeen-Angus Poll. In 1884 she was first as a heifer calf, both at Toronto Industrial and Collingwood Exhibitions. In 1885 she walked the course, being first as a yearling at the Grand Dominion and Provincial Exhibition held in London, first the following week at Toronto Industrial, and first also at Collingwood, besides being a member of the champion herd at each of the above exhibitions.

Miss Charcoal is after Chivalry, and out of Flower of Knockiemill. She is a calf of great promise, and took second at London, and first at Toronto Industrial, 1885.

THE HOLSTEIN FRIESIAN COW, LADY FAY.

The subject of this article is one of the handsomest as well as one of the deepest milking Holstein-Friesians in America. Lady Fay 4470 was calved in March, 1879, and imported by Messrs. Smiths, Powell & Lamb, Lakeside Farm, Syracuse, N. Y., her present owners, in August, 1883. Her sire was Blokker's district bull, and her dam, Marie, has a milk record of 84½ lbs. in a day. Lady Fay gave as a five-year-old, the first season after her importation, 97 lbs. 5 oz. in one day, and 20,412 lbs. 3 oz. in one year. She won first prize at the Onondaga County, N. Y., Fair in September, 1885. At the Virginia State Fair, held at Richmond in October, 1885, she won first premium as the best cow of any age or breed; first premium in Holstein-Friesan class; second premium in class of dairy breeds, and was a member of the herd winning first herd prize. At the American Fat-Stock Show, held at Chicago in November, 1885, she won the first prize in the dairy department. Netherland Statesman 3280, a son of Lady Fay, won first prize at the Onondaga County Fair in the yearling class. He was sired by the famous bull Netherland Prince, so long at the head of the Lakeside Herd, which position

he now holds. There was in 1886 in the Lakeside Herd, three cows whose yearly records average 20,051 lbs. 7 oz., ten cows whose yearly records average 18,116 lbs. 7 1-5 oz., and twenty-six cows whose yearly records average 16,016 lbs. 1 oz. This list includes twelve mature cows, nine four-year-olds, three three-year-olds, and two two year-olds. Ten of the list are of the celebrated Aaggie family, seven of the Netherland family, two of the Ægis family, two of the Clothilde family, and five of various other strains.

IMPORTED HOLSETIN COW, EMPRESS 539.

Empress, 539, is one of the most famous imported Holstein cows in America. Her record of 19,714 lbs. 4 oz. of milk in 365 consecutive days stood at the close of 1885 at the head of all yields for a like period from imported cows of this breed. Mr. F. C. Stevens' Echo 121 has a still larger record to her credit, but is an American bred cow of Mr. Miller's raising. Empress was selected by Mr. Miller, of Peterboro, N. Y., in Holland in 1879, at which time she was eight years old, and was said to have produced 108 lbs. of milk in one day. The yearly test given her with the above result was conducted by her owner from April 17, 1883, to April 16, 1884, the cow being in her thirteenth year and permanently lame in one hind leg (from injuries received on ship board). A son of this cow, sired by Billy Boelyn, is now at the head of the Kriemhild Herd, and one of his first two-year-old heifers has given 56 lbs. of milk per day, and 12 lbs. 10 oz. of butter in seven days. The frequency of these bountiful yields from cows of this breed, and the gratifying results reaped by many dairymen with stock carrying the black-and-white blood, gives ample assurance that there is inherent merit in the breed, and in districts where the milk yield is a prime consideration they are bound to find continued favor.

THE IMPORTED HEREFORD BULLS, PRINCE EDWARD AND ROYAL 16TH.

The Hereford bull Prince Edward 7001 (6616), one of the sires in service in the herd of Mr. G. W. Henry, at Roslyn Park, Ashkum, Ill., is a son of Lord Wilton 4057 (4740), out of 7002, a Carwardine cow by De Cote 2243 (3060), and is in every way worthy of his distinguished lineage. He was bred by Mr. T. J. Carwardine, of Leominster, England, and was imported March, 1882. He has all the characteristics of the Wiltons in a remarkable degree, and is especially good in his hind quarters, a feature which is also decidedly prominent in his get. In common with nearly all the better class of Wiltons, he possesses neatness and finish along with deep flesh, rivaling in these respects the best of "The Old Bull's" get. He was shown at a number of fairs in this country the year of his importation, in his two year-old form, and won a first prize at St. Louis, first at La Fayette, Ind., second at Crawfordsville, Ind., was at the head of the first-prize Young Hereford Herd at Illinois State Fair, and also at St. Louis, and the Sweepstakes Young Herd against all breeds at Crawfordsville, Ind. When the remarkable strength of the Hereford contingent at all the above-mentioned Fairs of 1882 is borne in mind, the importance of the above-mentioned triumphs in the show ring

will be appreciated. Mr. Henry's herd is composed of about 100 individuals among which are representatives of the most popular strains such as Lord Wilton, Horace and the Longhorns, which were chosen for the foundation of as fine a herd as is known in America. Along with Prince Edward there stands Royal 16th, 6459, bred by J. B. & G. H. Green, of England, from which country he was imported by his present owner. This bull weighed, at 26 months of age, 2,010 lbs. and is a smooth, vigorous, and heavy fleshed animal.

1ST DUKE OF HILLDALE.

When Messrs. R. Huston & Son purchased the 7th Duchess of Hillhurst from Col. LeG. B. Cannon she was in calf to the celebrated Shorthorn bull 22nd Duke of Airdrie. In July, 1881, at Vermont, prior to the shipment of the cattle to their western destination, she dropped a red bull calf, which was called Duke of Hilldale, being the first of the line calved, the property of the Messrs. Huston & Son, of Hilldale Farm, Blandinsville, Ill., and is fairly shown in the foregoing illustration. He bears a close resemblance to his sire, the 22nd Duke, whose successful career as a sire fairly entitles him to rank with the 20th, 23rd, 24th, and 26th Dukes of Airdrie. His dam was a daughter of the fine cow, Airdrie Duchess 4th, said by Mr. Cochrane to have been one of the best milkers he ever owned; and her dam was that grand specimen of the breed, the old 10th Duchess of Airdrie, who bred to the age of fifteen years, and whose descendants are said to have brought their owners an aggregate of over $300,000 in the sale ring.

2ND DUKE OF HILLDALE.

The Duchess bull 2nd Duke of Hilldale, 51071, was bred by Messrs. Rigdon Huston & Son, of Hilldale Farm, Blandinsville, McDonough Co., Ill., from the 22nd Duke of Airdrie 16695, and the red cow Duchess of Overlake, one of lot of Bates-bred Shorthorns purchased from Col. LeG. B. Cannon, of Shelburne, Vt., in the summer of 1881. He was calved Jan. 24, 1883, and bought for the Forest Grove herd by Col. Moberley in the fall of 1884, at the long price of $4,000; the heifer Duchess of Hilldale (in calf to Mr. Alexander's imported 2nd Duke of Whittlebury), being purchased at the same time for $7,000. The herd into which these animals have been introduced is of comparatively recent establishment, but has already assumed high rank among the various collections of Short-horn cattle abounding in the Blue-Grass country of Kentucky.

SIR CHAMPION XIII.

The subject of this sketch, Sir Champion XIII. (320), was bred by Thos. M. Harvey, and is a son of imp. Sir Champion (30) and Worthy Beauty (295), and at a few days short of sixteen months old weighed 644 lbs. He is regarded by Guernsey breeders and fanciers generally as one of the richest and best bulls of the breed in America, and at the late Dairy Fair at Milwaukee was a prize-winner in competition with the

other famous breed of butter cattle from the Channel Islands. He was also a premium yearling at the last exhibition of the Kenosha County, (Wis.) Agricultural Society.

Among the dairy breeds the Guernsey is rapidly taking high rank, and their reputation is based upon merit of the most substantial kind. Largely through the enterprise of Messrs. Clapp and Fairbanks, Guernseys of the very highest character are being brought to America, and farmers and breeders are sure to welcome and estimate at its proper value a race which promises to do much in the way of enriching the productions of the dairy.

THE JERSEYS.

The Jerseys now take rank as amongst the most famous butter cattle in the world. The specimens illustrated in this book are members of the three most noted herds in America—that of Mr. Valancey E. Fuller, Hamilton, Ontario; Mr. George Jackson, Beech Grove, Indiana; and Mr. C. Easthope, Niles, Ohio. The Jersey cow, Mary Anne, of St. Lamberts, owned by Mr. Valancey E. Fuller, is one of the most famous butter producing cows in the world, as her record of 36 lbs. 12¼ oz. in seven days bears ample testimony to.

AYRSHIRE CATTLE.

Of this hardy breed of cattle no better specimen could have been selected than the famous cow Gurta 4th, the property of Mr. Thos. Guy, Oshawa, Ontario. She weighs nearly 1,200 lbs., has a record of 50 lbs. of milk per day, and her descendants are famous both as milkers and prize winners. Gurta 4th has been a great prize winner. She took 16 first prizes at some of the largest of our exhibitions, and two silver medals as the best female of any age. She also won the prize offered at the Toronto Industrial in 1882, for the best milch cow of any breed, milk tested as to quantity and quality.

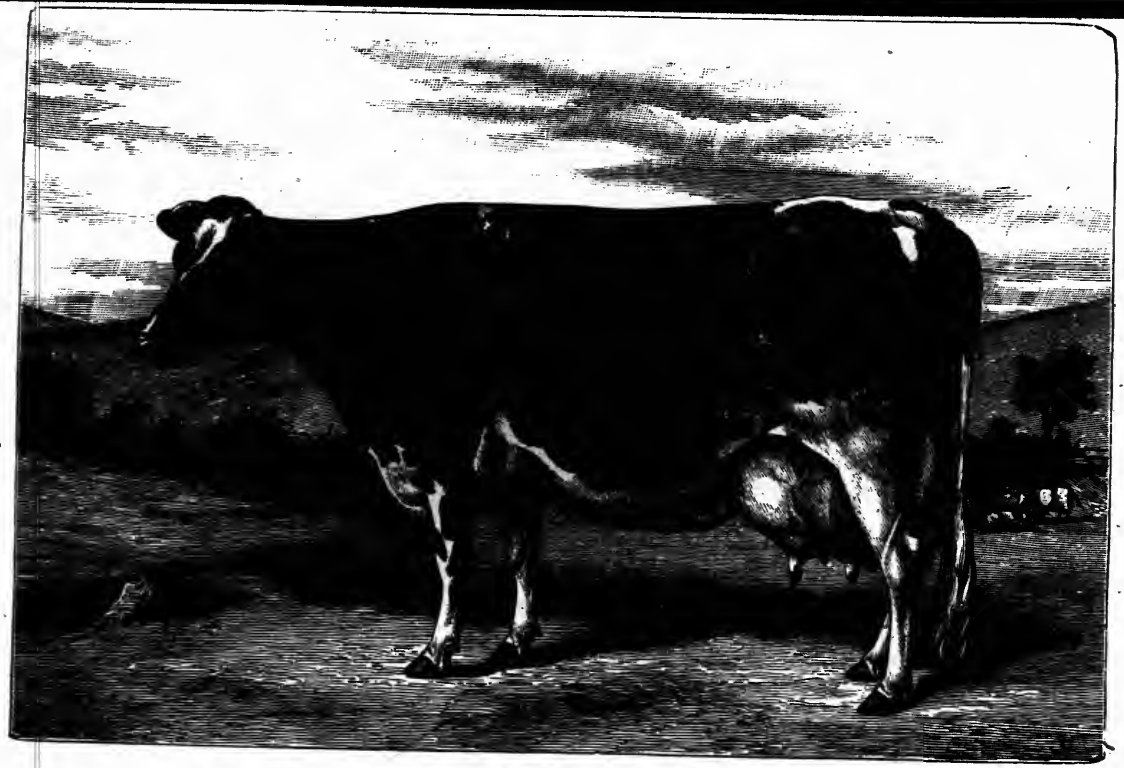
HOLSTEIN CATTLE.

Holland, the home of this breed of cattle, has for many hundred years been noted as occupying the first place in the dairy products of the world. And its cattle have been acknowledged as the most perfect for the production of milk, butter, cheese and beef combined. Holstein cows in America have produced over a hundred pounds of butter in thirty days, and there are eleven Holstein cows that produced over eighteen thousand pounds of milk in a year, and one nearly twenty-four thousand pounds in a year.

Holsteins as a breed are large, thrifty and handsome, uniformly black and white, and remarkable for their docility. The average weight of the cows is fourteen hundred pounds, and some of the bulls at three years old weigh twenty-seven hundred pounds. For beef they cannot be excelled, the fat being well distributed with the lean, and giving as much net beef to the one hundred pounds in well-fatted beef as any other breed—not losing over thirty-seven pounds to the hundred gross. The cattle illustrated in this book are from some of the best herds in America, some of which contain the heaviest milkers on the continent.

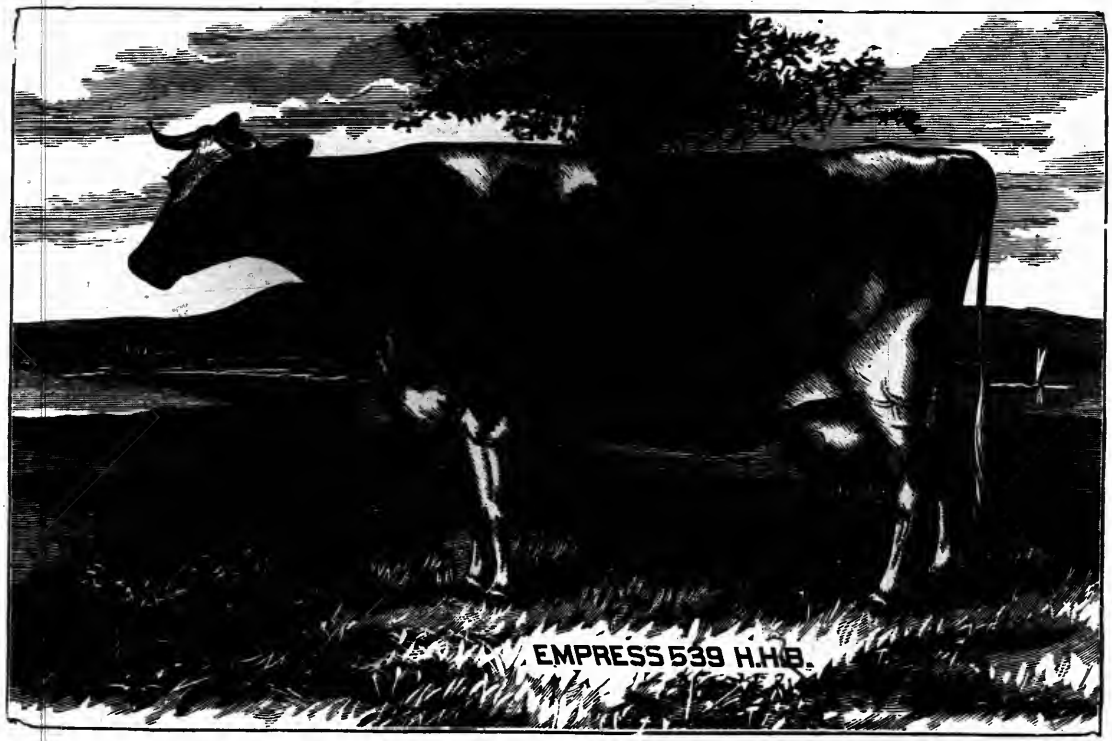
Holstein Cow (H. H. B., No. 1315), bred and owned by T. G. Yeomans & Son, Walworth, N. Y.

Imported Holstein Cow, the property of T. G. Yeomans & Son, Walworth, N. Y.

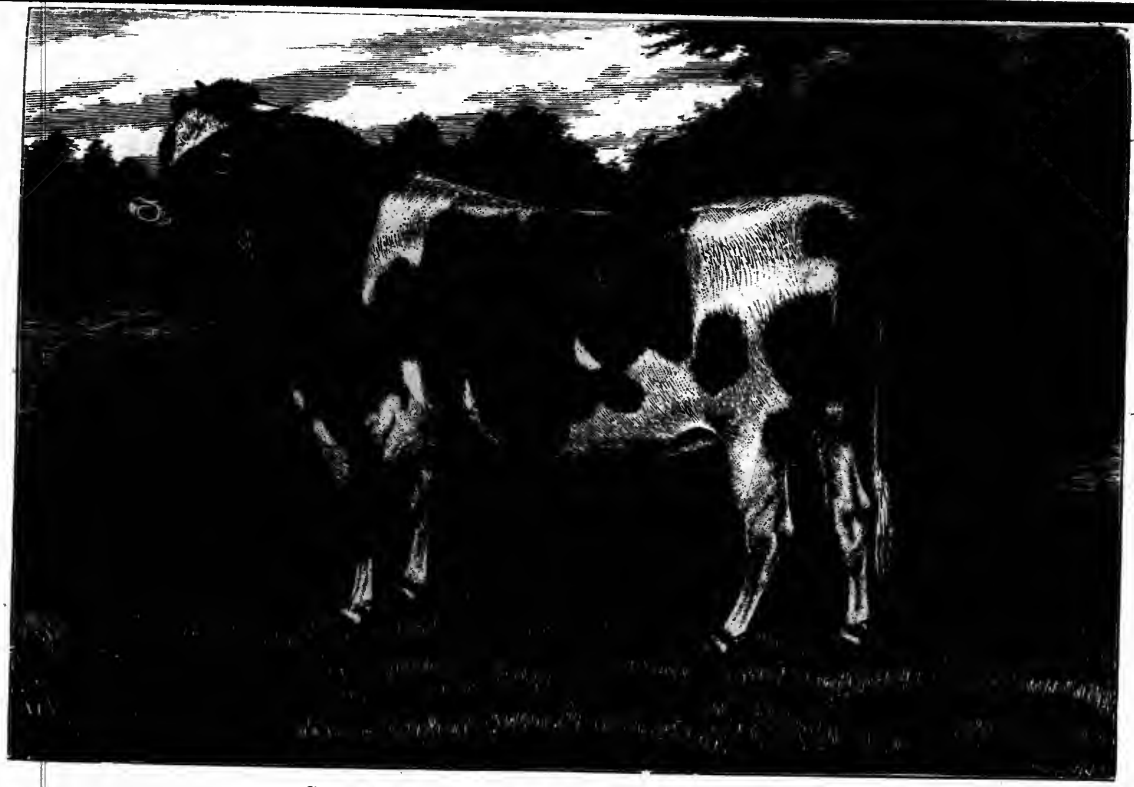


LADY FAY, 4470.

First Prize Holstein-Freisian Cow, the property of Messrs. Smiths, Powell & Lamb, Syracuse, N. Y.



Imported Holstein Cow, the property of Gerrit S. Miller, Peterboro', N. Y.

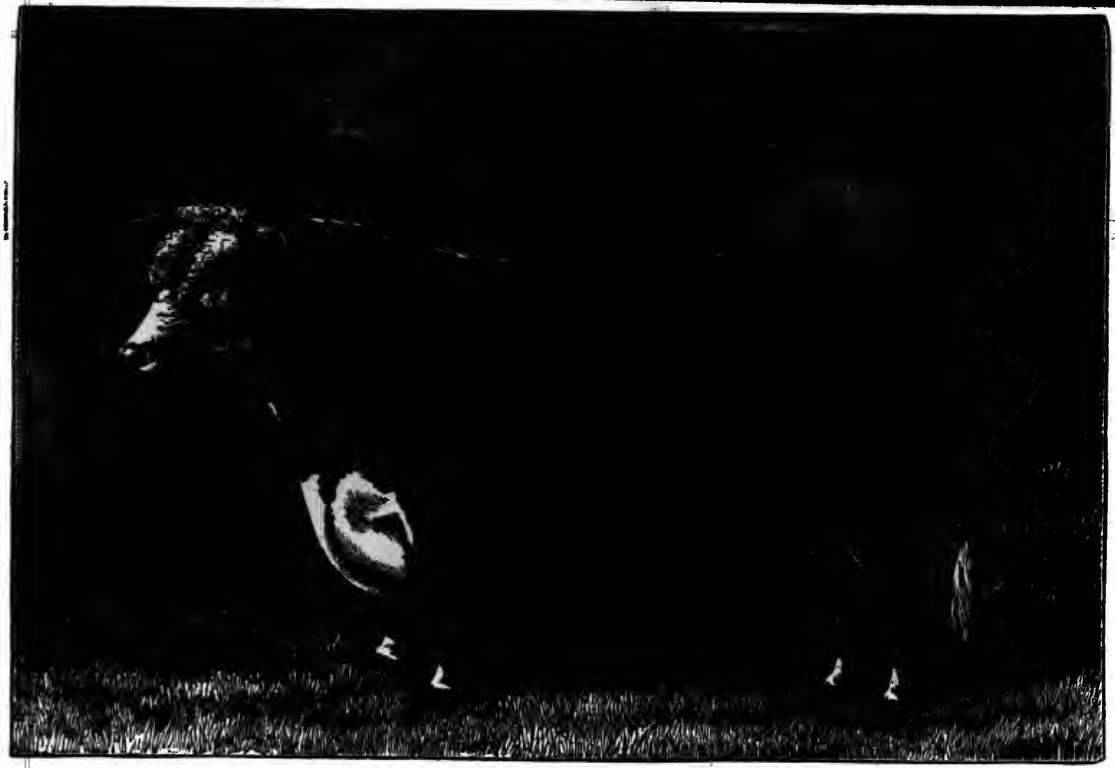


Guernsey Bull, **SIR CHAMPION XIII,** at 19 months.
Property of Messrs. N. K. Fairbanks, Chicago, and J. Clapp, Kenosha, Wisconsin.

GROUP OF YEARLING HOLSTEIN CATTLE.
The property of Messrs. Buchanan Bros., Chicago, Ill.

ROYAL E. H. B., 6655.

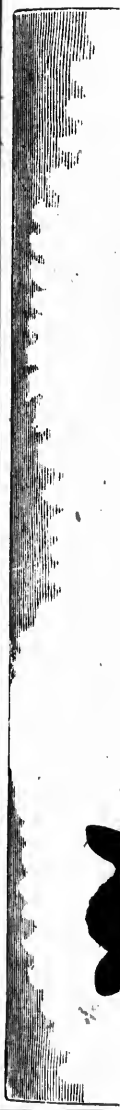
Imported Hereford Bull. Property of Mr. G. W. Henry, Chicago, Ill.

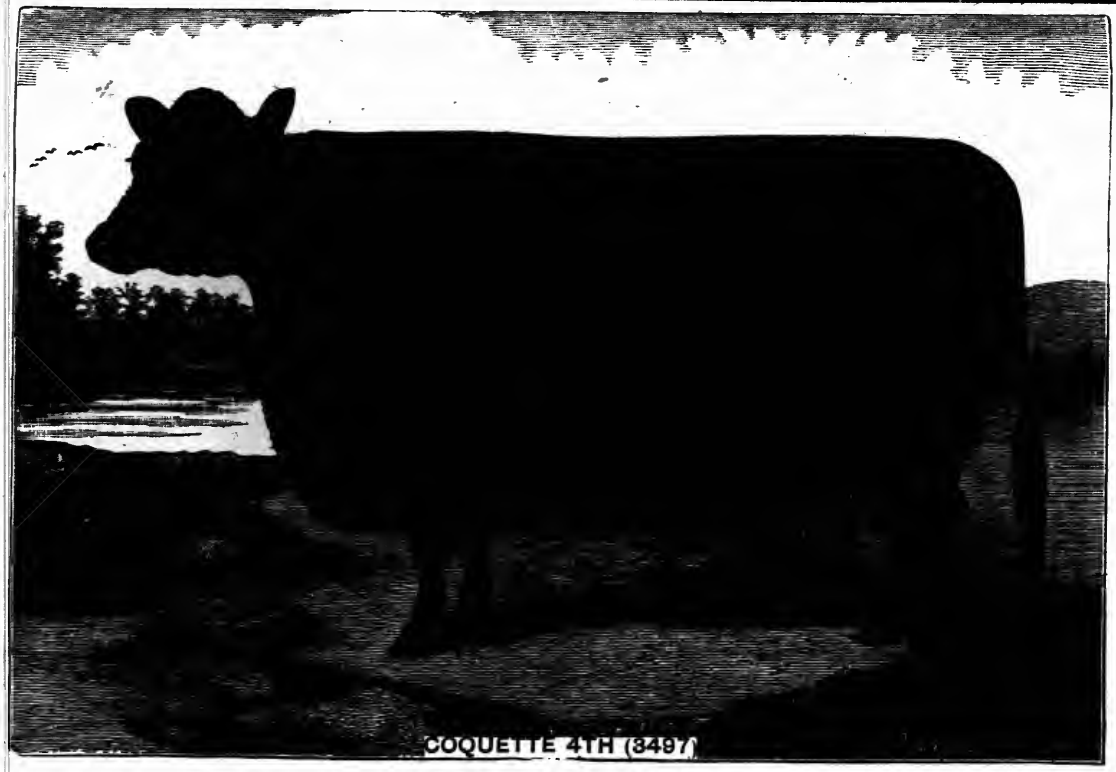


PRINCE EDWARD, 7001, (6616).
Imported Hereford Bull. Property of Mr. G. W. Henry, Chicago, Ill.

GROUP OF HEREFORD COWS.

The property of Hon. M. H. Cochrane, Hillhurst, Compton, Que.





Imported Aberdeen-Angus Cow. Property of Anderson & Findlay, Lake Forest, Ill.

GROUP OF ABERDEEN-ANGUS HEIFERS.

Property of Hon. M. H. Cochrane, Hillhurst, Compton, Que.

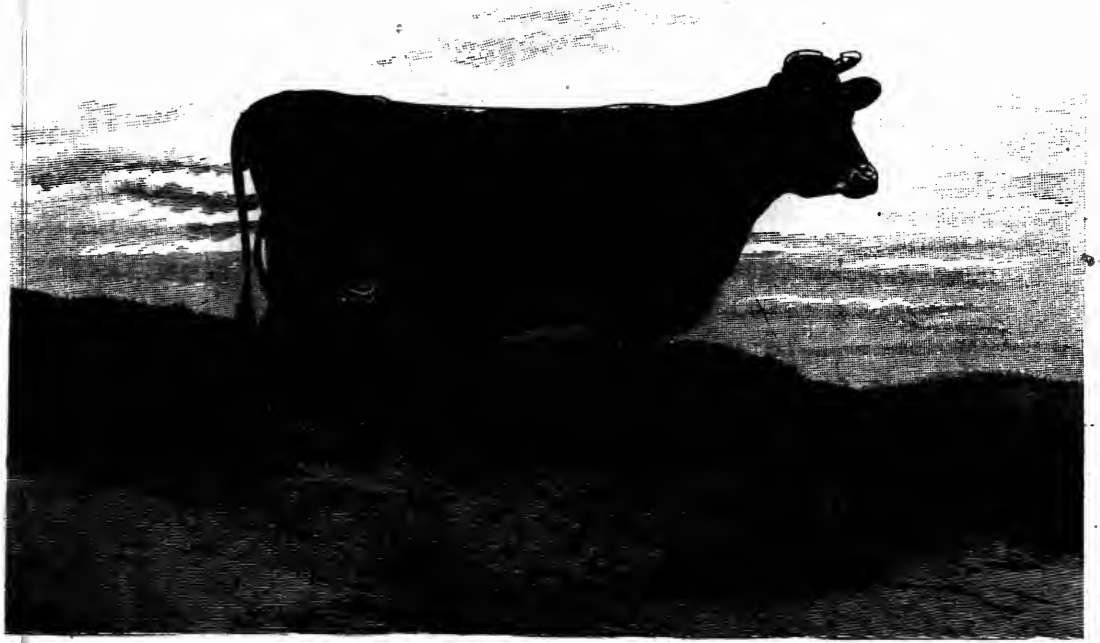
Ayrshire Prize Cow, **GURTA 4th,** (1181).
The property of Mr. T. Guy, Sydenham, Farm, Oshawa, Ont.

CLARENCE KIRKLEVINGTON.

The famous Short-horn Steer, winner of First Prize at the Fat Stock Show, Chicago, 1882. Property of the Canada West Stock Association, Brantford, Ont.

LADY ABERDEEN.

Winner of Sweepstakes, as the best Cow of any breed, at Chicago, 1882. The property of the Canada West Stock Association, Brantford, Ont.

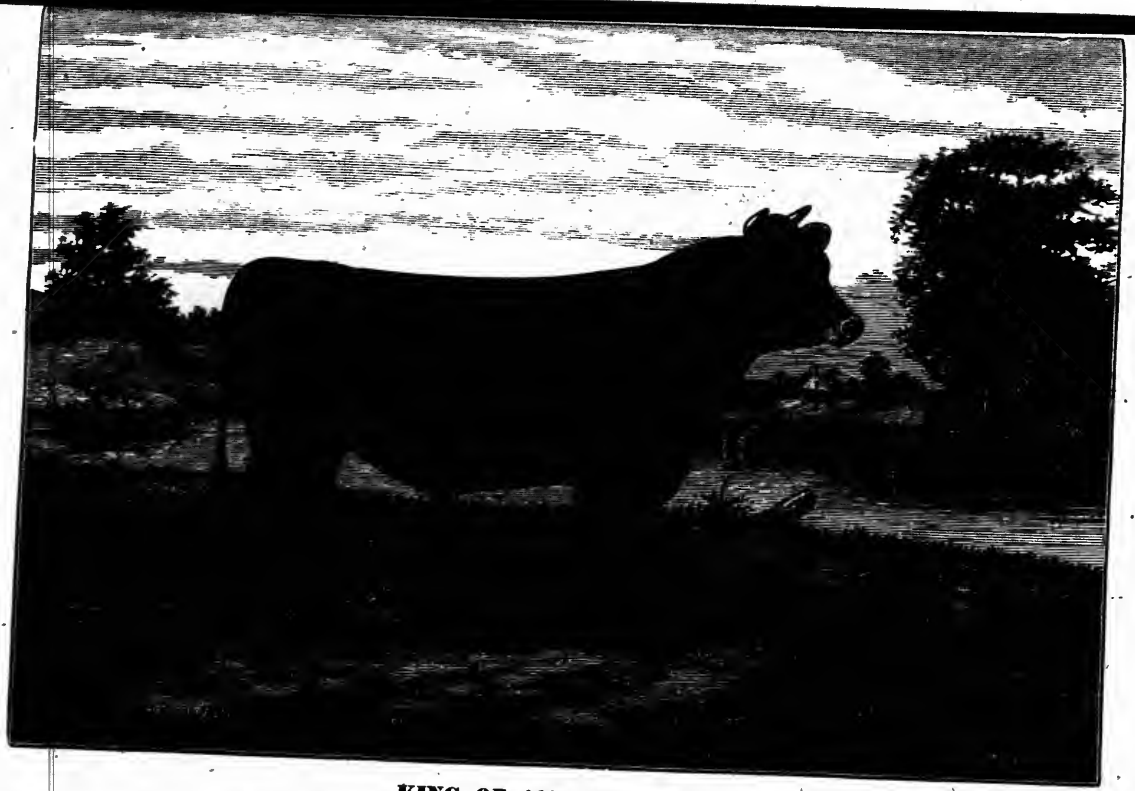


MARY ANN OF ST. LAMBERT.

(Oaklands Famous Jersey Herd). The property of Valancey E. Fuller, Esq., Hamilton, Ont.

VICTORY.

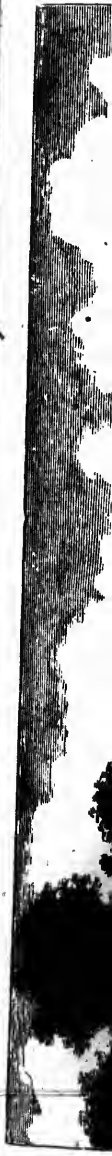
(Oaklands Famous Jersey Herd). The property of Valancey E. Fuller, Esq., Hamilton, Ont.



KING OF ASHANTEE, 6677.

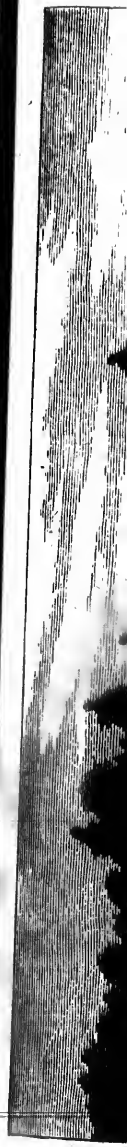
Coomassie Jersey Bull at 15 months. Property of Mr. Cornelius Easthope, Niles, O.

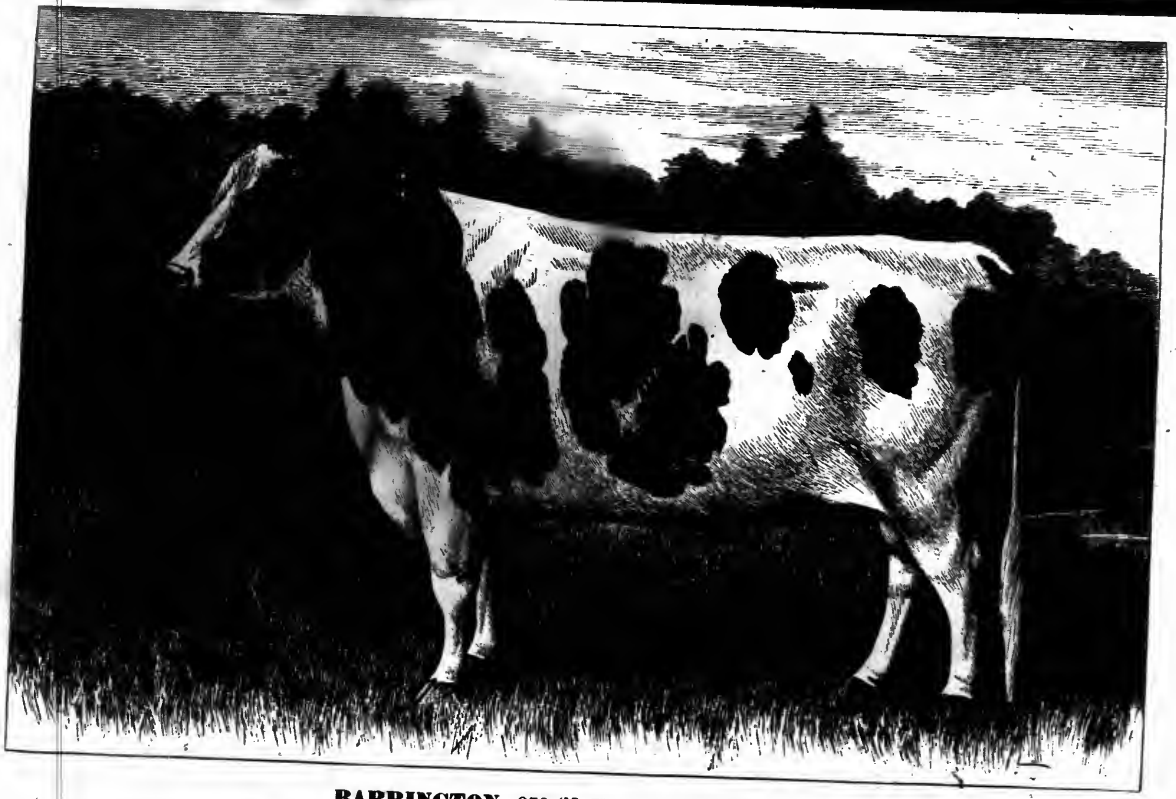
The Famous Jersey, **NANCY LEE,** 7618, and **HEIFER CALF.**
Property of Mr. Cornelius Easthope, Niles, O.



The famous Jersey Bull, **LE BROCQ'S PRIZE,** 3350.
The property of Mr. Geo. Jackson, Beech Grove, Ind.

Jersey Cow, **HAZEN'S BESS,** 7329.
Property of Mr. George Jackson, Beech Grove, Marion Co., Ind.





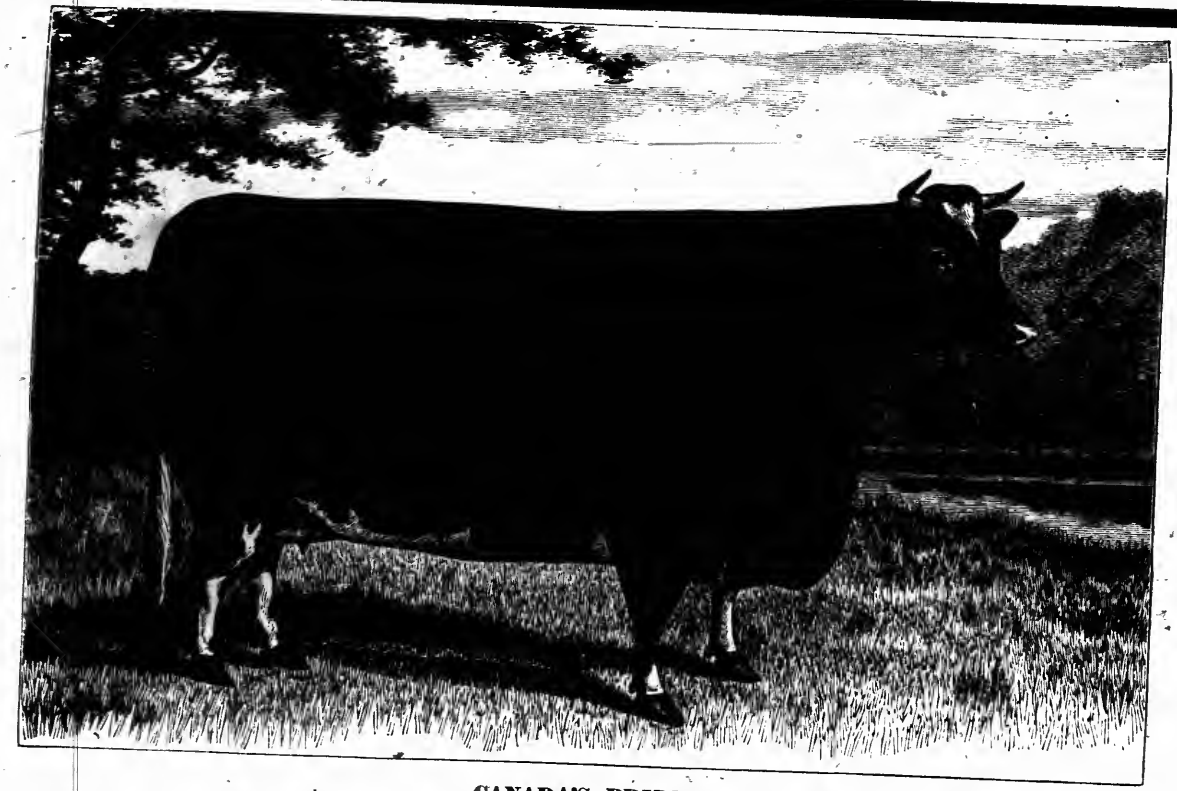
BARRINGTON, 378 (N. H. B.), 2103 (H. H. B.)
Imported Holstein Bull. Property of Messrs. B. B. Lord & Son, Sinclairville, N. Y.

CONSTANTYN, 2040.
Holstein-Friesian Bull. Property of Mr. F. C. Stevens, Albany, N. Y.

FRANCILLO, 669.

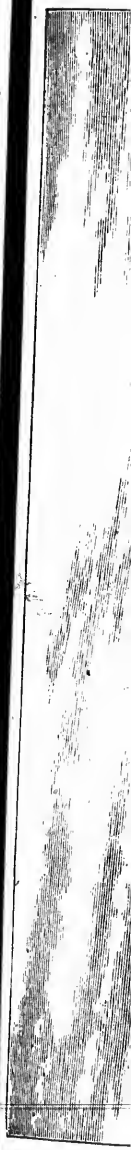
Red Polled Bull. The property of Mr. G. F. Taber, Patterson, Putnam Co., N. Y.

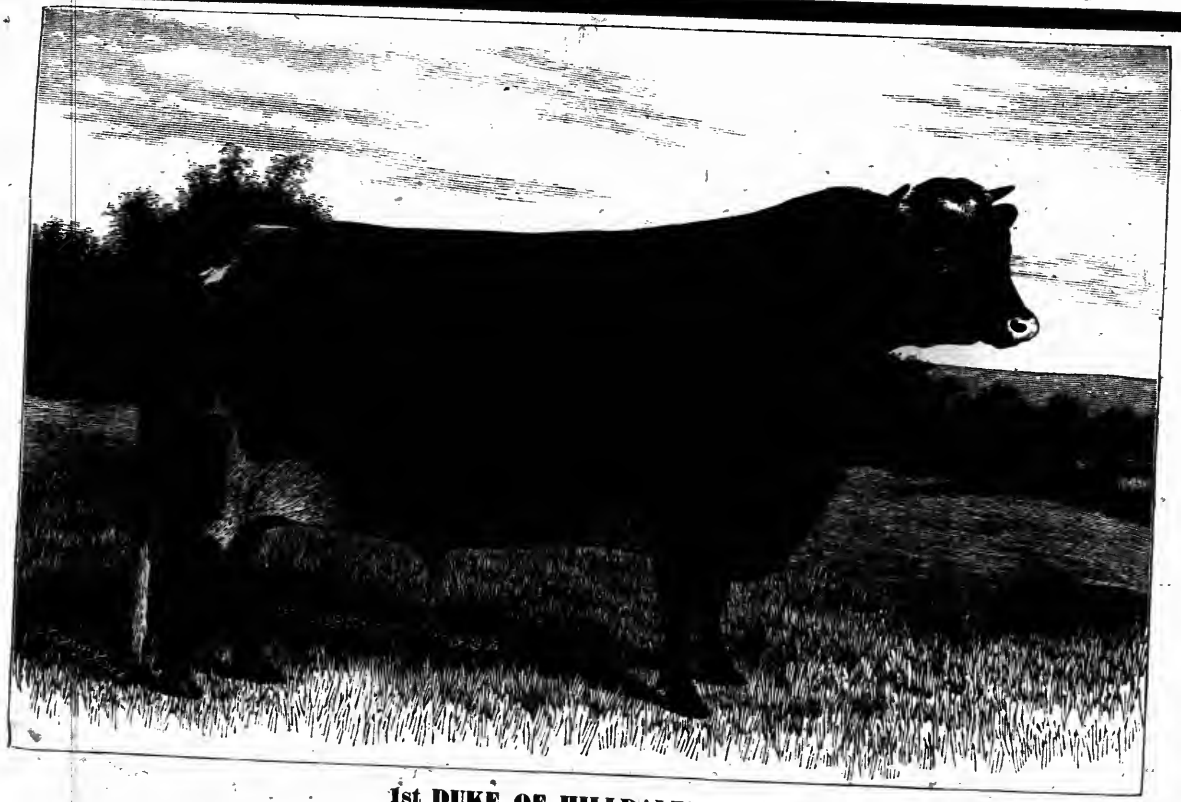
2nd DUKE OF HILLDALE, 51071.
Short-horn Bull. Property of Col. T. S. Moberley, Richmond, Ky.



CANADA'S PRIDE.

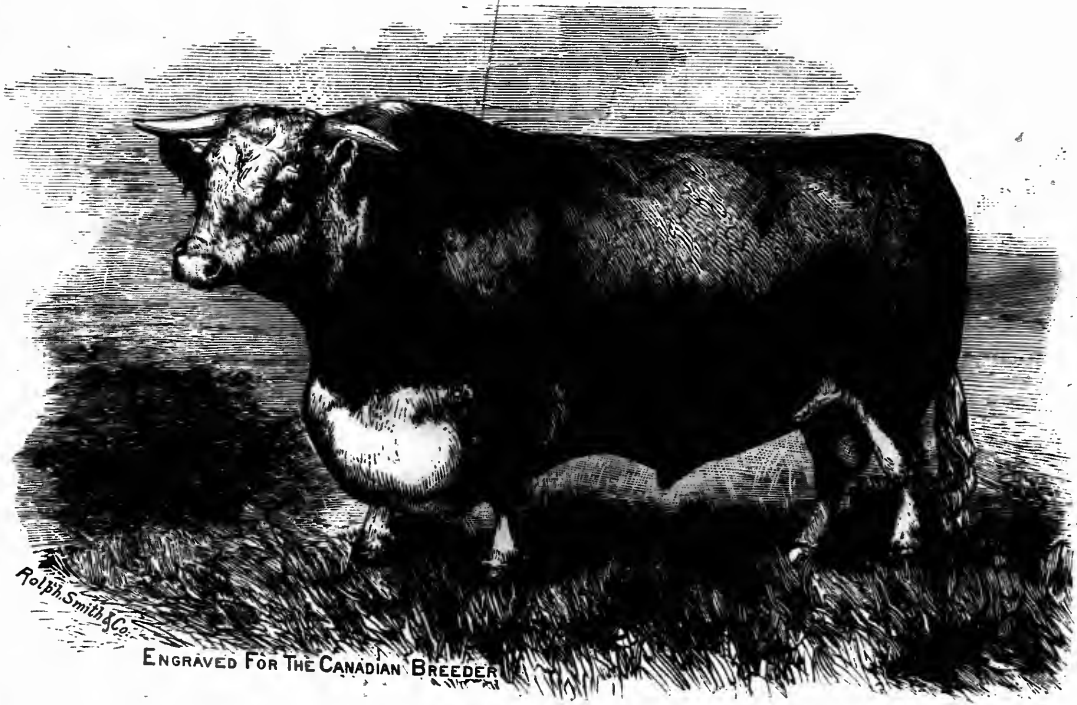
A celebrated Short-horn Heifer. Property of the Canada West Stock Association, Brantford, Ont.





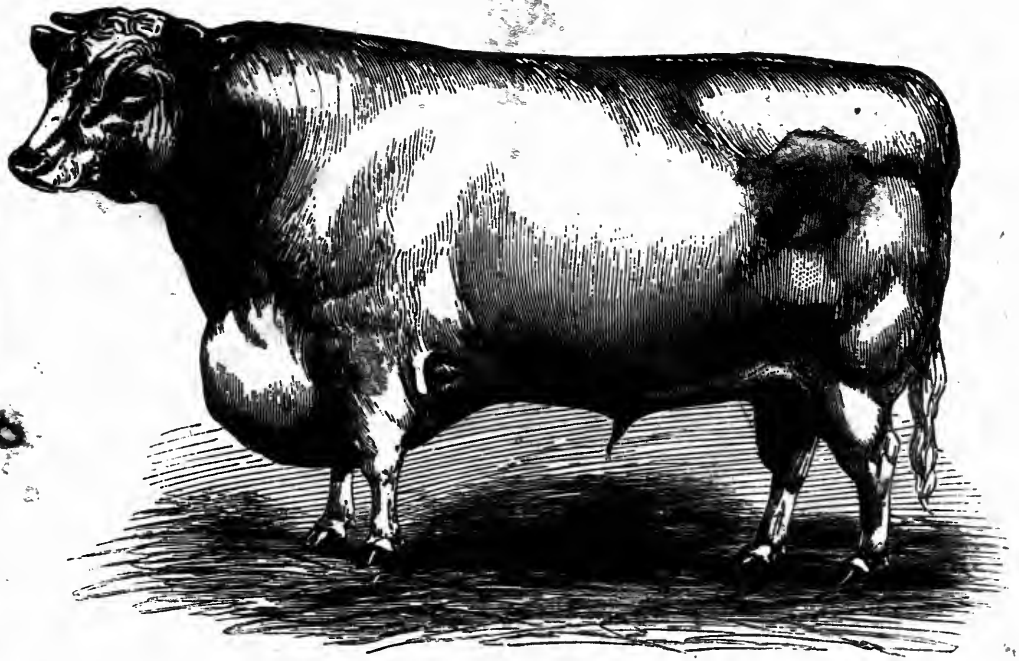
1st **DUKE OF HILLDALE,** 43429.

Property of Messrs. Rigdon Huston & Son, Blandinsville, Ill.



ARCHIBALD, 6290.

Champion Hereford Bull. Winner of First Prize at the Royal Show, Shrewsbury, England, in 1884.



EARL OF OXFORD.

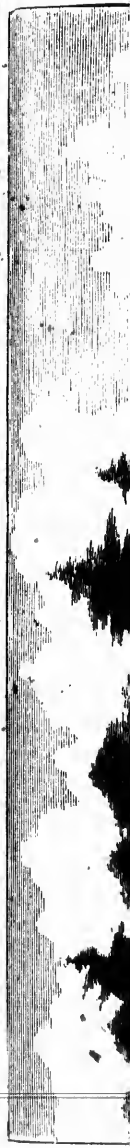
A celebrated Short-horn Bull. Winner of 1st Prize in the all-aged Bull class, at the Bath and West of England's Society Show at Brighton, in June, 1885. Property of Mr. W. Chapman, Gerran, Grampound Road, Cornwall, England.

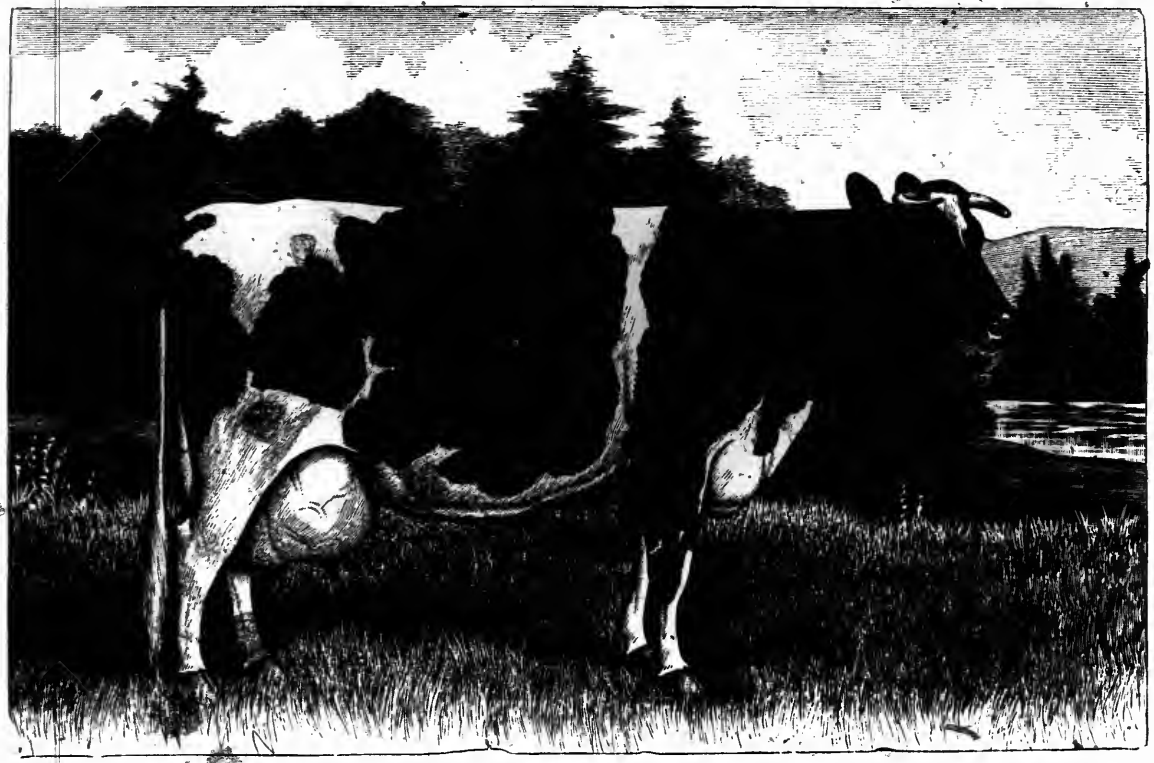
JUSTICE, 1426.

Champion Polled Aberdeen-Angus Bull. Winner of the Champion Prize at the Highland Society's Centenary Show, Edinburgh, Scotland, in 1884.

LADY, (5379).

Imported Hereford Cow. Property of B. Herskey, Muscatine, Ia.



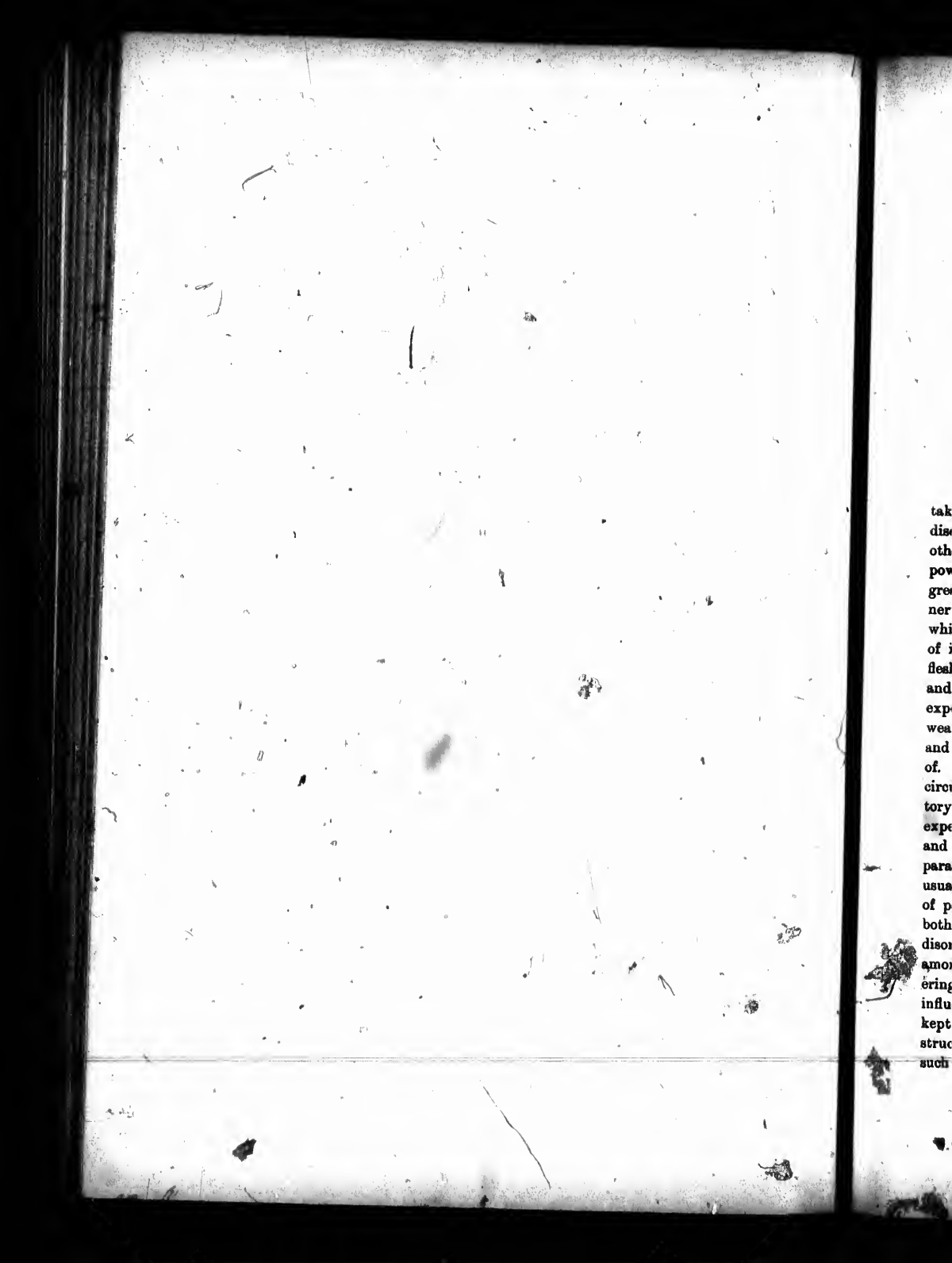


HAMMING.

A celebrated Holstein Cow. Property of Messrs. B. B. Lord & Son, Sinclairville, N. Y.

GROUP OF ABERDEEN-ANGUS POLLED CATTLE.

No. 1, Black Judge; No. 2, Mary 2nd of Knockiemill; No. 3, Emma of Kinnoul Park; No. 4, Miss Charcoal. Property of Messrs. Hay & Paton, Kinnoul Park Stock Farm, New Lowell, Ont.



The Diseases of Sheep.

In judging of the symptoms of disease in the sheep, it is necessary to take into account the nature, constitution, and habits of this animal. The diseases of the sheep are numerous and more generally fatal than those of other domestic animals. The digestive organs of the sheep are largely and powerfully developed, and its capacity for the production of blood is very great. Yet its needs for this large supply of blood is not to support its nervous system, which is feebly developed, nor its muscular exertion, of which it is incapable to any great extent, nor its circulation, which is only of inferior amount, but the surplus must necessarily go to the production of flesh, fat, and wool. In the sheep, therefore, the production of flesh, fat, and wool is the chief of its functions, and the greater part of its vitality is expended in this way, leaving but a small amount to sustain the comparatively weak vascular system. The sheep is unable to sustain severe muscular labour; and slow movement, except for very limited periods, is all that it is capable of. From the small brain development of the sheep, its weak nervous and circulating system, it is to a great extent free from diseases of an inflammatory character. From the large exercise of its digestive powers, it is to be expected that diseases of the digestive organs should be frequent and serious, and this we find to be the case. From the same causes that render it comparatively free from diseases of an irritating character, it with more than usual readiness succumbs to those in which debility and the exhaustive effects of parasites are the chief features. Indeed, it is to the attacks of parasites, both external and internal, that sheep owe their most troublesome and fatal disorders. Infectious or contagious diseases have greater scope for action amongst sheep than amongst other domestic animals, by reason of their gathering together in large flocks, and thus being more exposed to unwholesome influences than those animals which are usually kept singly, or which, when kept in large numbers, naturally break up into small separate herds. The structure of the foot, and the manner of the growth of the crust and sole, are such as to subject it to disease in that organ from which other animals are

free. In the management of a flock of sheep it is necessary to bear in mind the peculiarities and habits, so that the watchful care of the shepherd may be given as far as possible to exercise precautions which may prevent disease. Fortunately our climate is so well adapted to these peculiarities and habits that our flocks suffer from far fewer diseases than those of other less favourable climates, and at present many diseases prevalent in other countries are unknown to us except by report. Precautions, to be effective, must be intelligently exercised, and it is only by thoroughly understanding his flock that the shepherd can know what to avoid and what to do. The symptoms which indicate approaching disease should be instantly recognized, or the threatened danger cannot be averted. Then the timely remedy may be employed, which is rarely ineffective, while that which comes later is rarely serviceable or effective. The remedies to be administered must be consistent with the peculiarities of the sheep. Possessing but a weak vascular and nervous system, and a small supply of circulating blood, bleeding is rarely called for, and can be employed only with danger of doing harm in place of good. For the same reason tonic and stimulating medicines are more frequently needed, and may be given in larger doses. Purgatives, especially saline ones, for the same reason, always demand an accompanying stimulant.

Purgatives are frequently called for, as the digestive organs so abundantly developed and largely exercised are readily diseased or disordered, and disturbance of the system rarely occurs without sympathetically or otherwise involving those organs. The veterinarian used to study the diseases of the horse, and to apply his reasoning to the peculiarities of that animal, is too apt to lose sight of the vast surface of the stomachs of the sheep, the insensibility of much of this surface, and the fact that medicine administered with the food or in solid form will most probably fall into the rumen, where it will be ineffective. So, too, the shepherd, who consults veterinary works, will be misled to a great extent, and be induced to believe the too common idea that it is folly to physic a sheep, and the best treatment is to cut its throat at once. In treating sheep, purgatives are useful to reduce fever, to lower inflammation, and to restore tone to the stomach and liver. They should always be given in a liquid form. Of all the purgatives, Epsom salts and linseed oil (always raw) are the most suitable and effective. The action of stimulants given along with a purgative is always beneficial.

Stimulants, of which ginger, gentian, aniseed, and peppermint oil are the most usual and useful, restore the tone of the stomachs and excite them to action, thus aiding in the operation of the purgative, which might otherwise still further enfeeble them.

Bleeding, when it is necessary in the outset of inflammatory disorders

or local excitements, should be performed by operating on the veins under the eye or the ear; the inside of the forearm is a convenient place; when a large quantity is to be taken, the jugular vein of the neck may be opened by first cutting off some of the wool, pressing the vein with the finger, and cutting it lengthwise—*never crosswise*—with a sharp lancet. Never less than two ounces or a wine-glassful should be taken, and rarely more than half a pint.

In referring to the diseases hereinafter treated of, as far as possible the causes to which they may generally be attributed, with the means of prevention, will be given. The remedies mentioned will be those to be given to a full-grown animal, for lambs, one-half or less of the doses should be given, and for very young lambs still less should be given.

The most prolific causes of disease are over-feeding, under-feeding, irregularity of feeding, want of water, drinking impure water, impure air, damp, and over-driving. If these were avoided there would be but little complaint of the frequent troubles, difficulties, and losses in keeping sheep. While they exist, medicine, at the best, is but a temporary expedient, effective only during the time in which extra care is used. When this care is allowed to relapse the trouble will infallibly recur.

Catarrh is very common during the fall, winter, and spring. It will be found on close observation to be rarely absent in any flock. In our dry climate, subject, however, to sudden changes of temperature, catarrh, or cold, is mostly due to exposure to damp in open yards, or to too high a temperature in sheds or pens, rather than to exposure to the weather in open fields. Flocks that are more carefully tended and housed than usual, are found to be more subject to it than others. Of two flocks equally well fed, but one of which is carefully shut up every night and protected (?) from every draft of fresh air, and another whose bed is the snow in an open, airy, dry yard, it will be the first that will be troubled with cough and discharge from the nose, while the latter will be free from it. Fresh air, ample ventilation in partly open sheds, dry yards, and clean, dry bedding, and protection from chilling rainstorms in winter, with whatever protection may be needed immediately after shearing, should the weather be cold and rainy, will generally be amply sufficient to prevent any trouble from this complaint. Chasing by dogs and consequent over-heating, and over-driving, are certain causes, and these should be carefully avoided. The judgment of the shepherd should be exercised in exceptional cases, acting always under the general rule that dry cold is rarely hurtful to sheep, while they suffer from wet or damp cold, and that moist, warm, steamy, close atmosphere, especially when confined in stables, will inevitably produce cold or catarrh, which if not at once remedied will generally result in serious disorders of the lungs. This disease consists of inflam-

mation of the lining membrane of the throat, windpipe, nostrils, and the sinuses of the head. It produces an increase of the secretion of mucus and consequent irritation and coughing. When long continued the cough becomes dry and deep-seated, showing that the lungs are involved.

The treatment consists in removal of the causes, good nursing, administering slightly warm mucilaginous drinks, as oatmeal gruel or linseed tea, along with a gentle stimulant, such as half a teaspoonful of ground ginger. The antiseptic effect of a small quantity of clean pine tar rubbed upon the sheep's nose, some of which the animal will lick off and swallow, will be beneficial. If there is fever, and the nose is dry and hot, the following may be given, viz. :

Epsom Salts	½ ounce
Saltpetre	1 dram
Ground Ginger	1 dram.

This should be mixed with molasses and placed on the back part of the tongue with a long, narrow-bladed wooden knife or spatula. The animal's head should be held up until the whole is swallowed in repeated small quantities. Or the dose may be mixed with thin gruel, and administered by means of a small horn.

Bronchitis is simply a deep-seated catarrh which affects the bronchial tubes or air passages in the body of the lungs. It is dangerous, inasmuch as the inflammation readily spreads and affects the lungs. In bronchitis the cough is more severe than in catarrh, the pulse and the respiration are both quickened, there is some fever, and the appetite fails. The treatment is the same as that prescribed for catarrh, but to be continued longer, changing the dose to the following, to be administered for three or four days, reducing the quantity of saltpetre gradually one-half.

Linseed Oil	1 ounce
Saltpetre	1 dram
Powdered Gentian	1 dram.

Bleeding must not be attempted in this disease. Quietness is indispensable, and a clean, airy, but solitary, pen should be provided, and plenty of pure, fresh water supplied.

Pneumonia, or Inflammation of the Lungs.—This is a more frequent disease than is generally suspected. Many sheep exhibit the peculiar symptoms of pneumonia, and are too far gone for recovery before their too careless owners are aware that they are affected. High-bred imported sheep, the Leicester more particularly, are very liable to this disease, which is generally fatal to them. It consists of inflammation of the substance of the lungs, and frequently follows neglected attacks of bronchitis, the inflammation easily and quickly passing from the lining membrane of the air-passages to the cellular tissue of the lungs. Washing in streams of cold spring water, or

sudden chills from exposure to cold showers, quickly succeeding hot weather, or when heated with driving, or after shearing, or too close penning in warm stables in cold weather, are the usual causes. It is rarely that this disease develops fully without previously passing through the earlier stages, or without some serious mistake in the management of the sheep; and it is only by instant attention and proper treatment that its usually rapid and fatal course can be arrested.

The symptoms are a quick and laboured breathing, with painful heaving of the flanks; a painful cough; discharge of thick yellow mucus from the nostrils, high fever, and great thirst; hard, quick pulse; constant grinding of the teeth, together with loss of appetite and rumination. On examination after death the lungs are found to be hard and gorged with blood, and if thrown into water they sink to the bottom. The disease usually terminates in death in from twenty-four to thirty-six hours.

Treatment is of no avail unless commenced immediately. Bleeding from the jugular vein, until the animal staggers, is the first and most effective remedy. If found necessary, this should be repeated in six hours. Two ounces of Epsom salts should be given immediately after the bleeding; if this does not cause free purging, one ounce more may be given in three hours. Copious purging is not to be dreaded in this disease with sheep as with the horse. Injections of thin oatmeal gruel, strained, should be given every two hours. After the bowels have been well evacuated, the following may be given twice a day in oatmeal or linseed gruel:

Powdered Digitalis	1 scruple
Nitrate of Potash	1 dram
Tarter Emetic	1 scruple

to be continued several days. As soon as the sheep improves and begins to move about, a pint of gruel may be given every three hours with half a dram of powdered gentian. Warm drinks of dissolved gum arabic, or linseed meal tea, in which a little honey is dissolved, will be useful. The nostrils should be freed from accumulated mucus by washing or sponging with a mixture of equal parts vinegar and water, or of one ounce of acetic acid with a quart of water. Some of the acidulated water should be squeezed into the nostrils to clear them as far as possible.

One dram doses of tartar emetic alone have been given with benefit in this disease. As it is in nearly every case avoidable by proper care and precaution, and is rarely cured when once well seated, it will be far by the best policy to prevent its occurrence.

Pleurisy, or inflammation of the membrane covering the lungs and the lining of the cavity of the chest, is produced by the same causes as pneumonia. It frequently accompanies this latter disease. It most frequently follows the careless washing of sheep or their exposure to cold winds with wet fleeces, or

from a severe chill after having been sheared. After an attack of this disease, and a seeming recovery, an adhesion of the lungs to the sides of the chest often takes place which prevents the sheep from thriving and keeps them in poor condition, from which they cannot be recovered. Widespread causes, chiefly those arising from the unfavourable condition of the weather, sometimes affect the flocks of extensive districts, and lead to the supposition that the disease is epizoötic or contagious. This, however, is not the case.

Prevention consists in watchful care to protect the sheep from sudden change of the weather at a time when they are more than usually exposed to its ill effects; also from a too sudden change from housing to open pasturing in the spring. All sudden changes in the management of sheep should be made with caution, a change, even from poor to rich feed, may produce this or other inflammatory diseases, and care must be exercised in this respect.

The symptoms are similar to those of inflammation of the lungs; more pain is experienced, and the sheep exhibits more distress, sometimes moaning in agony. After death, the cavity of the chest is found filled with fluid; the surface of the lungs is highly inflamed, and covered with livid patches, but their substance is not affected. Generally no trace of disease is found elsewhere.

The treatment consists of copious bleeding as for pneumonia, but more blood may be taken with benefit. The following may be given:

℞ Powdered Digitalis ..... 1 scruple.
Nitrate of Potash ..... 1 dram.
Nitrous Ether (Spirits of Nitre) ..... 2 drams.

to be administered in linseed-meal or oatmeal gruel twice a day for four or five days. When recovery begins, the following tonic may be substituted:

Sulphate of Iron ..... ½ dram.
Infusion of Quassia or Cinchona ..... ½ pint.
Ground Ginger ..... ½ dram.

Choking.—Sheep are not often troubled with obstructions of the gullet, except when fed upon cut or sliced turnips, or permitted to consume the shells of turnips which have been scooped out by them in the field. When a sheep is thus choked, the head is held down, saliva flows from the mouth, breathing is difficult, and the stomach becomes distended with gas, or air swallowed in the efforts to dislodge the obstruction. When this occurs, the sheep's head should be raised and held firmly between one man's legs, while another pours a teaspoonful of linseed-oil or melted lard down the throat, and endeavours, by gently manipulating the gullet, to work the obstruction downwards. If this is ineffectual, a probang should be used. This is a flexible thin rod, as the wash-rod of a rifle, or a piece of light rattan or other tough, elastic material. A soft ball of tow, or of strips of linen cloth, is *securely* fastened to the end of the rod. This is well soaked with sweet oil or lard, and gently inserted into the gullet until it meets the obstruction, when it is forced

downwards without violence, a few gentle, but smart taps on the upper end with a light stick being generally more effective than continuous pressure. If the lining of the gullet is injured in the operation, and the sheep refuses to eat, gruel or other liquid food should be given until the soreness disappears. If the obstruction cannot be removed in this way, the sheep had better be slaughtered. If it is a valuable animal, an effort, which is frequently successful, may be made to save it by cutting open the skin and the gullet upon the obstruction, and removing it. The opening in the gullet is then closed by a stitch made with a surgeon's curved needle, and the wound in the skin closed separately in the same manner. The sheep should be securely held during this operation. Soft food should be given until the wound is healed. (See Treatment of Wounds.)

Costiveness—Stretches.—This complaint is more frequently a symptom of disease than a disease itself. Yet it frequently occurs when changing the flock from pasture to dry food. The dung then becomes dry, hard, and scanty, and is discharged irregularly. The termination of the bowel is red and inflamed, and when voiding dung, the sheep grunts or moans as with pain. Care in changing the food is a preventive, and a few ounces of linseed-cake meal daily will obviate the difficulty. Injections of warm soap and water, or of one ounce of linseed oil, will relieve the bowels, and one ounce of linseed oil given by the mouth will generally bring about a cure.

When the costiveness is of long continuance, from neglect, the sheep may be perceived stretching itself, spreading the feet apart, raising the head, curving the back, and extending the abdomen. This may also occur from obstruction of the bowels, which, however, is rare with sheep, but is most frequently caused by costiveness. A teaspoonful of sublimed sulphur (flowers of sulphur), mixed with a small quantity of molasses or lard, may be placed on the tongue to be swallowed, once a day, for a week. A regular allowance of a mixture of four ounces of sulphur with one pound of salt, placed where the sheep can have access to it at will, is a sure preventive of costiveness.

Diarrhœa, or Scours. A looseness of the bowels, without pain, fever, or other complications, frequently occurs when sheep are turned to pasture in the spring, or turned on to rich, succulent green food, as clover, rape or turnips. It is sometimes perceived when they are exposed to the hot sun in early spring without shelter. It is not dangerous of itself, but as the disease very quickly interferes with the process of nutrition, the blood is soon affected, and the more serious blood-disorder, dysentery, supervenes. Diarrhœa may generally be prevented by careful regulation of the food, and avoiding sudden changes, and the regular supply of salt. It is quickly subject to proper treatment, which consists of the administration of astrin-

gents and cordial preparations. The following mixture should always be kept on hand by the shepherd, ready for instant use:

Prepared Chalk	1 ounce
" Catechu	4 drams
" Ginger	2 drams
" Opium	½ dram

to be mixed with half a pint of peppermint water and bottled for use. Two large tablespoonfuls of this is given night and morning to a sheep, and half as much to a lamb, always previously shaking the mixture well. Cottonseed-cake meal is both an excellent preventive and remedy for this complaint, and a supply should be kept for use. Half a pound a day should be given to a sheep.

If any mucus or glutinous substance appears in the dung it is a proof of the existence of irritating matter in the intestines, and a laxative should be given previously to the above. This may be

Linseed Oil	2 ounces
Powdered Ginger	1 dram

or

Epsom Salts	1 ounce
Ginger	½ dram
Gentian	½ dram

to be given in infusion of linseed-meal.

Hoven, or distension of the rumen, is not uncommon in sheep. It consists in the formation of gas in the first stomach, or rumen, by which it is so much distended as to press injuriously upon the diaphragm or membrane which encloses the chest. This, preventing the contraction of the diaphragm, interferes with the respiration. It appears as an enlargement of the left side of the abdomen, by which the skin is tightly drawn until in apparent danger of bursting. It is caused by the rapid fermentation in the stomach of very succulent green food, which has been greedily swallowed while wet with dew or rain. The stomach may at the time be disordered, and its digestive powers impaired; or the distension may be produced by other diseases of which it is an attendant or a symptom. In such a case it indicates a decrease or chemical change of the alkaline secretions of the rumen. The treatment should be immediate, lest suffocation ensue. An alkaline fluid poured into the rumen frequently alleviates the symptoms and removes the trouble. This may be

Ammonia Water *(Aqua Ammoniæ)*	1 teaspoonful
Water	½ pint

to be administered through a horn. A hollow, flexible probang, which should be kept for this purpose, may be inserted through the gullet into the rumen, by which a means of escape for the gas may be made. The alkaline liquid mentioned may be poured into the stomach through the tube of the probang, or an opening may be made through the flank into the rumen with

the trochar and canula, or by a small-bladed knife. This opening should be cautiously made at the spot where the greatest swelling is found. In the latter case a quill should be inserted into the hole to allow the gas to escape. If the passage be stopped by solid matter, a wire may be put through the quill to restore the opening. The ammoniacal liquid previously mentioned, or a solution of a teaspoonful carbonate of soda in quarter of a pint of water may be injected through the quill with a common syringe. Afterwards the following may be given with the horn:

Epsom Salts	2 ounces
Ginger	1 dram
Water	1 pint.

If the production of gas still continues, a dram of chloride of lime dissolved in water will tend to remove the gases generated by the now decomposing food.

Where none of these appliances are at hand, the following substitutes may be used, viz.: flour, lard, and salt, to form a ball, mixed with one dram of carbonate of ammonia, at the early stage, or one dram of chloride of lime at the later stage. Small balls of this mixture to be placed on the root of the tongue, or into the gullet, so that they may be swallowed. Sulphuric ether is sometimes given in doses of two drams each in cold water; it is a valuable stimulant and antispasmodic when the animal becomes rigid or convulsed.

The after treatment should be tonic, and the food should be light and not bulky. Bran or oatmeal, scalded and well salted, and given with one dram of ginger would be useful. The return to copious green food should be gradual, until the stomach has regained its tone.

Poisoning.—At certain seasons sheep are tempted to devour injurious herbs or plants. St. John's wort, when frequent in pastures, produces sore mouth and irritation of the intestines, which quickly disappear when the sheep are removed to a more wholesome pasture. The sheep-laurel, lambkill, or narrow-leaved kalmia, is eaten by sheep which have access to it at certain seasons, chiefly during the winter and spring, and is often fatal to them. The symptoms of poisoning are disinclination to move, frothing at the mouth and nose, lessened pulse, staggering gait, and bloodshot eyes. Immediate attention should be given, as death generally occurs within twelve hours. To dilute the mess of poisonous food, and to expel it from the system as soon as possible is the proper treatment. This may be done by giving two ounces of Epsom salts in a pint of warm water, and repeating the dose of water without the salts in an hour. Injections of warm soapsuds will help to remove the injurious matter from the bowels. To prevent the danger of poisoning by carefully removing all injurious plants from the pastures or

fences around them would be the obvious duty of the careful shepherd. The large-leaved laurel *(Kalmia latifolia)*, is also eaten occasionally by sheep. In England, the yew tree, which is common in hedges, causes the loss of hundreds of sheep every year. Sheep should not be allowed to feed on pastures which have been dressed with gypsum, lime, soot, or any chemical fertilizer until after one or two copious showers have washed the herbage clean.

Inflammation of the Bowels.—This disease (the *braxy* of the English shepherds) is not frequently met with in this country, except as an adjunct to some complicated inflammatory blood disease. It, however, sometimes occurs as the result of continued indigestion, or the consequence of feeding upon dry, innutritious pasture, combined with bad water in hot weather. The first symptoms are weeping and redness of the eyes, weakness and staggering, loss of appetite and rumination, inaction of the bowels, swelling of the flanks, high fever and difficult breathing, a puckering up appearance of the mouth and nostrils, which gives a peculiar woe-begone and pained expression to the face; a tight skin and rapid emaciation. After death, the stomach is found filled with putrid food, and distended with gas; the bowels are gangrenous and in a state of decomposition; the liver is partly decomposed and filled with degenerated bile; the spleen is gorged with blood, softened, enlarged, and not unfrequently ruptured, ulcerated, and exhibiting a seriously diseased condition. The latter appearance seems to identify this complicated and fatal disease with the splenic apoplexy or Texan or Spanish fever of cattle. Death is often very sudden, many sheep left in apparent health at night being found dead in the morning; at the most, two or three days is the usual course of this disease.

To prevent it, when circumstances favour its appearance, an abundant supply of pure water and a change of pasture should be provided. Low grounds should be avoided, and everything done that can ameliorate the circumstances of privation in which the flock may be temporarily placed. It is not epizootic, and the removal of the causes will prevent the spread of the disease. A supply of salt, mixed with one per cent. each of sulphate of iron, ginger, and gentian, to be given every evening to the sheep on their return from pasture, will be a useful preventive. The treatment should consist of bleeding from the jugular vein at the first appearance of the disease. Bleeding from the vein on the abdomen has also been practised with success. Mild aperients—an ounce of linseed or castor oil or Epsom salts—are useful, and should be followed by twice daily doses of one dram of *sulphite* (not sulphate) of soda. The food should be liquid and demulcent, such as oatmeal-gruel, infusions of linseed or solutions of gum arabic. Except the animal is a very valuable one, it will be hardly worth while to attempt a cure in a case of serious character, as the recovery is slow, and the following debility is of itself often fatal, after a costly and protracted course of treatment.

Foreign Bodies in the Stomach.—Sheep are sometimes observed to purposely swallow earth in small quantities. In pasturing green fodder crops or roots, much earth, and sometimes small stones, are swallowed. In eating hay, or other dry fodder, foreign matter, such as nails, pieces of wire, or glass, will sometimes find their way into the stomachs. All these matters cause much irritation, and sometimes death. The trouble is shown by a suspension of the appetite, the sheep lag behind the rest, stand for long periods without moving, grind their teeth, poking out the nose, and depressing the ears. When the flank is pressed, a grunt of pain is heard, and there is violent purging. When these symptoms are observed, and the sheep are known to have been in danger of swallowing any of these substances, this cause may be suspected.

The only treatment that can be of use is to give daily doses of one ounce of Epsom salts, and feed scalded bran or cornmeal in the shape of thick mush in order to remove the foreign matter with the food if possible. If this will not be taken, oatmeal or cornmeal gruel should be given copiously with the horn.

Balls of wool and earthy matter are sometimes found after death in the stomachs. These are gathered by the sheep nibbling themselves when irritated by lice, ticks, or scab. Generally they exist without suspicion of their presence until death occurs, and in many cases without known ill effect on the animal. It would be safe to avoid possible danger in this direction by keeping the flock, especially the lambs, free from parasitical and irritating insects.

Congestion of the Liver.—When sheep are highly fed upon stimulating food, and have but little or no exercise, the liver is apt to become gorged with blood. This fulness of blood is termed congestion. It is occasioned by disordered digestion, and when it exists to a serious extent occasions further complications of this important organ. It produces constipation, dulness and a yellowish tinge of the eyes. As soon as this latter sign appears there should be no delay lest inflammation supervene.

The treatment consists in giving an active purge, to be repeated every morning until the bowels are in their usual healthy condition, the yellowness of the eyes has disappeared, and the appetite has returned. The purge may be the following, given in molasses placed upon the tongue:

Epsom Salts	1 ounce
Calomel	3 grains.

The patient should be supplied with slightly warm drink soon after swallowing the medicine.

Inflammation of the Liver.—By neglect, the disease last mentioned may result in inflammation of the liver. When this happens the

system becomes fevered; the nose and mouth hot and dry; the breath fetid; the ears cold; the eyes pale and glassy; the pulse is irregular; breathing is slow, and the expirations short and sudden; the dung is dry, hard, black, and glazed with a greasy, yellowish-green mucus; the urine is highly coloured, scanty, hot, and smells disagreeably. Pressure on the right side, near the short ribs, produces pain, and the animal moans.

The treatment consists of purgatives and injections. For a purgative, the following may be given twice a day in infusion of linseed, or gum arabic or in molasses, well mixed together and placed on the tongue:

Sulphate of Potash	2 drams
Calomel	5 grains
Powdered Opium	1 grain.

Injections of warm water and Castile soap may be given until the bowels act freely.

When improvement occurs, and the appetite returns, great care in feeding should be observed, and only the most easily digested food should be given. Pulped sugar beet, scalded clover-hay chaff, linseedmeal, boiled malt, or sifted cornmeal, may be given with linseed tea for drink, or water acidulated with a few drops of aromatic sulphuric acid.

Diseases of the Blood.—The blood, being the very foundation of the life of the animal, must exist in a state of purity, or the vital functions are at once disordered. Anything, therefore, that vitiates the blood or unfits it for the proper performance of those functions which have been already explained, produces what is known as blood diseases, or diseases originating in and communicated to various organs by the blood. These may be classified as follows:

1. Diseases arising from an impaired, increased, or arrested function, or process, viz.: rheumatism, plethora, anæmia, scrofula, dropsy.

2. Diseases called *enzoötic* because arising from animal poisons, originating either within the subject, or communicated by the same poisons originating in other animals, viz.: influenza, dysentery, red-water, heaving or after pains, navel-ill in lambs, black-leg, or quarter-ill or anthrax fever.

3. Diseases arising from animal poisons of unknown origin, and which are highly contagious, and freely communicated from one subject to another, and hence called *epizoötic* diseases, viz.: epizoötic aphtha, small-pox.

Fortunately, these diseases, so fatal in their operation, and so uncontrollable in their course, are easily prevented by proper precaution and ordinary hygienic or sanitary measures. Also in the salt, sulphite of soda, we have a valuable remedy against these ferments which are the active agents in the majority of blood diseases.

Rheumatism.—This disease is attended with considerable fever, constitutional disturbance, and the presence of acid matters in the blood. It

affects the serous membrane, as the coverings of the joints, the substance of the tendons and ligaments, the enveloping membranes of the heart, lungs, spinal marrow, bones, muscles, and the brain. As it has a disposition to change its locality almost instantaneously, and to pass from one joint to another, or one part to another (a process known as *metastatis*), and affects all these important parts of the body, the seriousness of the disease is evident. It consists in a peculiar inflammation of the parts affected which causes acute pain when they are called into action. When it passes from the acute to the chronic state, it causes serious changes in the structure of the joints affected. Its symptoms are general uneasiness and stiffness, a diminished or capricious appetite, and, sometimes, suspended rumination. The dung is hard and scanty, and the urine is high-coloured and deficient in quantity. One of the joints is found hot and swollen; in an hour or two this is relieved, and another is found affected. It generally attacks in spring those animals which have been half starved or exposed to cold or damp during the winter. Rams, which have been overworked the previous season, are often affected. Young ewes are rarely troubled with it. If not remedied by proper treatment, the animal suffers from continued fever, general prostration, severe pain and emaciation, and eventually dies miserably. The treatment consists of a moderate purgative at first, such as:

Epsom Salts	2 ounces
Spirit of Nitrous Ether	4 drams
Ginger	1 dram

to be followed by

Sulphate of Potash	2 drams
Sulphuric Acid	20 drops
Water	½ pint

to be given dissolved in water night and morning. Protection from cold and damp, and soft, laxative food are required. Linseedmeal, either solid or made into gruel, is a useful addition to the food. As this disease is apt to become chronic, the patient should be fitted for the butcher as soon as possible. A rheumatic ram will beget rheumatic lambs.

Plethora consists in a too rapid production of blood, by which the system is engorged, and important organs become congested. It is caused by over-feeding with rich albuminous food, and is counteracted by a simple purgative, or bleeding from a vein on the face or the jugular. Its effects appear in a flushed condition of the visible membranes, laboured breathing, staggering and sleepiness. It never occurs except in animals in high condition, such as those prepared for exhibition, and which in case of over-fatigue, or excessively hot and damp weather, suffer greatly, and sometimes fatally, from engorgement of the vessels of the lungs or brain or both.

Anæmia or Pining.—This term, "the bloodless condition," indicates the nature of the disease. There is a condition to which sheep may be brought

by the effects of dysentery, or by parasites in the lungs or intestines, which much resembles this disease. But there is an abnormal state of the blood caused by imperfect nutrition, which is in itself a disease, and not a symptom. When from continued wet weather the pasture becomes rank and watery, the flock appears at first in an excellent and thrifty state, but in a few days the animals are found lying listless, with drooping heads and ears, watery eyes, and the expression of the face miserable and painful. A few days afterwards the skin is tightly drawn, the wool becomes of a peculiar bluish cast, the skin beneath of a pearly white colour, the eyes are also of a pearly bloodless appearance, and death is busy in the flock. On dry, rich clover pastures the same effects are sometimes experienced. The disease never appears on steep, rocky hillsides, where the pasturage is short and sweet, nor on those pastures which are scant, but yet nutritious, and intermixed with coarse herbage; nor on lands that are abundantly supplied with lime. It is impossible to know beforehand whether the pasture will produce this effect or not, as it seems most probable that the geological character of the soil has most to do with it. But when once a farm, a pasture, or a field, is found to induce this ailment, sheepkeeping may be abandoned upon it, unless the flock can be immediately changed to some other part of it where it will thrive.

Scrofula—Tuberculosis.—This disease is almost surely fatal in course of time, although at first the sheep subject to it may be brought, by proper treatment, into condition for the butcher. It is a question, however, if the flesh of scrofulous animals can be safely consumed as food, but yet many such go yearly to the butchers to be thus disposed of. It would certainly seem that the use of such animals as food should be carefully avoided, and the sale of their flesh prevented as injurious to the public health, for no taint is more readily conveyed to the system than scrofula. It is supposed to consist of a diseased condition of the blood, by which the lymph, or white, serous, uncoloured portion of it is unfitted to nourish properly the tissues of the body and to be built up into organized matter. Lest the accumulation of this imperfect blood should embarrass the system, it is deposited in various parts where it is productive of least inconvenience, and the nutrition of the body goes on, as well as it may, with the remainder of the blood thus separated from the useless and injurious portion. But it is frequently the case that there is not sufficient left to supply the waste of the tissues, and a gradual falling off in condition occurs. The symptoms of "consumption," a very significant term, as the chief organs are slowly consumed, then appear. The pulsations of the heart are loud, so as to be heard on applying the ear to the ribs; the pulse is feeble, the appetite irregular, and a slight cough exists, caused by the efforts to throw off the accumulating and offending matter from the lungs. In time, the glands of the body become loaded with the deposited

matter; those of the throat and neck, the parotid and submaxillary, being most commonly and extensively affected, and greatly swollen. The symptoms gradually increase in intensity, and there is much fever and emaciation, with discharge from the nose and eyes. The skin is tight and pale, and the body appears almost free from blood, as in anæmia. At this period there is no help for the animal, for death is only a question of time.

The treatment in the earlier stages is to administer some of the preparations of iodine, such as the following:

Iodide of Potassium ..... 5 grains

or

Iodide of Iron. ..... 10 grains

to be finely powdered and mixed with molasses, and placed on the root of the tongue, so that it is swallowed. The above dose to be given daily. The latter preparation is to be preferred. The swellings may be rubbed daily with iodine ointment. No scrofulous animal should be used for breeding, as the disease is hereditary. High-bred sheep are the most subject to this disease, and "in-and-in breeding" tends greatly to produce it

In some localities an enlargement of the glands of the neck, similar to the disease known as *goitre* in mankind, is frequent amongst sheep. This is supposed, doubtless with reason, to be caused by the water drank, as in such cases the removal of the flock to distant pastures has led to the disappearance of the disease. The occurrence of the symptoms above described, however, will be sufficient to indicate the true character of scrofula as distinguished from any accidental swelling of the glands.

Dropsy consists in the effusion of a watery or serous fluid in the abdomen. It is accompanied with inflammation of the lining membrane of the abdomen, the peritoneum, from which the fluid is secreted; it is caused by feeding upon rank, succulent, watery, herbage, by which the blood is insufficiently nourished. A change to dry food, or scanty but more nutritious pasture, alleviates the disease at once. A cure is generally effected by the use of diuretics, aperients, and tonics. The treatment will be the administering of the following, or such others as may produce the desired effect:

Nitrate of Potash..... 1 dram
Sulphate of Soda..... 1 ounce
Ginger..... 1 dram.

If the animal is in low condition, the sulphate of soda may be replaced by the following, viz:

Linseed Oil ..... 2 ounces.

Inzootic Diseases—Influenza.—This disease, being due to causes which occur over an extended locality, is liable to affect a large number of animals at the same time. It is erroneously supposed to be infectious. It consists of inflammation of the nasal and bronchial passages, considerable

fever, and great prostration, with general disturbance of the system. There is redness and weeping of the eyes, running at the nose, cough, great weakness, loss of appetite, indigestion, with impaction and sometimes hoven, or distension of the rumen. It is prevalent after continued cold and damp weather, and is most severe where the ground is low and undrained, or in river bottoms or valleys, where morning and evening mists abound. When these conditions occur, the flock should be kept on high, dry ground, or in dry, sheltered yards, and carefully protected. Their food should be somewhat improved, linseed oil cake or cornmeal, buckwheat, oats, or rye, being added. A dose of the mixed salt and sulphur, (one quart of salt with four ounces of sulphur) should be given, and any ailing sheep should be well nursed and treated to warm gruel. These precautions will generally prevent a serious attack.

The treatment, when the disease becomes severe, is to give a light dose of some saline purgative, such as

Epsom Salts	½ ounce
Ginger	1 dram

a quarter of a pint of water, or mixed with molasses or honey. For a ge flock the medicine may be mixed in bulk in proper proportions, and a arter of a pint given to each sheep by means of a horn. Those more eriously affected should receive the following, viz.:

Tincture of Aconite	10 drops
Solution of Acetate of Ammonia	1 ounce

to be given every four to six hours, decreasing the aconite at each dose until five drops only are given, when it may be suspended, and only repeated in an emergency.

If the eyes are much inflamed, they should be washed with a solution of one grain of sulphate of zinc, and twenty drops of laudanum, in one ounce of water. After recovery the feed should be laxative and nutritious; bran mashes and boiled oats, or cornmeal mush, with a little powdered ginger or gentian and a pinch of powdered blue vitriol (sulphate of copper) in each mess, would be useful. If not readily taken in the food, this tonic may be given for a few days in honey or molasses. Shelter is absolutely necessary during treatment and recovery.

Dysentery may be distinguished from diarrhœa by its more severe symptoms, there being much fever; the dung is mixed with blood and mucus, has a fetid smell, is discharged frequently, and is generally in hard lumps and scanty; it is also voided with pain, and the sheep arches its back and moans in its passages. The wool feels harsh, and after a short time may be pulled off in handfuls. Sudden changes of pasture, from pure to rich, or from rich to poor; dry, indigestible food; scanty or impure water; severely hot and damp weather, such as produces rust in grain, and neglected diarrhœa, are the

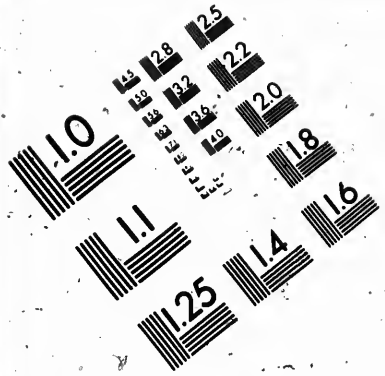
chief causes. Where large flocks are kept on extensive ranges, the best course is to remove to some other pasture where the water is good, the ground high and dry, and other favourable conditions abound. The treatment proper for this disease is to give a laxative in the first instance, as follows:

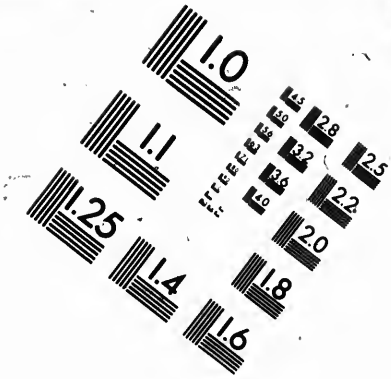
Linseed Oil ..... 2 ounces
Powdered Opium ..... 2 grains

to be given in linseed tea or oatmeal gruel. The linseed or oatmeal should be continued several times during the next twenty-four hours, both as nutriment and for its soothing qualities. The next day, and for several days, the opium should be repeated with one dram of ginger. An occasional dose of linseed oil may be given if thought necessary. It can do no harm, in any event, if given every other day. The effect of a hot sun, in an unshaded pasture, is very aggravating to this disease. Sheep suffering from it should be kept, if possible, in a cool shed, and separated from the rest of the flock. A pasture that has been occupied by such sheep will certainly infect others that may feed upon it during warm weather, the dung conveying the poison to the herbage.

Red-Water.—When sheep are suffered to pasture upon succulent green crops, such as rape, mustard, or turnips, late in the fall or in the early winter, and the fodder is covered with hoar frost or sleet, or when they are forced to scrape their food from beneath the snow, swallowing a large portion of snow with their food, or when the stock water is drawn from filthy ponds or sloughs, they are subject to a peculiar disorder which often affects the majority of the flock quite suddenly, and is known as red-water. In this country this disease is rare, being known chiefly in the Western States, along with the last mentioned disease and some other disorders originating from exposure and unwholesome food or water, under the general name of murrain. The symptoms of this disease agree with those of a so-called "unknown and new disease" affecting sheep in the west, which has been described recently by correspondents of the American Agricultural Department. The sheep affected appear dull and stupid, and stagger, carrying the head upon one side, the eyes are staring and sometimes blind, and the bowels are obstinately costive. They die in a few hours. When opened the belly of the sheep is found filled with a red fluid wrongly supposed to be blood. There is also general congestion of the principal organs.

As a preventive the use of salt is recommended, and a tablespoonful of pine tar given to each sheep every ten days has been found useful. A pound of Epsom salts dissolved in water with two ounces of ground ginger may be given to every ten sheep. The simple removal of the causes and a brisk purgative or diuretic would doubtless lead to a recovery if given in time. When inflammation occurs from neglect the bowels become affected, and death is rapid. The peculiar nature of the sheep makes treatment at this stage almost





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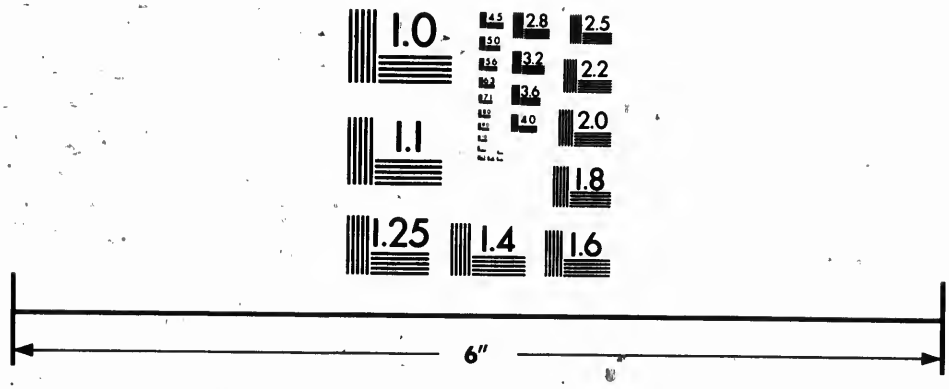

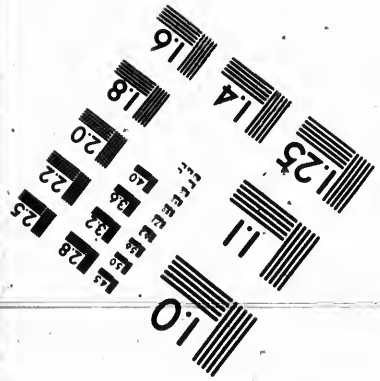

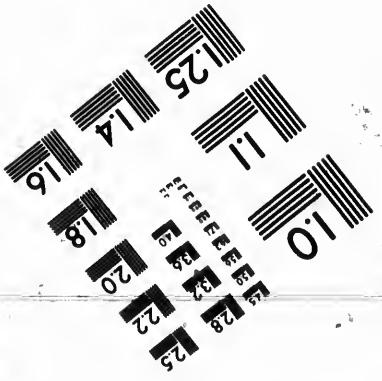

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hopeless, but, if it is attempted, that prescribed for inflammation of the bowels would be proper.

After-Pains in Ewes, or parturient apoplexy, arises in consequence of a feverish condition at the time of lambing. It occurs about the second or third day, and its presence is shown by panting, straining, heaving of the flanks, a staring look, scanty and high-coloured and strong-smelling urine, costiveness, and swelling and redness of the external hinder parts, which finally become purple and black. After death the whole system is congested, and the veins filled with black blood; the uterus, or womb, is charged with pus, the absorption of which, poisoning the blood, is the cause of death. This disease is easily prevented by reducing the condition of the ewes when it can safely be done. The safe time is some weeks before lambing, when a gentle purgative should be given and the food gradually reduced. A bran mash with fifteen grains of saltpetre may be given daily for a few days. A very gradual course of depletion only should be adopted. If, after lambing, trouble is anticipated, the appearance of the ewe should be closely watched. If the pains occur, the following sedative should be given at once:

Camphor	½ dram
Laudanum	60 drops.

These are mixed with molasses and placed on the tongue; the dose may be increased one-fourth for large ewes when the pains are excessive. One ounce of solution of acetate of ammonia may be given four hours afterwards, and repeated twice at equal intervals. If a fetid discharge takes place from the vagina, a solution of one dram of chloride of lime to a pint of warm water may be injected. The food of the ewe should consist principally of infusions of linseed or oatmeal gruel. Bleeding is injurious, as are also violent purgatives.

Black-Leg, Quarter-Ill, or Anthrax Fever, is known as the "*black spauld*" of the English shepherds, the *charbon* of the French, and as one of the "murrains" of the western states, where it is most frequent on this continent. It affects young and thrifty sheep, and is rarely found amongst old or poor stock. It appears in the spring or early summer, and also in the fall months; and mostly in wet seasons, when the pasture, under the fervid heat of the sun and unusual moisture, grows luxuriantly. Then the sheep, with vigorous appetite, gorge themselves to repletion, the digestive organs are overtaxed, the blood is disorganized, and before any trouble is suspected, the sheep drop and suddenly die. When the carcasses are examined, and the wool, which leaves the skin at the least touch, is removed, the body is found to be swollen and blackened in large patches, chiefly on the forequarter, the flank, or the hindquarter. Air is gathered beneath the skin, and on opening the body, it is found decomposed and filled with black blood. If the

flock is then observed, some will be found lame and limping, and on examination the sides or quarters will be found swollen, and when the hand is passed over these spots, the wool readily comes off, and a crackling sound is heard from the motion of the air or gas collected beneath the skin. The mouth and tongue are found to be inflamed and blistered, and the eyes red. The urine is dark, the bowels constipated, and the dung when discharged is bloody. By and by the animals are unable to stand, and fall upon the side, stretch out the limbs, and protrude the tongue; the belly is swollen, and in a few hours the sheep is dead. The disease is much worse in rich bottom lands, or moist, black soils, and rarely appears on hilly ground, or gravelly, dry soils. To prevent this disorder, it is only necessary to prevent the causes, to ensure regular feeding, and avoid sudden changes from poor to rich food or the reverse. The treatment should be an immediate purgative. The following may be given in oatmeal gruel or any other thick mucilaginous liquid:

Sulphate of Soda	3 ounces
Flowers of Sulphur	1 ounce
Powdered Myrrh	1 scruple.

A teaspoonful of spirits of nitrous ether in a pint of water may be given in six hours afterwards. If taken at the commencement of the symptoms, this treatment will probably be effective, but if later, the uncertain remedial action of nature alone can be depended on.

Aphtha, or "foot and mouth disease," which has grievously affected the herds and flocks of Europe, is not altogether unknown in America. Fortunately our drier climate, or some other preservative influence, has very greatly circumscribed the course of this disease. It has appeared in various parts of the country, but only sporadically, or in scattered cases, and never yet has it swept over an entire district. Nevertheless, no one can be sure that it never will so appear, and as an isolated case requires the same treatment as any other, it is well that the disease should be described here. It is a true blood disease, belonging to a class of eruptive fevers arising from a poisoning of the blood, and is highly contagious under favouring circumstances. It affects alike cattle, sheep, pigs, hares, and rabbits. It appears as an eruption of watery blisters upon the lips and tongue, and between and around the hoofs. The first symptoms are a fit of shivering, succeeded by fever, cough, and an increased pulse. This is succeeded by a failing of the appetite, tenderness over the loins, flow of saliva from the mouth, and grinding of the jaws. Blisters, small and large, appear on the mouth and tongue, which break and become raw, causing great pain. The feet are swollen and also covered with blisters, which break and become sore, causing the animal to walk with difficulty and shake its feet or kick or lie down persistently. In from ten to fifteen days the disease runs its course, in favourable circumstances, and the animal recovers gradually, and is never affected afterwards. Other-

wise the symptoms increase in severity, the sheep lose condition rapidly, from inability to eat or move about; the hoofs are sloughed off, and sometimes even the bones of the feet are cast off, leaving only a stump. In-lamb ewes, when affected, abort. It is considered, where this disease is virulent, that the cheapest and most effective plan is to stamp it out by the slaughter and burial of every infected animal, and the removal of those that are well. In the simple form, a single brisk purgative, such as two ounces of Epsom salts, with a small quantity of ginger, generally results in a cure; to repeat the dose is dangerous. The mouth should be washed in the following solution twice a day:

Alum in powder	1 ounce
Tincture of Myrrh	1 fluid ounce
Water	1 quart.

The feet, if affected, should be washed with soap and water, or with a weak solution of sulphate of copper, then dressed with carbolic ointment, and afterwards bound up in a cloth so as to keep sand or dirt from irritating the sensitive surfaces. Sulphur should be burned in the sheds as a disinfectant and purifier, and the drinking water should be acidulated with one dram of aromatic sulphuric acid to a gallon of water. All sick animals should be isolated.

Sheep-Pox, or variola, is a formidable and fatal disease, which is very frequent in the central and eastern parts of Europe, and has recently been introduced into England by means of importation of infected sheep. Although unknown in its severe type in this country, yet we have no security against its introduction at any day. It is recorded in a German publication that on one occasion every sheep in a whole district was swept off by this disorder, the sheep dying without any apparent reason, as though they had been poisoned. The only known preventive is artificial inoculation by means of lymph taken from one of the mildest cases. These communicated cases are exceedingly mild. The practice of housing sheep is very productive of this disease, and it is when sheep are kept in small flocks and well supplied with fresh air and general good care that the disease makes no headway. Whenever our flocks shall be overcrowded, and poorly cared for, this disease may be apprehended. Sheep-pox is not identical with the human small-pox, but is yet of the same type, produced by the same causes, has very similar characteristics, and is equally contagious. It cannot, like that of the cow, be communicated to mankind, nor to other animals than sheep, even by inoculation, and belongs exclusively to them. It is a true blood poison, caused originally by the absorption of impure matter into the blood, probably through the lungs, and the course of the disease is an effort of nature to throw off the poison by the eruptions which appear on the skin. There is a period of incubation of the disease, which lasts nine to eleven days after infection, and during which no

symptoms whatever appear. After this the sheep sicken, refuse food, and suffer from quickened breathing, a hot, dry skin, an unquenchable thirst, redness of the eyes, and a discharge from the nostrils. At this period the eruption occurs on the body just as in the human small-pox. The bare skin under the arm-pits shows the first indications of the eruption. Pustules or pimples surrounded with a red ring (the areola) appear, and gradually after three days come to a head and take on a white appearance. It is at this stage of the disease that the matter is collected and preserved for the purposes of inoculation. The symptoms decrease at this stage and the sheep improve. The pustules dry up and form scales or scabs, which fall off and leave in their places "pits" or marks. But it may be that these pimples run together or become "confluent" and ulcerate. If this happen the sheep almost invariably die. Otherwise the recovery is rapid.

Treatment by medicine is entirely unavailing. Good nursing of the patients, and the use of sustaining stimulants with laxative and demulcent food includes all that can be done. Linseedmeal, ricemeal and oatmeal, made into drinks and given warm, with a small quantity of sugar or molasses and ginger will be sufficient in the shape of food. Pure soft water made slightly warm, and acidulated with a few drops of aromatic sulphuric acid, should be given for drink.

Hopeless cases should be ended at once. If at the last stage the symptoms become worse, and the pimples, instead of becoming brown and drying up, ulcerate and run together in chains, the animal should be killed and buried in a deep pit with plenty of lime thrown on the carcass. Every portion of the dead animal will convey infection, and in no case should the wool be taken from it, unless it be at once tubwashed in boiling hot soapsuds.

On the appearance of the disease in a neighbourhood, the unaffected sheep should be inoculated. A quantity of the matter from the white pimples is kept in bottles and diluted with water to the consistency of cream. A needle mounted in a wooden handle—a shoemaker's curved awl will answer the purpose excellently—is dipped into the fluid and is thrust beneath the skin of the fleshy part of the tail. This rarely fails to communicate the disease, which is so slight as seldom to interfere with the feeding of the flock. In a paper published in the Journal of the Royal Agricultural Society of England, Vol. XXV., Part 2, 1864, written by a gentleman who had had charge of flocks of Merinoes varying from a few thousand up to twenty-five thousand, in Russia, and who always practised inoculation, the author states that although the sheep under his charge were constantly exposed to contagion from neighbouring flocks, in which thousands died from neglect of this precaution, yet *he never lost a single adult animal from the disease.* In those countries where the disease prevails, every shepherd has an inoculating needle amongst the implements of his profession.

Diseases of the Urinary Organs.—The urine of a healthy sheep is alkaline. Under some circumstances the urine becomes acid. This abnormal condition produces a disordered condition of the highly sensitive urinary organs. If the flow of the urine is obstructed, it is absorbed into the circulation, and a variety of diseases are produced, all of which have one constant distinguishing symptom, viz, the strong smell of urine given out by the other secretions of the system, but especially by the secretions of the skin. The blood is poisoned by the absorption of the matters which the urine should have carried off, and a high condition of fever is consequently produced. Male animals are more frequently affected than females, by reason of the peculiar structure and length of the urinary canal, already described. Fattening animals are especially subject to urinary disorders, and such need close inspection and great care.

Inflammation of the Bladder is the most frequent of the urinary diseases. Feeding upon second growth clover, which often contains lobelia, St. John's wort, rag weed, and other irritating plants, or upon excessive quantities of cornmeal, or drinking hard water, are the chief causes. The acid and consequently irritating character of the urine inflames the inner coats of the bladder. The inflammation spreads to the muscular substance round the neck of the bladder, and this is contracted, closing the opening.

Retention of Urine is, therefore, the direct consequence, and this involves the serious complications already mentioned. The symptoms are uneasiness, constant lifting the hind feet and stamping with them, spreading them out and straining in the endeavour to void urine. As the attempt is abandoned the animal moans in pain. There is general disturbance of the system, fever, and costiveness. The remedy is to bleed copiously from the neck, and to give the following to a large animal:

Linseed Oil	2 ounces
Laudanum	2 drams.

For smaller animals the dose should be reduced proportionately. If there is no improvement the second day, the bleeding should be repeated from the other side of the neck, and one ounce of linseed oil be given daily until relief is procured. Diuretics and saline purgatives should be avoided. After improvement the food should be light, and infusions of linseed meal or of gum arabic would be useful.

Sediment in the Urinary Canal.—Highly-fed sheep, or those fed on dry pastures, which are deficient in water, or those carelessly denied a full supply of water in winter, when they are fed grain in less or greater quantities—rams and wethers especially—are those which are subject to this disorder. Females, from the large capacity of the canal, are never, or very rarely, affected. But in male animals the peculiar appendage, called the

vermiform, or worm-like appendage, through which the canal finds its exit, being very small, an easy obstruction is offered to the passage and discharge of any sandy or muddy deposit of the urine. Small stony concretions are often discovered attached to the wool or hairs around the vent on the belly of the sheep. When these are noticed, extra care should be exercised to give abundant water by which the deposit may be dissolved and carried away. When the deposits have been arrested in this narrow passage, the urine is seen to pass drop by drop, and the animal exhibits great pain and uneasiness. All the symptoms of *retention of urine* then appear. The treatment is to place the animal on his rump, and draw the penis out of the sheath. It will be found inflamed and tender. It should be fomented with warm water, and the urethra or canal below it gently pressed with the fingers to force out the urine and with it the sediment. If this is successful even in part, some sweet oil should be applied to the parts, and a rather large dose of linseed oil be administered along with an antispasmodic to act on the neck of the bladder, viz.:

Linseed Oil	3 ounces
Extract of Belladonna	10 grains.

On the following day the urethra should be again examined, and the manipulation be again repeated. One dram of carbonate of potash should then be given, dissolved in water, three times a day. If fever is present the belladonna may be repeated, but only in case of urgency. No saline purgatives are to be given in affections of the bladder. If the sediment cannot be passed, it will be necessary to remove it by an operation. A lengthwise incision is made with a small, sharp knife blade at the junction of the vermiform appendage with the urethra, on the lower surface, and the stones or gravel are removed by pressure. It may be discovered in this manner that the obstructions exist all along the urethra, in which case there is no hope of recovery, and the animal may be slaughtered. In case of wethers, the vermiform appendage of the penis may be cut off at once. In rams it may be saved if possible, although it is not absolutely necessary for successful stock-getting. It may be well, however, to be on the safe side, and save the part out of respect to the generally accepted belief that it is needful. It is known, however, that many rams which had lost the part by this operation did not lose their usefulness in consequence.

Calculi, or stone in the bladder. For this disease there is no remedy, and if after the fact has been ascertained by the previously described operation, or in any other way, the animal may be killed.

Clap or Gonorrhœa.—This disease affects the sheath and penis of the ram. The first symptoms are very similar to those of sediment in the urethra. There is great pain in urinating, and the urine comes by a few

drops at a time. In course of time a white acrid discharge escapes, and this, in case of neglect, causes ulceration, which may destroy the organ. Rams thus affected should not be used, as the disease is contagious, and the symptoms are aggravated. The causes are excessive work and want of cleanliness. The treatment consists of turning the animal on its back, withdrawing the penis gently, holding it with a soft linen cloth wetted with the lotion mentioned below, until all the diseased parts are seen. The organ is then bathed and washed thoroughly with the following lotion, viz.:

Spirits of Camphor	4 ounces.
Sugar of Lead	1 ounce.
Sulphate of Zinc	2 onnces.
Water	1 quart.

Mix and bottle for use. If any of the ewes have become diseased by contact with a diseased ram, a soft linen cloth may be wrapped around the finger, dipped in the solution, and inserted in the parts until they are thoroughly washed. Or a portion may be injected with a syringe. A daily dressing should be given until a cure commences, afterwards twice a week will be sufficient. One ounce of linseed oil should be given every other day until the urine passes freely. The food should be laxative, and nothing stimulating should be given until a cure is effected. Copious demulcent drinks should be given, such as infusions of linseed, oatmeal, or gum arabic.

Diseases of the Brain—Apoplexy—Staggers.—Some of the high-bred sheep, the Leicesters more especially, as well as some native sheep that have been poorly kept and fed, are subject to occasional attacks of giddiness and blindness, in which they stagger about and run against walls, fences, or other obstructions, evidently unable to see. The attack comes on suddenly, the sheep stops and stands staggering, or still moves on its former course with eyes dilated and prominent, but unconscious of impediments. The appearance of the eyes and membranes shows that the vessels of the head are full of blood, and post-mortem examinations have shown the brain to be highly congested, and sometimes the vessels ruptured. Pressure of blood on the brain is the cause of these symptoms. Plethora, from continued high feeding, or from indigestion or other disturbance of the condition of the digestive organs, produces this determination of blood to the head. Removal of the causes, depletion of high conditioned animals, by saline purgatives, or the restoration of the tone of poor conditioned ones by good food and tonics, tends to a cure. Bleeding from the facial vein is often useful in extreme cases.

Inflammation of the Brain (Phrenitis).—The causes which produce apoplexy, if long continued, result in inflammation of the brain, and this produces frenzy. The affected animals are very violent, dashing hither and thither, regardless of danger or damage to themselves. Lambs thus affected leap and throw themselves about as if in violent play, until they fall

and die in convulsions. The only remedy is copious bleeding from the neck, and active purging with salts. In this case no accompanying stimulant is needed, and for a full-grown animal, the dose may be increased one-half above the usual quantity. There is always congestion of the brain accompanying this disease, and treatment must be instant, lest in the muscular excitement the vessels of the brain be ruptured and sudden death ensue.

Paralysis—Trembles.—This disease is a different manifestation of the effects of pressure of blood upon the brain from the two diseases previously described. In this disease, in addition to the base of the brain, the spinal marrow and the nervous system connected therewith are affected, the congestion occupying a considerable portion of the vertebral canal. Its effects are varied. In some cases the animal loses the power over some of its limbs; the hinder half of the bodies of some are rendered incapable of motion; in others, the sheep stands, trembles violently, with the head drawn back or to one side, the jaws are tightly closed, and froth is forced through the teeth and lips; the breathing is hurried, and the fit, which lasts for a short time, recurs at short intervals. At other times the animal, which may appear perfectly well, will suddenly spring from the ground, scream and fall dead. Others will fall deprived of motion, and remain sprawling, with limbs stretched out, until they die of starvation. The power of swallowing is gone, and there is generally very great difficulty of breathing in consequence of the affection of the pneumogastric nerve and the resulting paralysis or spasmodic condition of the muscles of the throat and chest. Animals in poor condition, subjected to cold and exposure, suffer mostly from this peculiar form of disease.

The treatment proper to these varied cases depends upon whether the patient is in the active or collapsed condition. On the first attack, bleeding from the facial vein is the proper remedy, and generally gives immediate relief. But, after the animal has passed through this stage, a condition of collapse follows, and instead of depletion, the opposite course is necessary to be taken. Tonics and stimulants are then needed. Warm milk or gruel, sweetened and mixed with ginger, followed by a teaspoonful of aromatic spirits of ammonia, or one scruple of carbonate of ammonia, mixed with gum water or cold linseed tea, should be given. If the bowels are constipated, a dose of linseed oil (but no salts) should be given. The body may be swathed in a rag dipped in hot water, to which an ounce of ammonia water has been added. On recovery, the food should be generally improved in character, and a daily dose of one scruple of sulphate of copper may be given with some meal, or mixed with molasses and placed on the tongue. This disease is the most frequent one of the kind from which our flocks suffer.

Epilepsy is a very similar disease to the preceding. It occurs chiefly in young or poor sheep which are turned out to feed early in the morning

when the herbage is covered with hoar-frost or snow. The rumen being chilled causes the blood to determine to the brain, and the animal becomes convulsed. No treatment can avail anything, but prevention is everything.

Lockjaw, which is a violent excitement of the nervous system, sometimes occurs in consequence of exposure to wet and cold, and sometimes in consequence of injury to the nerves through the violent twisting of the spermatic cord and vessels in the operation of castration. The jaws are closed, but can be moved laterally, and there is grinding of the teeth; the head is bent round, the neck twisted, and one or more of the limbs are rigid. In this condition the sheep may remain a day and then die, or, if it remain longer, it may recover. A warm bath, if the sheep is not too large, is useful; and the animal should be kept warm and in a quiet place. A dose of two ounces of Epsom salts should be given, followed by two drams of laudanum after two hours. Warm gruel, with a quarter of an ounce of ginger, should be given two or three times a day. Quiet and warmth are indispensable to a cure.

Palsy.—This disease consists in a total suspension of action in the nervous system, generally in consequence of exposure to severe cold and wet. Lambs that are thoroughly chilled by cold rain and winds, or newly shorn sheep similarly exposed, are the most frequent subjects. Ewes having been exhausted by protracted labour, or by abortion, or newly dropped winter lambs that have been neglected, also suffer from it. Heavy feeding on mangels or watery roots has been known to produce it, and it has been stated recently that roots grown upon land that has been heavily dressed with superphosphate of lime have produced this complaint in several English flocks. It is very questionable if the phosphate has any direct agency in producing it. The sheep suffering from it lie totally helpless, the whole body being incapable of movement, the respiration is almost stopped, and the eye is dead looking and lifeless, the eyelids quivering occasionally.

The treatment consists in the application of warmth, and a stimulant such as mustard or ammonia and sweet oil rubbed on the brisket and the spine. The following dose may be given twice a day, viz.:

Spirits of Nitrous Ether	2 drams
Powdered Ginger	1 dram
Powdered Gentian	1 dram.

Warm drinks should be given at short intervals. If the animal is purged, the chalk mixture prescribed for diarrhœa should be given. If the palsy is not relieved by this treatment, the following may be given:

Tincture of Nux Vomica	4 drops

Parasitical Diseases of the Intestines.—Parasites which infest animals are divided into two classes, internal parasites called *entozoa*, and

external ones which are called *epizoa*. Since the natural history of microscopic animals, and those which undergo changes only to be discovered by the use of the microscope, has become better known, much in regard to some peculiar diseases of animals is now understood. Formerly it was believed that spontaneous generation of minute animalculæ could occur, and that parasites were "bred" by diseased matter. What was then supposed to be the consequence of certain diseased conditions is now known to be the cause of them, and the whole subject of parasitical disease is in course of satisfactory explanation. But as yet there is much to learn, and the investigation of the subject is surrounded with difficulties. The most important of all the internal parasites which injuriously affect the sheep is undoubtedly that known as

The Liver Fluke, the *Distoma hepaticum* of Rudolphi, or the *Fasciola hepatica* of Linnæus, which inhabits the gall bladder and ducts, and penetrates the substance of the liver. Its presence in this organ produces disorder of its functions and a diseased condition of the animal known as

The Rot, or the Liver Rot.—This disease has been the most dreaded by the shepherd for centuries past. It has carried off millions of sheep in a single year, in Australia and South America, and is very prevalent in Europe. In 1830 two million sheep died in England of this disease. It exists in America, both in imported sheep and the native flocks, and thousands die every year of it without their owners having knowledge of the cause. The symptoms of the disease are, however, very marked and significant. In the healthy sheep the conjunctiva, or the membrane which covers the eyeball in front, and lines the eyelid, is brilliantly red; so much so, that those unused to observe these things closely, would suppose the eye to be highly inflamed. When affected with the rot, the conjunctiva is pale and eyeball yellowish. When this sign appears, and the sheep is found to be ailing, it is certainly infested with flukes. There are other symptoms which indicate less certainly this disease, because they are found present in other ailments also, but this symptom is peculiar to this parasite. As the disease progresses, dropsy is always present, and a watery tumour or bag appears beneath the lower jaw. The skin is pale and bloodless, and the wool is dry, harsh, ragged, and readily parts from the skin. The skin is drawn tightly, and the spine is arched and prominent. The appetite is irregular and depraved, and the thirst excessive. These symptoms increase until the sheep dies completely emaciated.

The treatment consists wholly in prevention or in attention at the first stages. When the rot has become developed no medicine avails anything. It is wholly and surely prevented by keeping the sheep on dry pastures and away from stagnant water. The fluke there can find no development. Low pastures should be drained, ponds fenced off, and well-water used for drinking

purposes. Hay from low grounds may even communicate this disease. When these preventive measures cannot be wholly carried out, the sheep should be abundantly supplied with salt, and on the first appearance of suspicious symptoms the following mixture should be administered, viz.:

Saltpetre	1½ ounce
Powdered Ginger	1 ounce
Carbonate of Iron (Colcothar of Vitriol)	½ ounce
Salt	1 pound
Boiling Water	3 quarts.

The above to be mixed, and, when nearly cool, nine ounces of spirits of turpentine are to be added. The whole is bottled in quart bottles for use, and when administered should be well shaken to mix the ingredients thoroughly.

Infected sheep should be kept from food all night, and on the following morning, before feeding, each should receive two ounces (a wineglassful) of the mixture by means of a horn. No food should be given for three hours. The medicine is repeated every fourth day for two weeks.

Sheep may live and thrive, and yet carry flukes. How many they can tolerate without serious injury is a question that will probably never be satisfactorily answered. It is proper that the shepherd should be always on his guard against them, for the reason that this animal is now known to be native in this country as well as in almost the whole world.

The Lung Strongle.—The "lung thread-worm" (*Strongylus filaria*) lives in the windpipe, the bronchial tubes, and the tissues of the sheep's lungs. It is a white, thread-like worm, from one inch to three inches in length. Its natural history is supposed to be as follows. The worms present in the lungs breed and produce eggs, which contain fully developed young, wound up in a spiral form in a thin shell. These embryos soon leave the shell and move about in the tubes, causing great irritation and a secretion of mucus, upon which they feed and grow. It is not certainly known as yet if the sheep in the violent coughing caused by the irritation expels any of the eggs or young worms, and that they then pass a portion of their existence in the open air, finding their way into the lungs of fresh bearers by the trachea in the passage of the food through the mouth or gullet, or from the stomach in the act of rumination; or if the worm completes its whole existence in the lungs of its bearer. It is most probable that the former supposition is the true one, as it explains the fact that the worms are often found in young lambs in such quantities as to cause suffocation. Besides, it is known that flocks which follow other sheep upon pastures, or which feed upon fields that have been manured with sheep's dung, have been attacked with this disease. An interesting case in point is stated by a Pennsylvania correspondent of the *Country Gentleman* of March 25th, 1875. Some ram lambs were pastured in a field upon which their dams had been kept the previous year, and which had been topdressed with manure from the sheep sheds. Nineteen out of forty of the

lambs died. The following year twenty-three lambs died, and the *post mortem* of the physician showed the fact, that the larynx and trachea were covered on their inner surface "with a frothy mucus, generally white, but here and there of a yellowish hue," also in this mucus were "several worm-like bodies about one half a line in diameter, and from one to two inches in length." Under the microscope these proved to be articulates, some of which contained what seemed to be ova. A microscopic examination of the mucus showed these ova in various stages of development. The worm-like bodies were undoubtedly the lung thread-worms under consideration. For several years afterwards the lambs which pastured on the topdressed meadows took the disease and died. The symptoms which indicate the presence of this worm are a loss of condition, a constant and severe cough, a dropsical condition, as shown by the watery tumor beneath the throat, and a pining and wasting away. The skin is pale, and the eyes pearly and bloodless. After death there is no sign of disease, except the presence of the worms in the lungs and windpipe, and complete emaciation. The means of prevention are obvious. Pastures or meadows should not be topdressed with sheep's manure, unless they are to be ploughed and sown to grain crops, and if a pasture is found to be infected, it should be ploughed up and re-sown. All sheep having the characteristic cough should be fattened and killed.

The treatment proper in this case is the same as that recommended for the liver fluke, and the mixture should be administered as there stated. Turpentine and salt are found to be almost sure remedies for internal parasites of all kinds, and extra feeding to resist the draft upon the system will be useful.

Hydatids or Bladder-Worms.—The association of the dog with the sheep upon farms is productive of much mischief, in addition to the vast annual slaughter of the latter occasioned thereby. The great majority of dogs are infested with tape-worms. The eggs of the tape-worms discharged in the dung of the dog upon fields and pastures are swallowed by the sheep with the herbage, and the larval state of the worms is developed within their bodies, either in the lungs, the abdomen, or the brain, causing disease which is often fatal. The larvæ of the tape-worm exist in the shape of watery bladders, or sacs, which contain the undeveloped worms. These peculiar creatures are known as bladder-worms or hydatids. One of these occupies the abdominal cavity of the sheep, and is called the

Diving Bladder-worm, *Cysticercus tenuicollis* or *C. tænia marginata.*—These bladders are often free in the abdomen, are sometimes enclosed in the fat, and sometimes are attached to the liver and intestines. They are pear-shaped, and in size from that of a walnut to that of a hen's or even a goose's egg. These bladders, or cysts, when fed to a dog, have produced the mature *Tænia marginata* upwards of three feet in length in the course of three

months. The eggs of this tape-worm have been fed to lambs, and have produced the hydatid, or bladder-worm, of which hundreds were found in the abdomen of some of the lambs, which died soon after receiving the eggs. Another of these hydatids is the

Many-headed Bladder-worm, or *Cysticercus tænia echinococcus.*—This finds a home in the lungs and liver of the sheep and other ruminants, and also infests mankind. As many as several hundred cysts have been taken from one sheep. This is a most dangerous parasite, for if taken into the human stomach, it may produce "bladders" in the brain, as it actually has done in well authenticated cases, which are certainly fatal. The cysts reproduce themselves by a species of budding, and thus rapidly increase and spread through the bodies of their bearers. The most common of these hydatids is

The Brain Bladder-worm, or *Cœnurus cerebralis.*—This produces the common disease known as turnside, or giddiness, in which the sheep turns its head to the left or right, and walks round and round in a circle in the direction in which the head is turned, until it falls giddy and exhausted. The presence of this parasite has been discovered in the liver of our gray squirrel, and in rabbits, as well as in numerous sheep in this country. In the sheep it is generally found in the brain, although it is not peculiar to that organ. It is only there, however, that it produces the usual disastrous effects upon the sheep. The hydatid is a bladder filled with a viscid fluid, and covered on its outside surface with marks or oval slits. These slits are the spots to which flask-shaped appendages are affixed within, and are the openings which lead to the interior of these appendages. The pressure exerted by these bladders upon the brain produces the peculiar symptoms exhibited, and the act of turning to one side or the other helps to determine the seat of the hydatid in the body of the brain, which is found to be on that side to which the sheep turns. The natural history of this parasite is as follows: When the head of a sheep, containing the bladder-worms of this species, is devoured by a dog, the larvæ are transformed within him into tape-worms. This worm (*Tænia cœnurus*) at maturity, or its eggs, being voided by the dog upon the grass of a pasture, are swallowed by the sheep, are hatched in its stomach, and penetrate all parts of the body, perishing everywhere except in the brain, which is its usual habitation. There they develop, remaining dormant, until chance favours their round again. Old sheep are rarely affected by this parasite, the lambs suffer chiefly from them. One infested dog will void thousands of eggs, which not only escape with the dung, but being attached to the anus, are carried about and dropped in a multitude of places.

To prevent the spread of this parasite, it is necessary only to prevent the heads of affected sheep from being devoured by dogs or hogs, or to keep dogs from the pastures. The heads of sheep dying from the disease should there-

fore be burned, and not thrown out. The treatment of sheep subject to the parasite consists in an operation by which the skull is pierced and the bladder punctured, when the water in it escapes and is absorbed, leaving the worm to perish. The pressure and irritation upon the skull causes some absorption of its substance, and a soft spot is caused over the bladder. This may be easily felt by pressure of the finger. A curved awl may then be inserted through the skull and the bladder pierced; or by means of a tubular saw (or trephine) a round piece of bone is cut out of the skull, a flap of the skin first being laid back, and the bone being lifted, the bladder is laid bare and removed. The skin is relaid and held in place by a stitch or plaster, and the wound heals. No other remedy than these is safe or certain, and these frequently fail. This class of parasites possesses some importance to the shepherd, not only from the loss occasioned amongst his flock, but from the danger of the results to the consumers of mutton. The farmer's or shepherd's own dog may be the means of injury to his flock, and he should take means to free the dog from the tape-worms by means of proper medicines, of which the powdered areca nut is the most effective, as well as to prevent vagrant dogs from stocking his pastures.

The areca nut is administered as follows: previously, one scruple of jalap, for a dog of twenty to thirty pounds in weight, should be administered, and a brisk action of the bowels set up. This may also be procured by giving the dog a quantity of butter, or any of the common purgatives. Immediately afterwards half an ounce of the powder of areca nut is to be given in pills or in some acceptable food. Some locks of tangled wool dipped in grease or melted fat are given at the same time to be swallowed. The worm is killed or paralyzed by the areca nut, is entangled in the wool, and all together are expelled by the purge. The mass should be immediately burned, or buried at a perfectly safe depth in the ground. Applied to every dog at intervals of three months this treatment will free them from tape-worms, and prevent danger of the sheep becoming infested with them.

Tape-Worms *(Tænia plicata)* in the intestines. The sheep themselves are sometimes infested with mature tape-worms. This is easily explained by the possibility of the sheep swallowing along with their pasture some of the eggs which may have been voided by any of the numerous bearers of these worms, both domesticated and wild. It has been stated that the intestinal tape-worm is very rare, if not unknown, in sheep in this country. This would seem to be erroneous. A correspondent of the *National Live Stock Journal* of September, 1875, from Missouri, reported his lambs all dying of a strange disease, n which the first symptom was a falling off in condition, followed by a mild diarrhœa. This occured in June, and continued up to August, when thirty out of sixty were dead, and nearly all of the

remainder were ailing. On examination after death the small intestines were found "packed full of tape-worms." This can hardly be an unique case, and we may very well conclude that tape-worm in the intestines is one of the parasitical diseases that we have to combat.

Generally the symptoms developed by the presence of tape-worms are voracity of appetite, alternating with a refusal of food; loss of condition, desire to swallow earth, stones, sand, or ashes; the passage of soft dung, mixed with mucus, which becomes attached to the vent and tail, causing a very filthy condition; and the evidence of internal pain. The sheep finally dies greatly emaciated. There is no means of prevention, as the eggs may be dropped by rabbits, squirrels, skunks, and other wild animals which frequent the fields. The treatment most effective is to administer turpentine as follows:

Linseed Oil	2 ounces
Spirits of Turpentine	½ to 1 ounce

This should be repeated twice a week for two weeks. If this is not effective, three ounces of the powdered root of male fern may be given. The dose to be repeated in one week. In six hours after this is administered, a purgative of linseed oil should be given. The food should be of the best kind until the lost condition is restored.

Tape-worms, in any of their forms of life, affect only young sheep and lambs. When sheep attain the age of two years they are safe from them, and it is very rare indeed that one older than this becomes infested with them.

Hair-worms in the Intestines.—A species of "hair-worm," called from its peculiar formation *Tricocephalus*, is not uncommon in sheep. It infests the stomach and intestines, causing obstinate diarrhœa, and rapid wasting of flesh. These worms burrow their heads into the membrane lining the organs, and suck out the juices. The irritation produces diarrhœa, which submits to no treatment while they remain. A cough is often present along with the diarrhœa. Other species of worms, of habits identical with these, and producing the same injurious effects, also infest the sheep, but more particularly lambs and yearlings. Salt in doses of half an ounce, given on alternate days with one dram doses of sulphate of iron, the salt being given on one day and the iron the next, is a very sure remedy for this class of parasites, and the diseases which result from their presence. To counteract the debilitating effect of these parasites, the food should be of the most nutritive and digestible character, and linseed in some shape should not be omitted.

Parasites and Parasitic Diseases of the Skin.—Of the *epizoa* or external parasites of the sheep, the most formidable is the *Scab insect*, or *Acarus scabiei*. This is a minute mite which attaches

itself to the skin and penetrates the surface, lodging itself in the tissues and causing intense irritation or itching, and the secretion of a serous exudation which dries upon the surface and forms a scab. This disease was well known to ancient shepherds, and an exact description was given by the poet Virgil in his *Georgics*. It is mentioned by the historian Livy as being very virulent in his time. But up to a very recent date the cause of the disease was not correctly known. Youatt's work on the sheep, published in 1840, by the English "Society for the Diffusion of Useful Knowledge," states it to be caused by bad keep, starvation, over-driving, dogging, exposure to cold and wet, and other causes of a *suppression of the perspiration*.

The symptoms first observed are restlessness and uneasiness, and the observant shepherd will have his suspicions aroused and search for the cause on the first appearance of these symptoms amongst his flock. As the disease progresses, the sheep are found rubbing or scratching themselves, or biting or nibbling amongst their wool. The attention should then be directed to the parts rubbed or bitten. If scab is present, the skin will be at first white in colour and of a thicker texture than the rest, and moist or covered with a yellow exudation. Later these parts are covered with scab, and the wool falls off or becomes loose. If a lock of this wool be laid upon a sheet of white paper, the mites will be seen, with the unaided eye, as they crawl from it. If the disease is neglected, the scabby spots enlarge and increase in number, the wool appears ragged all over, and falls off in patches. Upon these bare spots dense brown or yellow scales are seen, and if the sheep can reach a fence or a post the scabs are rubbed until they bleed and become sores. The condition of the sheep falls off rapidly, and it becomes a woe-begone object.

The treatment is by dipping in a liquid which penetrates and softens the scab so that it can be removed, and which poisons the insect. There are many preparations used for this purpose, some of which are objectionable on account of their poisonous properties, such as mercurial or arsenical compounds, and which are no more effective than the following perfectly safe one. This consists of tobacco and sulphur in the proportions of four ounces of the first, and one of the second, to the gallon of water. The water is brought to a boiling heat, and the tobacco, either coarse cheap leaf or stems, which are equally good, is steeped (but not boiled) in it until the strength is exhausted. The sulphur is then stirred in the liquid. When it has become reduced in temperature to 120 degrees, it is ready for use. The sheep are entirely immersed in the liquid so that the wool is completely saturated. Hard crusts of scab are broken up and removed with care, and the raw surfaces are well washed with the decoction. The dipped animals should be kept in a yard until the wool no longer drips lest the pasture should be fouled, and the sheep sickened by the tobacco juice. After ten days the dipping is repeated to destroy any newly hatched mites. With care the most badly infected locality

may be completely freed from this pest, and it will never appear if the sheep are dipped twice each year as a preventive. The gain in the growth of wool and in it improved quality will more than repay the cost of the operation.

The Sheep Tick (*Melophagus ovinus*) has been already referred to; if the process of dipping, just described, is regularly practised this parasite will be easily vanquished, and its annoying presence prevented. This insect propagates only by single eggs, or rather the perfect pupa is expelled singly from the female, which is therefore termed *pupiparous;* it does not, therefore, increase very fast, and is easily kept under. It is too well known to need minute description, its dark red, tough, leathery-skinned body being a most conspicuous object when the wool of almost any sheep in the country is examined.

The Sheep Louse (*Trichodectes ovis*), is known as the red sheep louse. Its head is of a red colour, and the body pale yellow, marked with dark bands. It is found on the side of the neck of the sheep, and the inner parts of the thighs and arms. It causes much irritation, by which the sheep is impelled to thrust its head between the bars of gates or fences, or to kick and stamp with its legs. Occasionally sheep are found strangled by becoming fixed in their attempts to rub their necks, or with their legs broken in attempts to rub them upon rails. Lice are rarely found on the yolky woolled sheep, but on the drier fleeced breeds they often cause much unsuspected mischief. Those sheep which are regularly dipped are also free from this pest. To rub the parts mentioned with the following preparation is generally an easy remedy.

Lard	1 pound
Flowers of Sulphur	2 ounces
Creosote	20 drops.

One pint of sweet oil may be substituted for the lard.

The Sheep Gad Fly (*Œstrus ovis*).—This is a most troublesome pest, causing much discomfort to the sheep. It is a fly with two wings spreading over one inch, and a stout body over half an inch in length. In the summer months they disturb the sheep in the pastures by the efforts they make to deposit their eggs upon the animal's nostrils. When they succeed in their efforts, the sheep often becomes half frantic, and races violently over the pasture, sometimes seriously injuring itself by becoming overheated. Where the fly abounds, the sheep crowd together and stop feeding, holding their noses to the ground, and stamping with their fore feet. The grub when hatched from the egg, crawls up the nostril and lodges in the sinuses of the head, where it remains, feeding upon the mucus secreted by the membranes, until the following spring. In entering the nostrils and in leaving them they

cause much irritation to the sheep. The remedy lies in preventing the fly from laying its eggs, and this is done by smearing the nostrils of the sheep with tar, diluted with grease or butter. This is both distasteful to the fly and fatal to the egg. By preparing a pailful of the mixture, and smearing the noses of the sheep with a brush, as they pass one by one through a half-opened gate, every morning during fly time (July and August), the sheep will be spared much annoyance. When grubs are crawling down the nostrils early in spring, they may be quickly dislodged by blowing tobacco smoke into the nose through a pipe.

The Maggot, so called, is a formidable enemy of the sheep. It is the larvæ of the common flesh fly (*Sarcophaga carnaria*), the blue-bottle fly (*Musca Cæsar*), and the meat fly (*Musca vomitoria*), all of which deposit their eggs or living larvæ upon decaying animal matter. When sheep are wounded by accident, or allowed to become filthy when troubled with diarrhœa, these eggs or larvæ are deposited in vast numbers; the ovaries of a single *Sarcophagus* having been found to contain 20,000 eggs. The maggots soon become active, and spreading from their quarters, attack the skin, which they irritate and cause to secrete a serous fluid. In time the skin is pierced, and the flesh suppurates and wastes away, being devoured by the multitude of maggots which crawl upon it. In wet seasons the mischief is greatly increased. To prevent them it is necessary to carefully remove the wool from about the tail so that filth may not gather; to watch for any accidental wound; and in warm wet weather, for any dirty tags of wool upon which the flies may deposit eggs. In case any maggots are found, there is no better application than common crude petroleum, or whale oil, both of which are repulsive and fatal to fly and maggot. A sheep that is "struck" with maggots will remain separate from the flock, and may be lost sight of unless the flock is counted at least once a day, and the straggler found. Weaning time, when the ewes may suffer from caked udder, is an especially critical period, and then extra watchfulness is called for.

Diseases of the Feet.—Sheep are subject to many disorders of the feet. The structure of the sheep's foot is different from that of the horse. It possesses no laminæ which connect the outer crust or horn with the sensitive parts within, but the crust is connected with the bone by a vascular structure, by which it is also secreted. The growth of the hoof of the sheep is not from the coronet downwards, as in the horse, but from the whole inner secreting surface. In this lies both the weakness of the sheep's foot and the rapidity with which repairs are made when it is injured or diseased. The wall or crust surrounds the outside of the foot, and turns under at the edge of the sole and toe, and it is impossible to distinguish where the crust ends and the sole begins, both being so much alike in structure. The crust is harder and

tougher than the sole, which is soft and elastic, like India rubber. As the foot wears down by contact with the ground, the crust is worn off to a sharp edge upon the outer margin; when the wear and growth balance each other, the foot is in perfect condition; but when either is greater than the other, the conditions of disease are at once established, and unless removed by proper treatment, lameness occurs.

Another peculiarity of the sheep's foot is the interdigital canal, which commences in a small opening about one inch above the foot, passes downwards and backwards between the toes and ends in a pouch which is curved upwards upon itself. The canal is covered with hair, and is studded with glands which secrete an oily fluid. This fluid overflows at the opening, and moistens the skin between the toes, preventing chafing and soreness. The peculiar structure of the foot of the sheep, under unfavourable circumstances, gives occasion to several serious diseases. Of these the most frequent and important is

Foot-Rot.—This disease is contagious, and may spread through the flock, if preventive measures are not taken. It consists of an inflammation of the whole hoof, the formation of blisters upon the heels and between the toes, which break and form discharging surfaces, and, in a few days, ulcers, which suppurate and excrete fetid matter. The fore feet are the most usually affected. When this happens the sheep may be observed to go around feeding painfully upon their knees. If no attention is given, the hoof is lost in course of time, and a wounded stump only is left. It is caused at first by wet pastures in which the feet become foul, the horn becomes detached under the sole, and harbours filth which softens the sole, and influences the vascular tissue beneath it. Neglect completes the conditions under which the disease occurs. The treatment should be immediate on the appearance of the first lameness, for when the ulcerative stage has arrived, the cure is long and difficult, the whole condition of the animal being involved. As soon as lameness is perceived, the sheep should be examined. All raw, loose, or diseased horn should be cut away with a sharp knife; any excessive growth of horn at the toes should be removed, and if any pus or matter is found beneath the horn, that should be pared away until it is all exposed. The feet should then be washed clean with carbolic soap and water twice a week, and after each washing a piece of tow or lint dipped into the following mixture should be bound on the foot and between the digits, viz.:

Oxide of Copper	4 ounces
Arsenic	½ ounce
Acetic Acid	3 ounces
Honey	8 ounces.

Or the foot may be thoroughly smeared with the following ointment, viz.:

Finely Powdered Blue Vitriol	1 pound
Verdigris	½ pound
Linseed Oil	1 pint
Pine Tar	1 quart.

This will dry on the foot and will not be washed off by the wet grass as a solution would be.

The following remedy is in general use amongst French and German shepherds:

Chloride of Mercury (Corrosive Sublimate)	15 grains
Acetate of Copper	30 grains
Sulphate of Zinc	30 grains
Hydrochloric Acid (Muriatic)	2 drams
Water	2 ounces.

The diseased parts to be touched daily with a feather dipped in the above solution. In case the disease has made considerable progress, and the sheep are found feverish and generally ailing, each sick one should receive, according to circumstances, a dose of one to two ounces of Epsom salts dissolved in half a pint of water. At the expiration of two days the following should be given, viz.:

Nitrate of Potash	½ ounce
Flowers of Sulphur	½ ounce

mixed with molasses, and placed on the tongue until swallowed. This may be repeated once a week until the feet are well.

When the disease becomes virulent, the foot is swollen, sinuses are formed, and ulceration progresses until the whole foot is deeply involved, and the sheep fails to eat, loses flesh, and is in a condition of fever from blood poisoning by the absorbed matter. The case is then often unmanageable except at a greater cost than the value of the sheep. Fortunately such a termination rarely occurs, unless through great neglect or the most unskilful management. In such a case the foot should be washed, the loose and separated horn removed with care, and the foot poulticed with a warm carrot or turnip poultice twice a day for three days, and the following should be administered at once:

Epsom Salts	2 ounces
Laudanum	1 dram.

After the feet have been cleaned by the poultice, the treatment before mentioned should be continued until recovery is made. The patient, being unable to move without great pain, should be kept in a pen with a clean floor free from straw or chaff, or anything that would irritate the foot or convey infection elsewhere.

A method recommended by the Hon. H. S. Randall, who has successfully treated many of his own flock in this manner, is to procure a large tub or

trough in which three sheep can stand at one time, and to pour into this tub a hot saturated solution of blue vitriol (sulphate of copper) until it is four inches deep. The sheep having had their feet washed, and all loose horn pared off, are placed in the tub on their feet and held there by an assistant. The first sheep is kept in the foot-bath until the fourth is ready to go in, when it is taken out; when the fifth goes in the second is turned out. Thus each sheep remains in the bath about ten minutes, giving time for the solution to penetrate every part of the diseased hoof. After the bath, the sheep are kept in a dry grass field. One application of this remedy served in every case to make a complete cure. This troublesome disease is rarely known in this country upon dry pasture, and generally yields at once to a simple paring of the feet and shortening of the overgrown toes, a cleansing from all filth or irritating matter, and a dressing with an astringent ointment such as the first above mentioned.

Common Foot-Rot or Gravel is not contagious, and being the result of accidental circumstances, is cured by their removal, together with simple auxiliary treatment. It consists of an inflammation of the internal parts of the foot, the formation of matter, its escape at the top of the hoof, the separation of the horn or crust from the diseased parts, and, as a matter of course, extreme lameness. It is caused by an excessive wear of the crust of the hoof upon stony, gravelly pastures, or by excessive growth of the crust or toe, in low moist meadows. In either case, foreign matter enters between the crust and the sole, and pressing upon the sensitive parts beneath, causes inflammation, which, not being at once remedied, increases with the above results. The means of prevention are obvious.

The treatment consists in removing the offending matter with great care and tenderness by means of the knife or small probe, as a knitting needle or wire, cleansing the foot, and washing it in astringent and antiseptic solutions, such as the following:

Chloride of Zinc	1 ounce
Water	1 quart.

Sulphate of copper or sugar of lead may be substituted for the chloride of zinc. In very bad cases the treatment for malignant foot-rot should be adopted. Removal from wet pastures is necessary to a cure, and for some time afterwards, or the trouble will quickly recur.

Epizootic Aphtha (foot-and-mouth disease), is highly contagious, and will rapidly spread through a flock. It affects the feet as well as the lips and tongue. The treatment has been already described in this chapter.

Inflammation of the Interdigital Canal.—This is of frequent occurrence when sheep are driven upon sandy or dusty roads, are pastured

on sandy lands, or are permitted to lie in muddy yards. Offending matter enters the canal and causes inflammation, which spreads to the interior of the foot, and results in swelling and great tenderness. Removal of the irritating matter by means of a small probe or the trimmed end of a feather dipped in oil, and bathing the foot in warm water and vinegar, are generally sufficient to remove the trouble. When sheep become lame, and the foot is found hot with no sign of outward cause, this may be at once suspected.

Canker of the Foot is a very obstinate disease. It consists of inflammation of the sole of the foot, which gives way to growth of spongy sprouts instead of the natural hoof, and a discharge of white curdy matter which has a most offensive odour. It is a similar disease to thrush or canker of the frog in horses. The most frequent causes are folding the sheep in yards or sheds, where the dung is allowed to collect in a mass which ferments and heats, and from neglected cases of common foot-rot or inflammation of the interdigital canal.

The treatment consists of the removal of all the separated hoof at the first and every future dressing, along with any that may appear sound, but has dead offensive matter beneath it. The foot should then be washed in a solution of one dram of chloride of zinc in a pint of water, and a pledget of tow or lint dipped in a mixture of one part of common (not fuming) nitric acid with three parts of water should be applied to the whole of the cankered surface. This should be repeated frequently until a cure is made.

Lambing and Diseases connected with it.—The number of lambs raised in proportion to those that are dropped is far less than it ought to be. Probably ten per cent. of the lambs annually dropped are lost through negligence or want of simple methods of protection. Many are lost through neglect of the condition of the ewes. The lambing season is one that calls for great patience on the part of the shepherd, rather than for great skill. A well disciplined flock, well provided with shelter and quiet retreats for the ewes, will raise a larger proportion of lambs than a neglected one. Dogs about a flock at lambing time are an unmitigated nuisance, and cause many losses. When the lambs begin to drop it is not difficult to discover those ewes that will come in, in twenty-four hours. The parts become red and swollen, and the udder swells and fills. It is at this period that the ewes need close watching, both to discover anything that may go wrong, and to render assistance when it is needed. If the ewes have been carefully tended, there is rarely any difficulty encountered that may not be overcome by simple measures, yet amongst the most carefully tended flocks there will be some occasional cases which will call for the treatment herein described as applicable to the disorders mentioned.

There is rarely any necessity for manual assistance to the ewes at lambing time. Sometimes in cases of protracted labour it will be necessary for the shepherd to ascertain if the lamb is in proper position, with the fore feet and head first; if it is, the ewe may be left alone with safety. If the position is unnatural, help should be given by an experienced shepherd. If no aid can be obtained, it is dangerous for an inexperienced person to assist, lest he may be too hasty and rough in his help. If the lamb is presented in such a manner that it cannot be expelled, it should be gently forced back again by some person with a small hand, the hand being smeared with sweet oil. It should then be gently brought into such a position that the feet shall be presented first, with the head lying upon them, and not doubled back. If the hind parts are presented, the feet should be gently brought up after the lamb has been pushed back. If the placenta or after-birth has not come away in due season, it may be gently pulled by the hand, when it will be generally expelled in a short time. If the ewe is weak, a little warm gruel, sweetened and flavoured with ginger, may be fed with a spoon or given with a horn. *It is the poor, lean, badly kept ewes which suffer most in lambing; those in good condition, or even fat, rarely experience any difficulty.*

Parturient Fever rarely attacks our native sheep, but imported sheep are sometimes subject to it. It generally occurs within a few days of lambing. The first symptoms are refusal of food, twitching of the hind legs and ears, dulness and stupidity; the head is carried down, the eyes are half closed, and a dark coloured discharge flows from the vagina. If the lamb is now dropped it is dead, but the ewe, if kept quiet and well nursed, will generally recover in two or three days. But if the lamb is not then expelled, the symptoms grow worse, the ewe suffers from fever, and moans with pain, and the discharge is very offensive. The lamb, if expelled at this stage, is in a high state of putrefaction, and the ewe falls into a condition of collapse, from which she rarely recovers. If the lamb is not expelled, the ewe dies.

The treatment should consist of the removal of the ewe from the flock to a quiet pen, on the first appearance of sickness. She should be well cared for, and fed with warm gruel of linseed or oatmeal. As soon as the dark coloured discharge occurs, the lamb is almost certainly dead, and beginning to decompose, and its removal is necessary. The vagina should be washed with warm water, and the finger, smeared with the extract of belladonna, should be introduced into the passage every three hours, until it is sufficiently dilated to allow of the expulsion of the lamb. Two tablespoonfuls of the following medicine should be given twice a day, viz.:

Calomel	8 grains
Extract of Hyoscyamus	1 dram
Linseed Tea	½ pint.

At the same time a quarter of a pint of the following should be given alternately with the above:

Epsom Salts	8 ounces
Nitrate of Potash	½ ounce
Carbonate of Soda	½ ounce
Water	2 ounces
	1 pint.

The above mixtures should be shaken up before giving them.

After the bowels have been operated upon, these mixtures are omitted and the following given:

Nitrate of Potash	½ ounce
Carbonate of Soda	½ ounce
Camphor	1 ounce
Gum Water	1 dram
	8 ounces.

An eighth of a pint to be given twice a day. The ewe should be fed chiefly upon thin oatmeal gruel and milk, or infusion of linseed. After the lamb has been expelled, the uterus should be injected with warm milk and water, or if there is a very offensive discharge, one dram of chloride of lime, dissolved in a pint of warm water, should be injected instead of the milk and water.

Abortion.—This disease is not frequent among sheep, and when it occurs can almost always be traced to the excessive use of roots in cold weather, when the ewe is heavy with lamb. It has also been known to occur in consequence of, or after, the heavy dressing of turnip or mangel land with superphosphate, the crop having been fed to the ewes, but this is probably in consequence of the greater succulence of the roots so grown, rather than the direct action of the phosphate. The distension of the stomach with cold, watery food so greatly reduces the temperature of the abdominal viscera as to destroy the life of the fœtus, which is prematurely expelled, with all the disagreeable consequences to the ewe described in the preceding paragraph. Chasing by dogs is a very frequent cause.

The treatment is preventive and alleviative. Caution in feeding of roots to in-lamb ewes in any but small quantities, or in avoiding fright, excessive exertion and worrying will prevent its occurrence. When it has happened, the following may be given with some nourishing liquid food, viz.:

Epsom Salts	½ ounce
Laudanum	1 dram
Powdered Camphor	½ dram.

The latter two only may be repeated the second day.

Garget.—This disease consists of inflammation of the udder or milk glands. It rarely occurs, except in those ewes which have lost their young and are not supplied with foster lambs, or when the teats are not opened readily by the new-born lamb, or at weaning time. If the ewe is in good condition, and has a large flow of milk, which is not drawn off, the udder becomes gorged, inflamed, and finally festers and suppurates. In this way

some ewes may lose part or the whole of the udder, and their usefulness as breeders be destroyed. It is also occasioned by allowing a nursing ewe to lie in wet and cold in the pasture or the yards. In the summer time, when the lambs are taken from the ewes and sent to market, a ewe may become gargeted, and, if neglected, may become a victim to myriads of maggots which will breed in the festering udder. Ewes are thus lost occasionally. It is obvious that prevention will be most effective. When garget has occurred, the treatment is to give a purgative and diuretic to reduce the flow of milk and any fever that may exist. This may be the following:

Epsom Salts	2 ounces
Nitrate of Potash	2 drams
Ginger	1 dram

to be given in water, and repeated in twenty-four hours. The udder should be bathed in warm water, and a solution of carbonate of soda be injected into the teats by a small metal syringe, and afterwards milked out. The disease may result in the permanent injury of the udder, or the closing of one or both of the teats, in which case the ewe should be discarded as a breeder.

Inversion of the Uterus may occur in cases of severe labour, when the ewe is weak. The womb is turned inside out, and protrudes from the body as a red bladder. From ignorance this is sometimes cut off, and the ewe destroyed. The parts should be gently washed in warm water and cleansed from all foreign matter. The ewe should then be held so that the hinder parts are raised, and with a small hand well greased with sweet-oil, or pure fresh lard, the womb should be returned, gently working it into its natural position by the thumb and fingers. The finger nails should be closely pared, lest they may wound the tender parts. A needle with a strong linen thread or fine catgut should then be passed through the skin upon both sides of the vagina, and tied so as to form a loop across it which will prevent the uterus from again protruding; twenty to thirty drops of tincture of opium should be given in some warm gruel, and the ewe left to rest upon a soft bed in perfect quiet, with her hind parts raised above the level of her head, for several days.

Ophthalmia.—This is a disease of the eye frequently caused by cold, or by grazing in stubble fields, when the straws of the barley will occasionally wound the eyes. It is perceived at once by the tenderness and redness of the organ, flow of tears, and a discharge of pus from the corner of the eye. It is readily cured by washing the eye with a solution of four grains of sulphate of zinc in an ounce of warm water, and keeping the sheep in a dark stable for a day or two. If the eye is seriously inflamed and the sheep distressed [illegible], give a dose of an ounce of Epsom salts dissolved in water, and [illegible] drops of laudanum may be added to the zinc solution above mentioned with good effect.

Castration.—This necessary operation should be performed as early as possible, as there is less danger of evil effects following it than when the lamb is older. The lining membrane of the scrotum is a continuation of that of the abdomen, and when inflammation follows the operation, it is readily communicated to the abdomen, and peritonitis, or inflammation of the membrane lining the cavity and enveloping the bowels, results, and this is generally fatal. A lamb a week old may be deprived of the whole scrotum and testicles, by one stroke of a pair of shears, without any danger or the loss of more than a few drops of blood. But when the lamb has become some months old, the organ has become fully developed as to nerves and vessels, and a more careful operation must be performed. An excellent method is for the operator to sit upon a long bench, with one of the lamb's hind legs beneath each of his thighs, the head and fore legs being held by an assistant. Taking the scrotum in the left hand, he presses the testicles towards the lower end, making the skin tight and smooth. He then makes a free incision with a sharp knife at the bottom of the scrotum beneath each testicle; the membranes which surround them are cut through, the cords and vessels which are attached to them, are scraped, not cut, asunder, and the operation is completed. To castrate a mature ram, an incision is made at the bottom of each compartment of the scrotum, each testicle being removed separately, the cords and vessels being always scraped asunder. The main point to secure is to have the wound at the bottom of the scrotum, so as to allow the pus, which will form within it, to escape. If this pus is retained in the wound, it becomes absorbed, inflammation is communicated to the adjacent parts, and a fatal termination is likely to ensue. The prevent this, a small lock of wool is sometimes left in the wound, by which it is kept open and the danger averted.

Docking.—This operation should be performed on all the lambs when a week or two old. It is then but slightly painful. The best method is to take the lamb between the knees, holding its rump closely against a block of wood. Then drawing the skin of the tail towards the rump with the fingers of the left hand, a sharp chisel is held by the right hand upon the tail, below the fingers, and two inches from the rump; a boy gives the chisel a smart rap with a light mallet, and the tail is severed at one stroke with a smooth cut which leaves the bone in a good condition to heal quickly. A pinch of powdered copperas may be placed on the stump of the tail to stanch any bleeding, and to keep off flies.

Fractures of the limbs sometimes occur through neglect to let down bars when sheep are entering or leaving a fold or field, or through other accidents. These are easily repaired by bringing the broken ends of the bone together in the proper position, and binding the limbs in splints of wood. The splints should be wrapped with strips of cloth to prevent them from

chafing the limbs, and the bandage should be made secure, but not so tight as to interfere with the circulation. The bandage should be worn three or four weeks, and if occasionally examined, there will be no need to shut up the patient from the rest of the flock. An excellent splint is made by soaking coarse brown paper in water and wrapping it around the broken limb and then binding it with bandages of muslin. When the paper dries a very firm support is given if sufficient is used.

Wounds, either punctured, incised, or lacerated, may occur from a variety of causes. When a sheep is wounded, the first thing to be done is to wash the wound with a soft cloth or sponge and warm water. If blood flows freely from an important artery, and it cannot be stanched by the use of brown sugar or powdered copperas, the bleeding end of the artery should be sought and twisted two or three times, which will usually stop the flow. A sheep will rarely bleed to death, except from a wound which severs the arteries or veins of the throat. It may faint from loss of blood, and the flow may then, or soon afterwards, stop. If the wound is a clean cut with smooth edges, it should be closed, the wool being clipped around it, and two or more stitches taken through the skin at the edges, by which they may be kept together. The stitch should be passed through the skin in two places directly opposite each other on either side of the wound; the thread should then be tied tightly enough to keep the edges in contact, but no more, and the ends cut off. Other similar stitches are to be made, and the wound is dressed upon the surface by smearing it with an ointment of tar and powdered blue vitriol. If the wound is punctured and deep, it should be dressed by injecting with a syringe a few drops of compound tincture of benzoin, and inserting in it a plug of lint or tow dipped in the same. This will keep the wound open until it heals from the bottom. If allowed to close before the bottom is healed, an abscess will be formed, which will need to be opened. If the wound is in such a position that the pus formed cannot escape freely, it should be removed twice a day by means of a feather or a swab of linen at the end of a small stick, and the plug soaked in tincture of benzoin inserted. If any foreign matter, such as a splinter of wood, remains in the wound, it must be removed, if necessary by enlarging the wound, before it can heal. A wound that is difficult to heal from its depth and narrowness may sometimes be made more tractable by opening and enlarging it at the top. Lacerated wounds will need to be treated as both incised and punctured wounds. Where the torn parts can be brought together, stitches should be made, and where the flesh is separated from the surrounding tissue, the fragments may be cut off. The deeper parts should then be treated as punctured wounds. Such wounds are long in healing, because skin is reproduced only from the edges of the sound surface. As many of the lacerated portions of skin as possible should be

brought together, so as to form edges from which the new growth may start. It will be a question if the value of the sheep in this case will repay the time and labour spent in treating it. If not, to take its skin at the outset may be the most advisable course. To cure a large wound in the fly season is a work of much trouble.

Sprains are not uncommon accidents in a large flock. They are reduced very easily by rest and the use of a liniment such as

Olive Oil	1 pint
Ammonia Water	2 ounces.

Diseases peculiar to Lambs.—Lambs frequently fall victims to some diseases which seem to affect them more virulently than they do grown-up sheep, or else the young animal, having less strength or vitality than the mature one, more easily succumbs to those diseases. In its earlier life it is also affected with some disorders peculiar to its condition. These diseases call for special treatment. The most troublesome ailments to which lambs are subject are those of the digestive organs, and chief amongst these is

Diarrhœa, or "White Scours."—In the unweaned lamb diarrhœa takes the form generally known as "white scours." This appears as a liquid discharge of a white colour, which is simply the passage through the bowels of undigested milk. It is caused by a change in the quality of the ewe's milk, which is not coagulated in the lamb's stomach, and remains as an irritative agent, exciting the bowels to undue action, by which the milk is discharged soon after it is swallowed, almost without change. The food of the ewe probably has much to do with this, as the trouble is most frequent when the owe is fed upon rank, succulent, watery herbage, or an excess of roots. When this cause does not exist, it arises from a disordered condition of the lamb's stomach. When the former cause is suspected the ewe should be treated. The food should be changed to other kinds of a more solid and nutritious character. A poorer pasture should be provided, or hay be given for a few days, along with some crushed oats and corn, or malt, linseed, cotton-seed meal, bran, or peas. The lamb should receive the following daily until recovered, viz.:

Linseed Oil	1 teaspoonful
Essence of Ginger	5 drops.

When the cause exists within the lamb, two teaspoonfuls of the following astringent mixture may be given night and morning, after the before mentioned has operated, viz.:

Prepared Chalk	1 ounce
Powdered Catechu	4 drams
Powdered Ginger	2 drams
Powdered Opium	½ dram
Peppermint Water	1 pint

to be mixed. Shake before administering.

Sometimes the discharge consists of a pale, greenish liquid, similar to whey; this is the result of indigestion, as the food of the lamb taken in excess is coagulated in the stomach, and accumulates sometimes to several pounds in quantity. When this occurs, in addition to the looseness and colour of the dung, the lamb is dull, walks moodily behind the ewe with its head drooped, and the abdomen is hard and swollen. The following should then be given twice, viz.: carbonate of magnesia, half ounce, mixed in water, to be followed by half an ounce of Epsom salts in a teacupful of water, after which the astringent medicine should be given. This course of treatment should be followed in case of the "*green scours*," which may happen after weaning, when the lamb is turned upon clover pasture. Sometimes the presence of worms in the stomach and intestines will cause a looseness of the bowels. In such a case the discharge from the bowels will be mixed with slime or mucus. The treatment should then be as follows: give to a year-old lamb

Linseed Oil	1 ounce
Powdered Opium	3 grains
Starch	1 ounce

mixed in boiling water to make a draft. A teacupful of rice water should be given twice a day. The above to be repeated the second day. After the irritation of the bowels is removed give the following:

Linseed Oil	2 ounces
Spirits of Turpentine	4 drams

to be repeated weekly for a month if considered necessary.

Constipation.—When this occurs the dung is scanty, and at long intervals passes in lumps, which are glazed and hard. There is pain at the times of discharge, which is evinced by the arching of the back and peculiar but expressive actions of the lamb. The treatment consists in injections of warm water, with two or three half-ounce doses of linseed oil, given at intervals of six hours. The food should consist of oatmeal or linseed gruel, sweetened with molasses; if it will not be taken in that way, it should be given by means of a horn.

Spasmodic Colic produces severe pains, occurring in paroxysms. The lamb falls and struggles, or remains with eyes fixed, as if convulsed. It is generally an accompaniment of constipation, and always of indigestion. The treatment is to give the following mixture, viz.:

Tincture of Rhubarb	1 dram
Carbonate of Soda	1 dram
Warm Water sweetened with Molasses	2 ounces.

This should be administered slowly with a spoon. After the spasms are relieved give half an ounce of linseed oil.

Paralysis.—This disease may occur through a severe chill or exposure to

cold rains, or as a symptom of chronic indigestion from inaction of the stomach. The latter is to be suspected when the appetite is depraved, and sand, earth, and coarse matter is eagerly swallowed. In the former case a warm bath, with friction upon the spine with spirits of turpentine or ammonia water, followed by a few days' nursing, may be found useful. In the latter case the symptoms and *post mortem* appearance show that the base of the brain, the spine, and the nervous system proceeding to the stomach are affected. The lamb suffers severely, as if in great pain. It is unable to rise upon its hind legs, and is convulsed with spasms; the teeth are ground together, and the breathing is quick and hard, and death generally results. The only definite directions that are likely to result favourably are to prevent the disease by watching the condition of the lamb after it is weaned, and to provide such food as shall keep it in a thriving condition. Poverty of blood being the direct cause, any treatment that will avoid that condition will be helpful. A small quantity of linseed-cake-meal, bran, or ground oats, should be given daily after weaning, and until the first winter is past. Lambs of rapidly growing breeds cannot endure stinting in food; the demands of their constitution must be supplied to its full capacity, or the health suffers, and instead of becoming simply poor and stunted, they become diseased. Disease thus induced cannot be expected to submit to medicine, and the only natural remedy is apt to be applied too late to be of service.

Pale Disease, Husk, Verminous Bronchitis.—This disease consists in the presence of worms in the air-passages of lambs. These produce great irritation and violent coughing. The interruption thus resulting to the aëration of the blood in the lungs causes general disturbance of the system. The appetite fails, the condition rapidly falls off, and *anæmia*, "pale disease," or "the bloodless condition," takes place, beneath which the lambs rapidly sink. How the worms, in large numbers, find their way into the air-passages of so young animals is a query which as yet cannot be satisfactorily solved. They are there, however, and that fact must be sufficient for the shepherd. These worms are a species of *strongylus* or thread-worm, closely akin to the fatal "gape-worm" (also a *strongylus*), which destroys so many young chickens. It is the same species which inhabits the lungs and bronchial tubes of the sheep. The lamb, being less robust, is carried off with greater ease by these attacks than the full-grown sheep. Prevention is the best remedy. Lambs should not be allowed to follow sheep upon the same pasture, nor to pasture upon meadows that have been topdressed with manure from the sheep stable or yards. No medicine can reach the lungs except through the blood, and but few affect them in this way. Sulphur, turpentine, and assafœtida are in part exhaled through the lungs, and these medicines alone can be depended upon to reach these parasites.

The treatment recommended, therefore, is to administer the following, viz.:

Linseed Oil	½ ounce
Spirits of Turpentine	½ dram
Asafœtida	20 grains

to be given early in the morning, for three successive days, before feeding or turning to pasture, and no feed to be given for three hours afterwards. Afterwards the following to be given daily:

Molasses or Honey	1 pound
Flowers of Sulphur	4 ounces

One tablespoonful to be given every morning for ten days.

The food should be of the most nutritious and digestible character, and if the appetite fails, the food, until the appetite returns, should be given by means of a horn, in the shape of gruel or infusions of oatmeal, linseed, or cornmeal, sweetened with sugar.

TABLE OF APPROXIMATE EQUIVALENT MEASURES.

For the more ready use of the prescriptions mentioned in the preceding chapter, the following table of approximate equivalent measures is here given:

FLUID MEASURES.

One teaspoonful = One fluid dram.
One tablespoonful = Half a fluid ounce.
One wineglassful = Two fluid ounces.
One tea (*not* coffee) cupful = A quarter of a pint.
One tumblerful = Half a pint.

It will be more convenient, as well as more accurate, to have an apothecary's graduated glass, which is not very expensive, and will allow all the needed measurements to be made in a single utensil. This is a conical glass upon a foot, and provided with a lip to pour from; they may be had the capacity of one or two ounces up to a pint; one of four ounces will be the most convenient; the measures are marked on the glass, the sign f ʒ standing for fluid dram, and f ℥ for fluid ounce; Ss is used for half of either.

A set of apothecary's scales and weights may be bought for a dollar or less. The grain weights are of thin sheet brass, with number of grains indicated by dots. ℈ stands for scruples, and ʒ for dram; the number of each being indicated by numerals following the sign; Ss is used for half of either.

Management of Sheep.

In the management of sheep, how to procure the most profit from the flock is the greatest consideration. It is not exactly how to increase the flock most rapidly, nor to produce the heaviest carcasses or fleeces, but to produce such animals as will return the most money for the expenditure and labour involved. In some localities the sale of an early lamb will bring in more money than that of the mother with its fleece. Where there is a market for lambs, it is evidently the most profitable to keep such sheep, and to keep them in such a way, as will produce the highest priced lambs. Where mutton is the most profitable, there a different management must be adopted, and frequently a different breed of sheep must be kept. Where wool only is the object, still another different course will be chosen. Whichever end is to be gained, the care of the breeding ewes and the lambs will be a subject of much solicitude. But what would be a proper course in one case would not be at all proper in another. A few general principles are involved in the management of ewes and lambs, which will first be explained, after which the special management proper to be adopted for each special case will be considered.

The period of gestation of the ewe is 150 to 153 days. Five months in round numbers may be taken as the period during which the ewe carries a lamb. The coupling of the ewes and rams should be so timed that the lambs may be dropped at the most desirable season. A ewe that produces a fine, large, active lamb, that is a good nurse, and that rears a profitable market lamb, or that rears twins successfully, is a valuable animal to retain in the flock so long as she remains productive. Such ewes have been kept until ten, twelve, or even sixteen years old, and to be able to identify a ewe of this kind is very necessary when the greatest profit is the object sought, and more especially in those cases when the special business is to rear market lambs, or increase the flock rapidly. No more than thirty ewes should be apportioned to one ram in any season, unless he be a full grown one, and in vigorous health, and it would be well to observe the rules laid down in a succeeding chapter especially devoted to breeding, for the management of the ram at this season. If the ram is equal to the work, fifty ewes may be given to him, but it is better to err on the safe side in this matter, as overwork simply means barren

ewes and loss of lambs. At the breeding season the ram should be smeared upon the brisket every day with a mixture of raw linseed oil and red ochre, so that he will leave a mark upon each ewe that may be served. As the ewes are served they are to be drafted from the flock and placed in a field or yard by themselves. Two rams should not be kept together in a small breeding flock, as quarrelling and fighting are certain to result, and great damage may occur. If two rams are necessary, each may be used on alternate days. Wethers are a nuisance in a flock of ewes at this season, disturbing them, and keeping them and themselves from feeding. A plan followed with advantage where the flock consists of heavy bodied sheep, and where the necessary attention can be given, is to keep the ram in a yard or paddock by himself, out of sight of the ewes, and to allow a wether to run with them. As each ewe comes in season, the wether singles her out and keeps company with her. On the return of the flock from the pasture at night, the ewe or ewes in season are turned into the ram until they are served, when they may be removed at once, or left with him until the morning. In the morning, if any ewes have come into heat during the night, they may be served before the flock is turned into the pasture. This is continued until it is known that all the ewes are in lamb. By this method a ram may be made to serve double the number of ewes that he would if allowed indiscriminate access to them, and exhaust himself in useless and needless repeated exertions.

As soon as the ewes have been served, the time of each is entered in the record as previously described. They are carefully preserved from all worry by dogs and needless driving or handling. Peace and quietness at this season will tend to the production of quiet and docile lambs. The shepherd should make himself very familiar with them, and by giving salt or meal in the hand, or a small dish, reduce them to a condition of perfect docility. Any ewes that have either refused the ram or have failed to breed should be dosed with two ounces of Epsom salts, and be stinted in their feed for a few days to reduce their condition. This will generally be effective in bringing them into season. Good fair condition is better than an excess of fat, but ewes in poor condition cannot be expected to produce other than poor, weak lambs; neither will an excessively fat ewe produce a strong lamb. Some extra food will now be needed by the ewes, and should be given at first in small quantities. Bran, crushed malt, and crushed oats and corn mixed are the best kinds of food. Oil-cake, either of cottonseed or linseed, unless used with great caution, is not always a healthful food for ewes in lamb. Any food that actively affects the bowels, either way, is to be avoided. Half a pint a day may be given of the first mentioned foods, and a change from one to another may be frequently made. So long as pasture is to be had, this allowance will be sufficient. When the winter feeding commonces, the ration of grain should be gradually increased until, at the period when the lambing

time approaches, a pint daily is given. Cold watery food is highly dangerous at this time, and roots should not be given in large quantities, nor at all unless pulped and mixed with the cut hay and the grain. Turnips or other roots that have been highly manured with superphosphate of lime have been said by several experienced English breeders to be productive of abortion. Water should be given in small and frequent quantities. It is best to have running water or water from a well always at hand for the owes. If the ewes have not heretofore been kept apart from the rest of the flock, they should now be separated. The general treatment of the ewes up to this time should be such as will keep them free from all excitement, and in good healthful condition. The record should now be consulted, and as the ewes near their time they should be removed into a part of the stables or sheep barn, where each one can have a small pen to herself. These pens should be made so that light can be shut out if desired. Here they are permitted to drop their lambs in perfect quiet; by this means few ewes will disown their lambs, and no lambs will be lost by creeping into feed racks or out of the way places. The pen should not be larger than 5 x 4 feet. As soon as the lamb is dropped, and the ewe has owned and licked it, and the lamb has once sucked, all danger, except from gross carelessness, is passed. The ewe will be greatly helped by a drink of slightly warm, thin oatmeal gruel well salted. The lamb will be benefited by a teaspoonful of castor oil, given in new milk, if the first evacuations do not pass away freely. These are apt to be very glutinous and sticky, and, by adhering to the wool, to close the bowel completely unless removed. Warm water should be used to soften and remove these accumulations. The anus and surrounding wool should then be smeared with pure castor oil. If the lamb is not sufficiently strong to reach the teats and suck, it should be assisted once or twice. Any locks of wool upon the ewe's udder, that may be in the way, should be clipped. If the lamb is scoured, a teaspoonful of a mixture of one pint of peppermint water and one ounce of prepared chalk should be given every three hours, until it is relieved. When the ewe refuses to own the lamb, she may be confined between two small hurdles. Two light stakes are driven in the ground close together to confine the ewe's head and keep her from butting the lamb. If she is disposed to lie down, as some obstinate ones will do, a light pole is passed through the hurdles resting on the lower bar beneath her belly. Thus confined during the day, she is helpless, and if the lamb is lively, it will manage to get its supply of food. The ewe should be released at night. One day's confinement is often sufficient to bring an obstinate ewe to reason.

A twin lamb, or one deprived of its dam, that may need to be reared by hand, may easily be fed upon cows' milk. A fresh cow's milk is the best fitted for this purpose. Ewes' milk is richer in solid matter than that of the cow, and the addition of a teaspoonful of white refined sugar to the pint

of cows' milk will make it more palatable to the lamb. At first not more than a quarter of a pint of milk should be given at once. The milk should be freshly drawn from the cow, and warmed up to 100 degrees before it is fed. A convenient method of feeding milk to a lamb is to use a small tin can with a long spout, such as is used for oil. An air hole is punched in the cover or cork, and a piece of sponge covered with a cloth is tied upon the end of the spout. The flow is thus made easy and equal, and the lamb sucks in a natural manner. A very short time is sufficient to familiarize the lamb with this kind of foster-mother. To encourage the flow of milk in the ewe and the corresponding growth of the lambs, the food of the ewes should be of the best character. Clover hay, bran, and crushed oats, with some peameal, are the most preferable foods, producing a rich milk in abundance. The ewes must not be allowed to fall off in condition, or the lambs will fail. During mild weather, sugar beets may be given in moderate quantity with advantage, but mangels or Swede turnips (rutabagas), should be avoided as too watery and deficient in nutriment, and productive of scours in the lamb. In cold weather roots are apt to reduce the temperature of the animal too suddenly if given in any but small quantities, and consequently decrease the flow of milk. Pea straw is a favourite and nutritious food for sheep, but it will be found profitable to give only the very best at hand to nursing ewes. The after growth and condition of the lambs will greatly depend upon the maintenance of a thrifty and continuous growth during the first three months of their existence.

At the age of a week the operations of docking and castrating the male lambs may be safely performed. At this age the young animal suffers but little; there is no loss of blood, and the wounds heal by the first intention. The rough and ready method of clipping off the tail an inch from the rump, first drawing the skin upwards, and of clipping off the scrotum and testicles altogether with a pair of sharp sheepshears, will be found perfectly safe if done before the lamb is two weeks old. The nerves being very slightly sensitive at this time, the painful and, when later performed, dangerous operation of emasculation is only slightly felt, and within an hour a lamb bereft of tail and generative organs will frequently be seen skipping playfully in the sunshine. To dock an older lamb is a more troublesome operation. To do this with facility, a block of wood about a foot high, a sharp, broad chisel, and a wooden mallet are required. The operator stoops with bended knees, the block being in front of him, takes the lamb with its head between his knees and its tail in his left hand, holding the chisel in his right hand. Backing the lamb's rump up close to the block, he lays the tail upon it, and drawing back the skin of the tail up to the rump, holds the chisel lightly upon the tail close to and below the fingers of the left hand. When all is ready he directs an assistant to strike the chisel smartly with the mallet,

by which the tail is instantly severed about two inches from the root. A pinch of powdered bluestone (sulphate of copper) is placed on the wound, and the lamb is released. To castrate an old lamb with safety, the scrotum should be opened by a long free incision with a sharp knife at the lower point, the animal being at the time turned upon its back and secured in that position. The scrotum should be held in the hand tightly enough to keep the skin tense. The cut should be made only through the skin and coats of the testicle, and not into the gland, by which a great deal of pain is spared to the animal. The gland will escape from the scrotum at once if the opening is made large enough. It may be taken in the left hand and the cord and vessels scraped apart, *not cut*, by which bleeding is prevented and healing made more certain and rapid. The opening being made at the bottom of the scrotum, allows the blood and any pus that forms in the wound, to escape freely. It might probably be beneficial to insert a small plug of tow in the wound, projecting out of it a short distance, to prevent the edges from healing until the inflammation has subsided. This method of operation is a safe one, and if it is neatly done, the losses need not be 1 per cent, while frequently three lambs out of five may be lost by any other method.

While the lambs are still with the ewes, and although the ewes may be well fed with a special view to the thriftiness of the lambs, yet a supply of additional food for the latter will be of great advantage to them. To furnish a young animal with all the food that it can digest, and that of the choicest character, is to create a sturdy, thrifty, strong constitutioned animal that will be prolific in reproduction and long lived. To advance the maturity of an animal is also to lengthen its life, for it matters not at which part of its productive career we add a year, it certainly, so far as profit is concerned, lives a year longer for us. If a yearling ewe can be made to produce a healthful, strong lamb, or a lamb can be brought by care to maturity for the market at eighteen months instead of thirty months, this result is simply equal to a profit of 40 per cent. And feed is the agent by which this profit is secured; of course made available by proper care in selecting the breeding stock.

As lambs progress towards the period for weaning, the extra food should be gradually increased, unless they can be removed to a good pasture of short, tender grass. The weaning should be very gradually done. The sudden removal of the lambs from their dams is injurious to both. It too abruptly deprives the lambs of their most easily digested and most agreeable food. It forces them to load the stomach with food for which it is hardly yet prepared, and suddenly arrests their growth, both by a stinting of food and by the nervous irritation consequent upon their sudden deprivation. The dams, in full flow of milk, deprived of the means of relief, are subjected to the engorgement of the udder, with the consequent congestion of all the organs connected

therewith. This shock is very injurious, and frequently produces inflammatory disorders of the blood or garget. To avoid these ill effects of the sudden change, it is well to remove the lambs to a distant pasture, along with some dry ewes or wethers for company. The novel experience of a fresh pasture will cause them to forget their dams, and they will utter no complaints nor manifest any uneasiness. At night they should be turned into the fold with the ewes, whose full udders they will speedily relieve. By withdrawing any extra feed hitherto given to the ewes, somewhat gradually (in no case is it wise to make a sudden change in the management of sheep), their supply of milk will gradually decrease, and in two weeks the whole of the lambs may be weaned with perfect safety to themselves and the ewes.

After having been weaned, the lambs should have the first choice of pasture and the best and tenderest cuttings of the fodder crops. Many farmers have found it advantageous in every way to turn newly weaned lambs into a field of corn in the month of August. The corn is too far grown to be injured, the suckers only will be nibbled by the lambs, and the weeds which grow up after the corn is laid by, will be eaten closely. The lambs also have the benefit of a cool shade, and where such a field can be conveniently applied to this purpose, there are several reasons why it might well be done.

The condition of the ewes must not be neglected at this time. The chief danger is in regard to those that are heavy milkers. Such sheep should be closely watched, and the milk drawn by hand from those whose udders are not emptied by the lambs. The first approach to hardness or heat in the udder should be remedied by an immediate dose of an ounce of Epsom salts dissolved in water, and mixed with a teaspoonful of ground ginger. The next two days twenty grains of saltpetre should be given, each morning and evening, to increase the action of the kidneys. These remedies will generally relieve the udder, and will tend to greatly reduce the secretion of milk. If hay is given in place of grass, and the ewe confined in a cool, darkened pen, the drying up of the milk will be hastened.

As the improvement of the flock can be better made from within than by giving the sole attention to bringing new blood from without, it will be very important to select the best lambs, both of rams and ewes, for breeders. The selection should be made chiefly in reference to the purposes for which the flock is kept; and strength of constitution, rapidity of growth, size, tendency to fat, fineness, length, or quality of wool, and prolificness and certainty of breeding in the parents as well as, so far as can be judged of, in the lambs themselves, should be made the tests by which the selection is determined. If the production of early lambs for market is the object, the produce of those ewes which bring single lambs of large size and quick growth will be chosen to increase the flock; if the production of mutton sheep, then those lambs from ewes which drop twins, and are good nurses, ought to be kept; and if

wool of any particular kind is desired, then, the selection should be made chiefly in reference to that. On no account should weakly lambs, or those ewes which are poor nurses, or fail to breed, or which exhibit tenderness of constitution, or are wanderers, or of uneasy, restless dispositions, be retained; but such unprofitable animals should be closely weeded out and fattened for sale or for slaughter. The choice of ram lambs is of chief importance, for the influence of the ram runs through the flock, while that of the ewe is confined to her produce alone. To select a lamb for a stock ram is a matter requiring a knowledge of the principles of breeding, and some tact and experience.

The proper age for breeding differs with the class of sheep bred. The Merino is not mature enough for breeding until fully two or three years old. Other breeds which mature more quickly are ripe for breeding as yearlings, but there is nothing gained by suffering any sheep less than a year old to reproduce. A young ram in its second year may be allowed to serve a few ewes, if he is vigorous and well grown. A ram at two years may serve thirty ewes in a season, and after that from fifty to sixty or seventy, according to the manner in which he is kept, and if he is restricted to no more than one or two services of each ewe. The strength and vigour of the lamb certainly depends on that of the ram by which it is sired, as well as on the condition and character of the ewe. Ewe lambs of less than a year old should be kept in a separate flock by themselves where they may not be disturbed by the rams. The second year they are capable of breeding, and if they have been well cared for, will produce as large lambs and as many twins as older sheep. The young ewes having their first lambs are apt to be nervous, and need careful attention at yearning time; it is then that the great convenience resulting from having a docile and friendly flock, well acquainted with, and confiding in, their shepherd, is manifest. The young ewes should not be put to the ram until the older ones are served, so that they will not drop their lambs until spring is well advanced, and the pressure upon the shepherd becomes lighter. As a rule they are poor nurses, and if the season is cold, will lose many lambs. If they are not allowed to have lambs until April or May, so much the better; it will then be necessary to keep them from the ram until November and December. Difficulty in parturition is sometimes experienced with young ewes, and assistance is often needed. This should be given with the utmost gentleness and tenderness. When the presentation is all right and natural, and the fore feet appear, but difficulty occurs in ejecting the head, a very slight and slow drawing upon the feet may help the ewe in expelling the lamb. Sometimes in her nervous struggles the head may be turned backwards, and does not appear when the fore legs have protruded. In this case the lamb should be gently forced backwards, and the hand or fingers, well oiled with linseed oil, and the finger nails, being closely pared, are inserted, and the head gently brought into position, when it will be expelled without further trouble. For

more difficult and abnormal presentations, the services of an experienced shepherd will be needed, but such cases are very rare, and will very seldom occur if the flock has been carefully attended to, and has not been overdriven, or worried by dogs, or knocked about by horned cattle. When a ewe loses her lamb it is best to make her adopt one of another ewe's twins. This may be done by rubbing the skin of the live lamb with the dead one, removing the dead one, and shutting up the ewe and the live lamb together in a dark pen. When a lamb loses her dam, it may be given to a ewe that has lost her lamb, or from which her lamb has been taken, or with care it may be brought up by hand without difficulty. In every considerable flock it will pay to have a fresh cow on hand at the lambing season, to fill the place of foster-mother to disowned or abandoned lambs, or to assist those whose dams for any reason are short of milk.

The diseases to which lambs are subject are but few, and those are mainly the result of carelessness in their management. The lamb, which appears so delicate and tender an animal, is really hardy, and resists much ill treatment, else with so little consideration as they usually receive, the race would soon become almost extinct. Damp and cold are especially to be guarded against in the spring, and filthy yards at all seasons. With clean pens and dry, clean bedding, they will resist the severe dry colds of a northern January, and thrive and grow while snowstorms rage, if only well sheltered. Sunshine has a remarkable effect upon lambs, and the warmth of the sun will often revive and strengthen a weak lamb that appears past relief. Extremes of damp and impure air in close pens, and bad drinking water, will produce diarrhœa and paralysis, and these are the chiefly fatal disorders to which they are subject. Constipation is produced by want of proper laxative food, and permitting them to feed on dry, withered herbage that has lost its nutritive qualities beneath the storms of a winter. If the directions as to their treatment heretofore given are followed, there will rarely be any need of remedial measures, and prevention will be found better than any amount of cure. If, notwithstanding all possible care, some weakly lambs are found to require treatment, the simple purgatives already mentioned in this chapter, viz.: a teaspoonful of castor or raw linseed oil will be found effective, after two or three doses, in removing the troublesome matter from their intestines, and restoring the bowels to healthful action. If in any case, a stimulant seems to be needed, as when great weakness and prostration are present, the safest is a teaspoonful of gin, given in a little warm water with sugar. A still more gentle stimulant and anodyne, but one very effective in prolonged diarrhœa, is prepared by adding to a pint of peppermint water one ounce of prepared chalk, a teaspoonful each of tincture of opium and of tincture of rhubarb; it is worthy of the name given it by shepherds, viz.: "lamb's cordial," and at the lambing season no shepherd should be without a supply of it. The dose is a teaspoon-

ful for a lamb a few days old, up to a tablespoonful for one of a month. Exposure to cold rains should be specially guarded against, and if by inadvertence a lamb is found chilled and rigid from such exposure, it may generally be restored by means of a bath of warm water and a teaspoonful of warm sweetened gin and water. After the bath the lamb should be gently dried, wrapped in a warm flannel, and placed near a fire or in a wooden box in a gently heated oven of a common stove. Where the flock is large and the kitchen is not within reach, the shepherd should have the conveniences of a shed and an old cooking-stove in which he can keep a fire sufficient to heat a water bath, and provide a warm bed in the oven for any lamb that may need such attention; if the flock numbers several hundred head in all, there will seldom be a day in our changeable spring seasons when there will not be one or more patients to be treated.

As the season progresses, and shearing time for the ewes has passed, the lambs will be found covered with ticks, unless care has been exercised to free the flock from this tormenting pest. These ticks are wingless, broad, plump, dark red insects, about a quarter of an inch in length, and covered with a very tough and leathery integument. The legs of the tick are short and stout, and it adheres with great tenacity to the wool. By means of a proboscis as long as its head, it pierces the skin and sucks the blood of its victim to such an excess that when numerous, they have been known to almost entirely empty the veins and deprive a lamb of life. The draft upon the vitality of lambs infested with ticks is very great, and sufficient to arrest their growth altogether. To rid the flock of these pests is therefore a necessary labour in the spring or early summer, and if need be, again in the autumn. The easiest remedy is to dip both sheep and lambs, as soon as the sheep are shorn, and again in August or September, in a decoction of tobacco mixed with sulphur. Coarse plug tobacco, or tobacco stems, which are cheaper than the leaves, and equally effective, are steeped in water at a boiling heat, but not boiling, at the rate of four pounds to twenty gallons of water. One pound of flowers of sulphur is then stirred in the liquid, which is brought to a temperature of 120 degrees, and kept so during the dipping by the addition of fresh hot liquor. During the dipping, the mixture is kept stirred to prevent the sulphur from subsiding. The dip may be conveniently placed in a trough or tub large enough to allow of the immersion of the sheep or the lamb, which is taken by the feet by two men and plunged into the bath at the temperature mentioned, where it is held for a minute or two until the wool is thoroughly saturated. The animal is then placed in a pen with a raised floor sloping on each side to a trough in the middle, along which the superabundant liquor escapes into a pail or tub placed to receive it. The method of dipping is calculated for small flocks, or for a few hundred lambs. For larger flocks, a larger tank is provided, twelve feet long, three feet wide, and four feet deep. A fenced

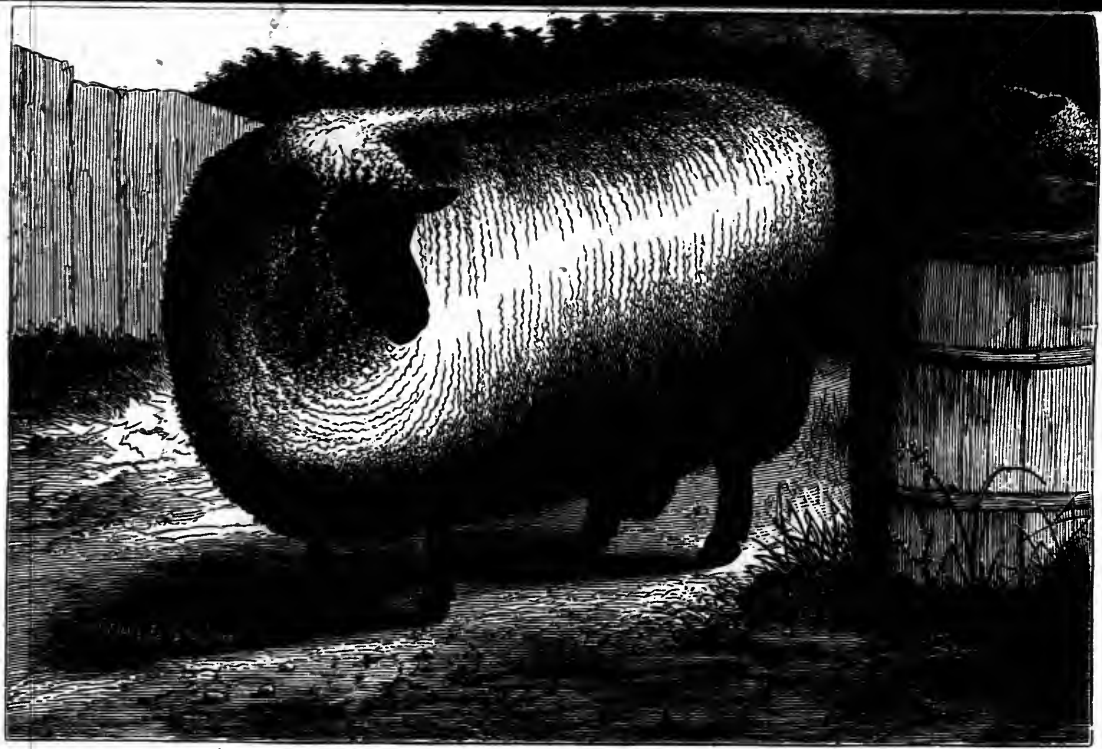
platform leads from a pen, in which the sheep are gathered, up to the edge of the dipping tank, and the sheep are taken one by one from the pen, led up the platform and pushed into the tank in which the dip is sufficiently deep to cover them. As the sheep plunge into the dip, they are seized, and kept beneath it, except the head, which alone is suffered to emerge above it. If in their struggles a little of the dip should enter their nostrils, no harm results, but the hot tobacco water is, on the contrary, often beneficial to those sheep which are affected by catarrh or grub in the head, and the violent sneezings which follow may help to free them from these troublesome parasites which often inhabit the nasal sinuses. There is no greater satisfaction to the owner of a flock, who cares for his sheep, and takes pleasure in their welfare, and in a measure loves the gentle kindly animals, and is interested in managing them so that they may enjoy all the comfort possible for them, than to know that, so far as any efforts of his are concerned, nothing is left undone that can add to their contentment, and that they are spared every discomfort and pain that it is possible to prevent.

GROUP OF SOUTHDOWN SHEEP.

Property of Hon. D. W. Smith, Boskymead Stock Farm, Bates, Ill.

GROUP OF IMPORTED OXFORD SHEEP.

The property of Mr. W. V. R. Powis, Wayne, Ill.

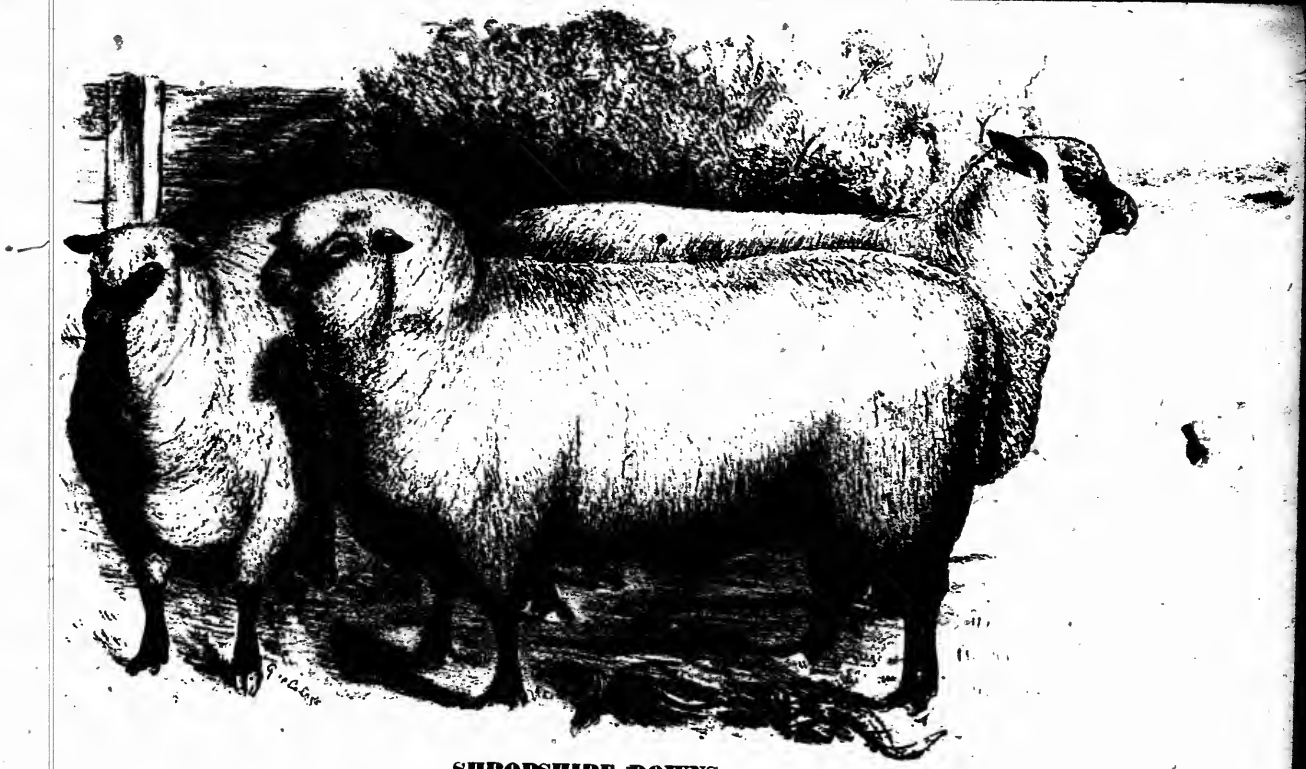


Imported **OXFORD DOWN RAM, COLOSSUS 1st,** of Wayne.

Winner of Sweepstakes at Illinois State Fair, 1885. Owned by Mr. W. V. R. Powis, Wayne, Ill., U. S.

COTSWOLD SHEEP.

The property of Mr. T. L. Miller, Beecher, Ill.

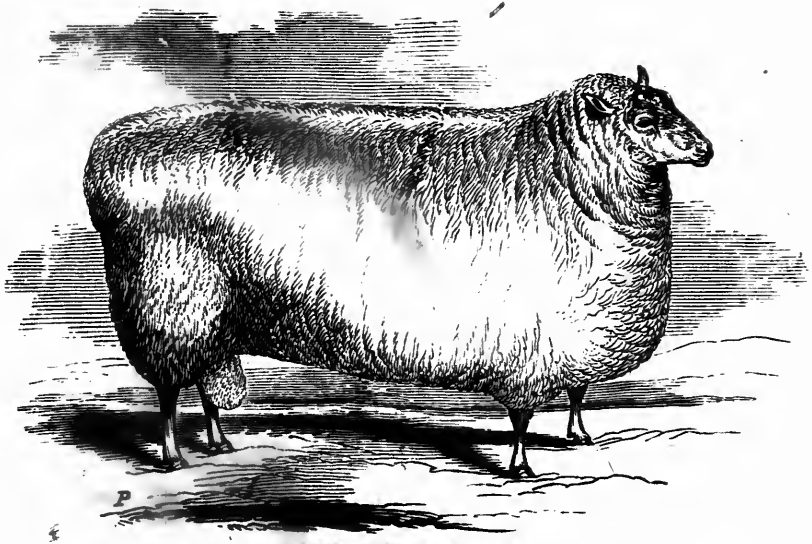


SHROPSHIRE DOWNS.

The property of Mr. T. C. Patteson, Eastwood, Ontario.

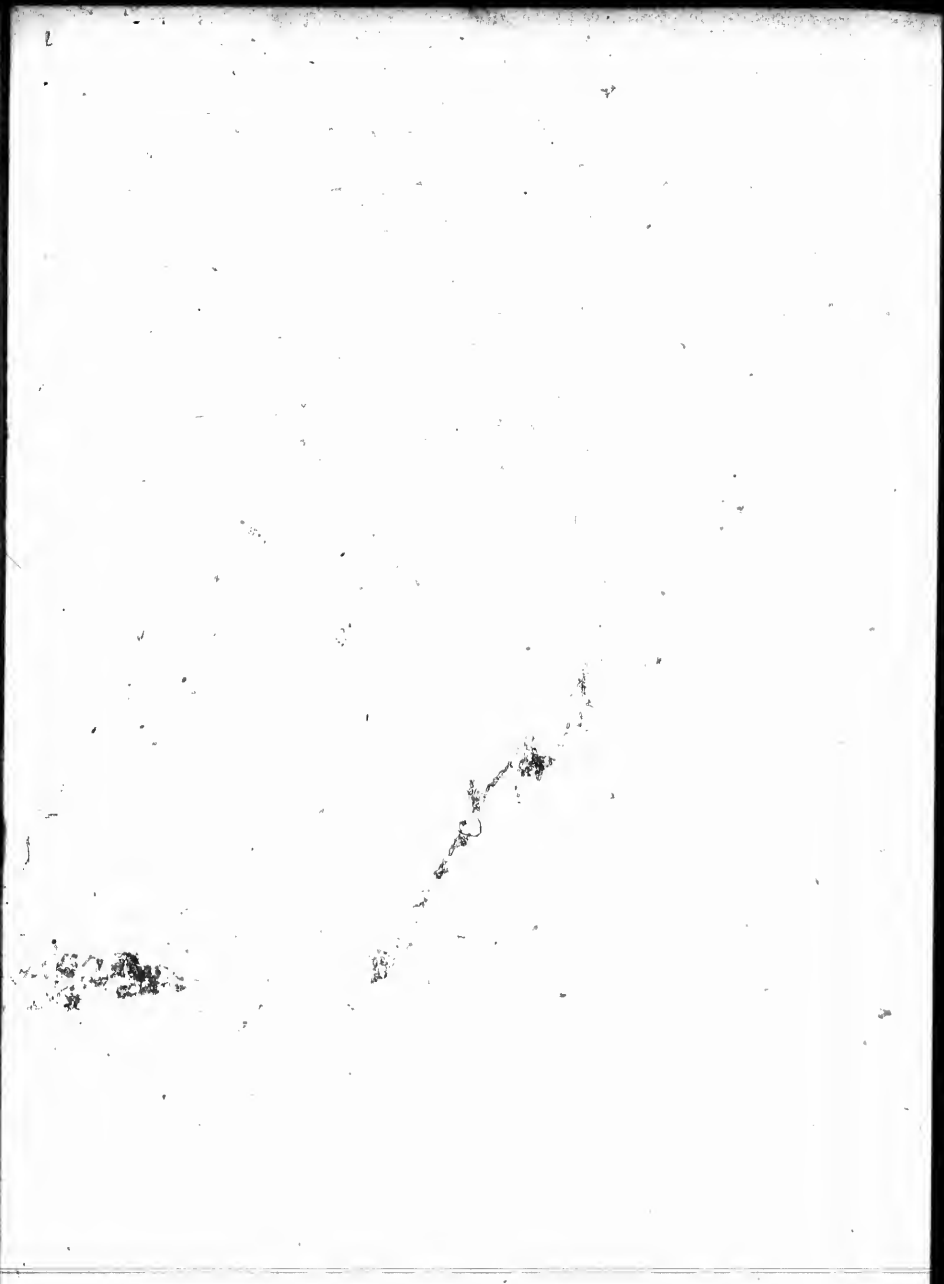
VENGEANCE.

Merino Ram. The property of Mr. H. V. Pugsley, Plattsburg, Mo.



LORD CHANCELLOR.

Imported Lincoln Ram. The property of Mr. Richard Gibson, Delaware, Ontario.



THE SOUTHDOWN SHEEP.

This handsome breed of sheep needs no introduction—for wherever symmetry in outline and perfection in detail are appreciated, the Southdown stands the peer of domestic animals of any breed. With an origin beyond the sweep of history, its merits as a flesh-producing animal have had special recognition for more than a century, during which time it has been so bred within its own blood as to perfect and intensify its best features, while being employed for the improvement of many other types claiming popular favor. Its flesh has long been deemed the synonym of perfection in its line—the ambition of fanciers of other types rarely extending beyond the standard of Southdown mutton. As a meat producer the Southdown has in its favor all of the recognized requisites. 1. Precocity—its deep chest and rounded rib insuring the fullest play of the vital organs. 2. Prolificacy—flocks wherein the lambs outnumber the ewes being by no means uncommon. 3. Propensity to thrive under average conditions—being ready for market any time from six weeks old to maturity. 4. Prepotency—its long years of pure breeding having so intensified its characteristics as to insure them prominence when crossed with other breeds. 5. Hardiness—it being found to thrive well under such treatment as the average farmer usually devotes to his stock.

Our illustration represents specimens from one of the best flocks of Southdowns in America—that of Hon. D. W. Smith, of Bates, Illinois. The trio in our illustration consists of imp. Baron Thetford, bred by Lord Walsingham, Merton, Thetford, England, got by Bristol prize ram and out of a Walsingham ewe. The two ewe lambs are Penelope 4th and Belle of Boskymead.

THE OXFORD DOWN SHEEP.

The breed originated from crossing the Cotswold rams upon Hampshire Down ewes, in 1830. The result of the cross was an animal heavier than the dam, and which resembled in fleece and size the large sire, but the wool was much finer and firmer than that of the Cotswold. The rams and ewes from this cross were bred together, and by careful selection the meritorious was preserved. Thirty-two years after, the breed having become distinct in its characteristics, it was classed by the English authorities on sheep as a separate long-wool breed.

In appearance the Oxford shows its origin. Its head is similar to that of the Cotswold, having a tuft on the forehead, but it inherits the dark legs and face of the Hampshire. Its fleece is curly and thick set, while the body is compact and placed on firm, short legs. Its handsome form, intelligent countenance, and activity, are points that render it easily recognized by those who have inspected the several breeds. The head is moderately small, broad between the eyes and nostrils, the crown being well covered with good wool. The face is brown or gray (but not specked or white) with gray spot on the end of the nose. The ears are broad, moderately long, thin, and covered with short brownish hair or wool.

The Oxford Down ram, Colossus 1st, of Wayne, and group of Oxford Down sheep, both the property of Mr. W. V. R. Powis, Wayne, Ill., are excellent specimens of this popular breed.

THE LINCOLN RAM, LORD CHANCELLOR.

This celebrated specimen is owned by Mr. Richard Gibson, Delaware, Ont. He carried off first prize at the Provincial Exhibition of Canada held at Hamilton in 1872, and was awarded similar honor at the New York State Fair at Elmira the same year. He comes from a very famous strain, and is own brother to the winner of first prize at the Meeting of the Royal Agricultural Society of England, held at Manchester and Oxford, and first as shearling in a class of fifty-two competitors at the Lincolnshire Show.

THE MERINO SHEEP.

The finest specimens of this sheep brought to America have been procured in Spain. The two excellent specimens of the breed which are illustrated on the foregoing pages are magnificent sheep. Vengeance is owned by Mr. H. V. Pugsley, Plattsburg, Missouri. He was bred by H. S. Brookins, Richville, Vermont, in 1881, and was sired by Rip Van Winkle, the heaviest shearing ram ever in Vermont, he shearing in 1882, 35⅝ pounds; in 1883, 38 pounds; in 1884, 38 1-16 pounds.

Paymaster is owned by Mr. R. T. Scott, of Pawnee City, Nebraska, and was purchased from Mr. H. V. Pugsley of Plattsburg, Missouri. He was bred by Messrs. C. H. & J. A. James, of Cornwall, Vt., in 1882; sired by Eureka, dam bred by H. W. Jones, of Vermont. He is a well marked ram with very oily fleece, of medium length, well covered everywhere, and as a stock getter was remarkably successful, getting ewes that could be equalled in style, fleece and quality by the get of few noted rams. Paymaster's second fleece, at about 360 days growth, was 27¾ pounds.

THE SHROPSHIRE SHEEP.

Undoubtedly one of the most popular breed of sheep in Great Britain at the present moment is the Shropshire. It is held in very high estimation alike in England, Scotland, and Ireland, and is found to be adapted to the varying climates of all three countries. The Shropshire is clearly composite or mixed in their origin, and it is only recently that it has been recognized as a distinct breed, and it was not until 1861, at Leeds, that it made its first impression on the minds of the agricultural public as one possessing special merit and value. In 1848 the breed was christened the "Shropshire," by Mr. W. G. Preece, of Shrewsbury, who has rendered yeoman service in establishing and spreading the fame of his favorites.

Our engraving of this popular breed represents a famous trio of the Eastwood flock, the property of T. C. Patteson, Esq., of Vanstittart House, Eastwood, Ont. This gentleman's flock is one of the finest in America, and from all sections of the continent breeders are in the habit of looking to Eastwood for choice specimens. The Shropshires being both hardy, prolific, and long lived, rank high in the estimation of Canadian farmers, and Mr. Patteson's grand flock offers them the opportunity of procuring at their own doors the purest blood in America.

Diseases of Swine.

Apoplexy.—As this is a disease which is chiefly induced by plethora, laziness, want of exercise, high feeding, and such like causes, it is not to be wondered at that it is frequent among swine; and in by far the majority of cases it is fatal, for either the animal dies suddenly without any precursory symptoms, or the progress of the attack is so rapid that before help can be obtained or remedies administered all is over. Where, however, the apoplexy does not destroy its victim in a short space of time, it may be subdued and the animal temporarily cured; but only for a while: it invariably dies soon afterwards of inflammation of the brain. Sometimes apoplexy will run, like an epidemic, through a whole piggery, and where this is the case the causes of it must be diligently sought out and carefully removed.

The precursory symptoms which prognosticate apoplexy are dulness, disinclination to move, heaviness of the head, an uncertain and staggering gait, wildness and inflammation of the eyes, with apparent loss of sight, no appetite, and general numbness. The treatment must be prompt and energetic: bleeding from the palate, Epsom salts and sulphur as purgatives, or emetic tartar dissolved in water to induce vomiting. Strict attention to diet will be requisite for some time afterwards. No stimulating food should be given; the water should be slightly nitrated, and the animal bled at least every three months.

Inflammation of the Brain.—Inflammation both of the substance and of the membranes of the brain is by no means of unfrequent occurrence, and almost invariably follows an attack of apoplexy. It is also induced by heating or exciting or indigestible food, as an overfeed of grains, or new corn, etc. The precursory symptoms are dulness, redness of the eyes, and disinclination to move; but as the inflammation becomes more intense the animal runs wildly to and fro, seems blind and unconscious where he is going, runs against everything; the pulse is small and rapid; and the breathing is slightly accelerated. The first thing to be done is to bleed, from the palate if possible; if not, or if sufficient blood cannot be obtained from there, let incisions be made in the ears, and these repeatedly washed with warm water,

which materially increases the bleeding. *Magnesia Sulphate* with ginger should be given internally as a purgative. Enemas (clysters) have also a beneficial effect, and then the animal should have repeated cooling doses of sulphur. Castor oil and jalap have been given as purgatives; and the system stimulated by the application of a blister to the throat.

Phrenitis.—This is a disease very much resembling the last mentioned, and is often called brain-fever or frenzy; it rises pretty much from the same cause; all excitants of the system, all things which tend to drive the blood to the head, will induce it. The symptoms are prostration of strength, blindness, frenzy, and often convulsions. The treatment must consist in copious bleedings and strong purgatives, which should be followed up by doses of sulphur to keep the bowels open. Croton oil with tincture of ginger has been given in extreme cases, and with beneficial effects. The dose for a moderate-sized animal is about two minims of croton oil and one dram of tincture of ginger.

Spinal Cord.—Next to the diseases of the brain follows a consideration of those arising from the spinal cord. This proceeds from the brain to the tail, and is divided by a central line on the upper and under surface throughout its whole extent, forming it into two separate columns, each of which has been proved to possess a distinct and separate function, the inferior surfaces being connected with voluntary motion, and the central ones on the upper surface with sensation.

Epilepsy.—The pig occasionally exhibits all the symptoms of epilepsy in their most frightful intensity, and whoever has carefully marked the habits of swine when not confined to the sty will easily be able to account for this; for, obtuse and stupid as it is the custom to denominate them, there is more excitability and nervousness in these animals than in many that have the credit of being more delicately organized. Note the manner in which they are affected by the approach of wind or storms—how they run about in a state of highly nervous excitement with straw in their mouths; note the sympathy and terror a whole herd will exhibit while one of them is undergoing the operation of spaying or ringing, how they squeak in concert with his cries; see them at a fair under the irritation of strange scenes and noises, and we shall find sufficient indications of a susceptibility of impression to account for swine being peculiarly subject to epilepsy.

The prognostics are constant grunting, restlessness, acceleration of breathing, pallor of the skin, and a staggering gait. Then the animal suddenly falls as if struck by lightning, and for a few moments lies perfectly motionless; after which convulsions come on gradually, increasing in intensity until they are fearful to behold; the countenance is distorted, the neck curved in every

direction, and the legs alternately drawn up to the body, and extended with momentarily increasing rapidity. The eyes protrude, the pupils are distended, and the balls roll about. The tongue is protruded and fixed between the clenched jaws; the teeth grind together, foam and saliva flow from the mouth. The pulse is wiry and small at first, then hard and bounding, and, as the intensity of the fit decreases, irregular and intermittent. Throughout the whole of the fit the animal remains perfectly unconscious, and as he recovers gets up, tries to hide himself in the litter or in a corner of the sty, and looks terrified and wild; then gradually the impression passes away, and he creeps out and begins to eat again. The seizure of one pig is often but a prelude to that of the greater number of those contained in the sty. The fits often succeed each other rapidly, two or three occurring in one day; and the cries uttered by the animals while in them are distressing in the extreme.

Medical treatment can only be resorted to in the intervals between the fits, and is seldom successful. It consists of cold affusions applied to the head, bleeding, and energetic purgatives, followed up by low diet, perfect quiet, and cooling medicines. The best way of keeping the head cool is to tie a piece of cloth about it, and then keep this constantly wet. A very efficient cold lotion for this purpose may be composed of a pint of vinegar to two quarts of water, and one ounce of *sal ammoniac*. Salts and calomel may be given as purgatives.

It is often difficult to determine what are the precise causes of epilepsy; the immediate one is generally some excitant or stimulant acting on a system predisposed by cerebral inflammation, or by intestinal irritation arising from worms, or other sources, to take on disease.

We quote a case communicated by Mr. Cartwright, of Whitchurch, to whom we are indebted for much useful information relative to the diseases of swine:—

"In 1825, I saw a pig that was taken ill in the following manner: He was a little stupid and dull, and now wandered about the sty unconsciously for a few minutes, and then appeared to be quite well; but in a few days after he became worse: he would move forwards until he came to one wall, and then retreat backwards until he came to the other wall; and made a grunting and squealing noise all the time the fit was on him, which was usually a few minutes, and sometimes longer; and he had them every quarter of an hour, and even oftener. His fits continued to increase; when he had been thus for about five days he began, after so backing himself, to fall down at full length, stretch out his legs and tumble about, and appear as if dying, and make a shrieking noise as if in great pain, and seem to be blind. His pulse was very quick and full during the fits, but subsided a great deal when they were over. He ate at intervals between the fits when food was *put* to him. He continued in this latter bad state for three or four days, and got

well in a few days after. I gave him salts and calomel during his illness, bled him in the tail and ears, and between his claws; but little blood, I fancy, was obtained from all the places; and I kept his head wet with cold water.

"About the same time a miller in this neighborhood lost five or six in a similar way, but I had not an opportunity of opening any of them."

Palsy or Paralysis.—This is by no means a disease of frequent occurrence in our own country. It is treated of by French writers, who attribute it to low, marshy situations, bad or damaged food, or the avarice of the pig-owner, who, in order to fatten the animals more rapidly, gives them highly stimulating food, which irritates the intestinal canal, and through it the spinal cord. Eric Viborg, an authority quoted by Hurtrel D'Arboval, recommends wholesome food, clean straw, a dose of common salt as a purgative, and drenches of common salt and gentian.

But there is a kind of partial palsy which is caused by the presence of parasites peculiar to the pig. M. Dupuy gives the following case which came under his observation:

"Palsy of the hind limbs, with loss both of motion and feeling, was observed in a pig eighteen months old. On carefully examining him after death, the muscles were discoloured and softened. There were in the psoas muscles numerous cysts inclosing parasites. These parasites are also found in the lungs, the liver, and the cortical substance of the kidneys.

"Between the internal surface of the cyst and the hydatid was a fine white powder, resembling pulverized bones. The spinal marrow was softened about the lumbar and sacral regions, and the membranes were slightly reddened, particularly about the roots of the lumbar nerves."

It is generally the hinder parts of the pig which are paralyzed, either wholly or partially; in the former case the animal is totally unable to rise, in the latter he totters in his gait and falls when attempting to walk. Paralysis frequently accompanies chronic disease of the digestive organs, and is attended with loss of appetite, acceleration of the pulse, and swelling of the tongue. This disease is seldom obstinate; a removal of the predisposing cause, good nourishing food, a clean and well-ventilated sty, moderate exercise, and gentle purgative or cooling medicine, will generally restore the animal to perfect health in a short space of time.

Tetanus, or Lock-jaw.—This disease, which is commonly denominated *Locked-jaw*, is by no means an unfrequent malady among pigs. The symptoms are at first spasmodic motion of the head and of one or more of the extremities, grinding the teeth and rigidity of the jaws. This is soon followed by stiffness of the neck and greater part of the frame, and an unnatural upraised position of the head. The castration of young pigs will frequently produce this disease, especially if the animal is too well fed for a few days

after the operation. It also often appears among pigs that are driven far to market, especially if when heated by travelling or exposure to the sun, they are suffered to roll themselves in ditches or streams, as they will endeavour to do. Bleeding, warm baths, lotions, etc., friction with stimulating oils, purgatives if they can be got into the mouth; if not, enemas and anodynes are the most efficient remedies. But the disease is too often fatal, and runs its course very speedily; if the animal survives the first twelve or eighteen hours, some hopes of his eventual recovery may be entertained.

Rabies.—Swine are by no means exempt from this frightful disease; there are numerous cases on record in which they have been inoculated by the bite of rabid dogs, and Hübner relates a case of inoculation from the bite of a rabid fox. The symptoms of rabies in the hog are peculiarly interesting at times, from the resemblance many of them bear to those of the human being. At first there is dulness and indisposition, and the pig is continually licking the bitten part. Subsequently some are exceedingly ferocious, snapping at everybody, gnawing everything which comes in their way, dashing themselves against walls, or leaping over all obstacles. Others, again, are dull, stupid, refuse their food, stagger when they attempt to rise, and are paralyzed in the hinder parts. There is no absolute dread of water, but evident inability to drink. An animal that we saw went to the trough, smelt at the food, and brought his nose nearly in contact with it, then started back, trembled violently, and elevated his snout high in the air. Once or twice he attempted to take portions of meat or vegetable from the wash, but the attempt was always accompanied or followed by universal rigor and shuddering, during which the food was dropped from the mouth, evidently proving that the organs of deglutition were powerfully affected.

The animal is in a highly nervous state, and the sensibility of the skin is so excessive that even if his mother licks him he screams with agony, and buries himself in the litter, uttering shrill squeaks on the approach of any one, or springs up into the air if he hears a loud noise, and falls down again in convulsions. There is in general no great secretion of saliva in these animals, and the delirium which characterizes rabies in the dog is rarely seen, or when met with is less evident and distinctive.

And yet this disease has been but little studied in pigs. Mr. Pritchard, V.S., of Wolverhampton (Eng.), gives the following interesting account of some cases he met with:

"A rabid dog entered the farmyard of Mr. George Strongitharm, of Calderfield, near Walsall, on the 27th of December, 1835, and attacked some pigs, which, making a considerable noise, aroused Mr. Strongitharm and his servants from their beds, and they proceeded with their guns already loaded, discovered him, and succeeded in destroying him. Two of the pigs had

evidently received wounds in their noses from the dog, which soon got well, no curative or preventive measures being had recourse to, and without much irritation or swelling taking place. After a fortnight had elapsed, nothing outward being observable in them, they were again turned into the yard to their old companions.

"A day or two after, on the entrails of a sheep being thrown to the pigs, all came and partook of it except the two that had been bitten. One of these was found dead in the litter, with a quantity of froth and slaver about his mouth; the other, in coming out of his bed into the air, immediately jumped up on all four legs like the bound of a deer, a yard at least from the ground, and threw from his mouth a portion of thick slaver and froth. Upon being again placed in his sty he was much convulsed, and made a shrill squeaking noise; his mouth was filled with saliva, and held continually open, nearly half-an-inch, except when champing his under jaw, which he frequently did with considerable twitching of the superficial muscles. He refused to eat or drink, gradually got worse, and died on the third day.

"Three weeks after, another of the pigs was taken ill. The symptoms were much the same. The effect of water was tried, and upon being thrown upon him caused him considerable distress, so that he leaped into the air and dashed his head against the wall, appearing quite delirious. He died on the second day. Not long afterwards another pig was attacked, the symptoms being similar to those in the former cases, only more violent; he died twenty-four hours afterwards, nothing having been done to disturb him. None of the pigs ate or drank anything after they were first taken ill."

And the case we are now about to quote was communicated by Mr Heaton, a human surgeon:

"About May, 1829, while visiting a patient I was told that in a sty at the bottom of the yard there was a mad pig. Thither I repaired, when I was informed by its owner that the animal had been bitten about three weeks before by a strange dog, which had passed through the yard, and who was at the time, by those who saw it, declared to be mad: the dog appeared to be greatly alarmed and proceeded with swiftness; it was afterwards seen for the last time in some fields at the outskirts of the town. From the statement of the man it would appear that, on the morning of the day previous to that on which I saw the pig, the animal began to exhibit symptoms of great oppression at the præcordia; to this succeeded gradual inability to stand, fearful cries, and general uneasiness when disturbed, foaming at the mouth, and a disposition to eat whatever came in the way, etc. At six o'clock in the afternoon of the second day I first saw it, covered with straw and apparently quiet, until the rattling of the sneck of its door seemed to awaken the most painful apprehension, and its mental agony seemed almost insufferable. The sense of sight seemed no less acute than that of hearing, which was mani-

fested by the animal's convulsive efforts to hide even its head beneath the straw; this accomplished it became somewhat tranquil, and was constantly devouring its own litter, excrement, etc. Its eyes had the suspicious glance of those of a phrenetic patient, its breathing was preternaturally quick, and its efforts to stand wholly abortive. In this state it continued two hours, when half a pint of train oil was attempted to be poured into its mouth, the greater part being wasted, and the animal instantly expired. I regret that the approaching night, and the man's desire to bury the carcass, restricted the post-mortem examination, which merely went to show that upon the division of the costal cartilages the lungs protruded, as if too large for the cavity of the thorax, and being cut into, poured forth a frothy mucous, resembling in colour and consistence soap-lather; the stomach and duodenum were filled with the matters above described to have been eaten, not however impacted, probably owing to the premature death. I have little doubt from the symptoms that, had the examination gone so far, the vessels of the brain and spinal cord would have been found injected. The splash of water certainly caused disquietude; but, inasmuch as noise of any sort produced similar effects, it is doubtful whether aversion to fluids existed; and yet the circumstance of death instantly following the oil-draught would warrant the belief that spasms of the muscles of deglutition, with the temporary closure of the glottis, occasioned suffocation and death."

Among all the numerous cases of rabies which we have met with in the course of our practice, we have never had the opportunity of examining the post-mortem appearance of a rabid pig; but it seems to be generally admitted by those who have done so that there is invariably inflammation about the glottis, and very considerable inflammation of the villous coat of the stomach, especially about the pylorus, towards the cardia, and on the surface of the two rugæ; in some parts the inflammation had almost merged into mortification. The stomach is generally filled with every kind of filth and rubbish, and the bladder distended with urine.

The disease generally appears in the third or fourth week after the animal has been inoculated, but it has been known to lie dormant for two months.

Incision of the part and the application of the cautery as soon as possible after the animal has been bitten are the only preventive means: cure there is none when once this disease has made its appearance, and those who rely on the infallible nostrums of some learned "pig-doctor" will find themselves disappointed; the symptoms may be alleviated by certain drugs, but rabies is incurable.

We are not aware that rabies has ever been known to be communicated by the bite of a pig, but Julian Palmarius states that he has seen horses, cattle, and sheep become rabid from eating the straw in which rabid pigs had lain; and Dr. Shackmann corroborates the fact.

It has been a much disputed point whether or not the flesh of animals which have died rabid can be eaten with safety. Two eminent scientific men in Paris ate of such flesh without experiencing any bad effects. The carcass of an ox that had been bitten by a rabid dog, and had exhibited all the symptoms of rabies, was cut up and sold, but it did not appear that any of those who ate of it experienced the slightest inconvenience. Again, at the Royal Veterinary School at Alford, the tongue of a rabid horse was given to a dog; the animal devoured it, and lived on in perfect health.

But the opposite party bring forward as many authenticated facts in support of the contrary opinion, and the one with which we now have chiefly to do is narrated by Schenkius: "A tavern-keeper in the duchy of Wurtemberg served up the flesh of a pig that had died rabid to some customers who were dining at his inn. All those who partook of it were shortly afterwards attacked with rabies." Pierre Borel records a very similar case.

We should most strongly urge the prudence of abstaining from the flesh of all rabid animals, and not only of abstaining from it ourselves, but putting it out of the reach of other animals; and the best way to do this is to bury the carcass six or eight feet under ground, and cover it carefully and closely up.

Nasal Catarrh.—We have already spoken of the formation of the nose or snout of the pig, and will now proceed to describe a disease vulgarly called the *snuffles*, or *sniffles*. It is characterized by defluxion from the nose in the first place, and its advance is so gradual as to be almost imperceptible. But it gains ground daily—attacks the respiratory passages—cough and sneezing come on—there is evident difficulty of swallowing, and the respiration is impeded by the mucus formed. After some time the membrane of the nose becomes thickened, the nostril swelled and deformed, and the snout drawn on one side. Blood is often discharged from the nostril, and when this has been the case all the symptoms are abated, and the animal seems relieved for awhile. But it too frequently happens that this discharge or hemorrhage returns again and again, each time in increasing quantities, until the strength of the animal becomes so undermined that, notwithstanding the utmost care and the most nourishing diet, he dies of exhaustion, or perhaps, as it may be more properly termed, consumption.

This disease, which strongly resembles glanders and distemper, is, like them, hereditary, and may be communicated from either the male or female parent. It also results from exposure to damp or cold.

Emetics and tonics are the best means of combating it. A solution of sulphate of copper in doses of from three to five grains morning and night will sometimes eventually effect a cure, assisted by strict attention to diet and regimen. But in by far the majority of cases the disease runs its course and terminates fatally, for it has generally gained the upper hand before much notice is taken of it.

The Larynx.—This instrument of voice consists of five cartilages united to one another by a ligamentous substance, by distinct articulations, and by a seemingly complicated but really simple muscular apparatus. In form it is an irregular oblong tube, exceedingly flexible, and capable of adapting itself to all the natural or morbid changes of the respiratory process, and to the production of all the various intonations of sound or voice by which the animal expresses his emotions. It is placed at the top of the windpipe, guards the exit from the lungs, and prevents the passage of food into the respiratory canals.

The *cricoid cartilage* constitutes the base and support of this organ, and serves in great measure as a bond of union to the rest.

Placed above and resting upon this are the *arytenoid cartilages*, prolongations of which rest upon the *chordæ vocales*, and influence their action. The vocal ligaments take an oblique direction across the larynx in the pig instead of a straight one, so that the angle is at a considerable distance from the thyroid cartilage. They have also a curious slanting direction, the anterior angle being depressed and the arytenoid portion elevated. About the middle of the chordæ vocales, and immediately above them, are two sacculi, which are generally supposed to be concerned in the act of grunting. From the anterior parts of the larynx springs the *epiglottis*, a heart-shaped cartilage placed at the extremity of the opening into the windpipe, with its back opposed to the pharynx; its use is this: food passing from the pharynx on its way to the œsophagus presses down the epiglottis, which, closing the aperture of the larynx, prevents any portion of the food from entering it. As soon as the food has passed, the elasticity of the epiglottis, assisted by that of the membrane at its base, and still more by the power of the *hyo-epiglottideus* muscle, enables that cartilage to rise up and resume its natural position.

The *thyroid cartilage* envelops and protects all the rest, and shields the lining membrane of the larynx, which vibrates under the impulse communicated by the passage of the air, and gives the tone or voice.

In the larynx of the hog we find that beautiful adaptation of means to the end. The space between the arytenoid cartilages is less, comparatively speaking, than in the horse or dog, speed not being required in swine. The epiglottis, too, is larger than in the ox, sheep, or horse, and differently constructed; it is more flexible, from the cellular ligamentous substance at the base of it being looser: and from its increased size, and the curved direction of its edges, it not only covers the opening into the windpipe, but in a manner embraces the arytenoid cartilages when pressed down by the passage of food, a formation admirably suited to an animal which is constantly plunging his nose and muzzle into the mud or dirt, and which, by blowing into his food in the peculiar way pigs are apt to do in order to stir up the sediment, would otherwise be constantly getting some irritating and noxious matters into his

windpipe. The inferior cornu of the thyroid bone is comparatively more developed in the hog than in other domesticated animals.

The Pharynx.—The pharynx, to which we just now alluded, is a membranous, muscular, funnel-shaped bag, extending from the root of the tongue to the larynx and œsophagus, wide in front and becoming gradually narrower until it terminates in the œsophagus. Its office is to convey the food from the mouth to the upper part of the gullet, and this it performs by means of its lining muscles. Properly speaking, we ought perhaps to have noticed it when speaking of the digestive system, but as we are proceeding from the head to the neck we have included it in this division of our subject.

The Os Hyoides.—This is a body which embraces the thyroid cartilage of the larynx, and gives support and protection to it, and also affords attachments to the *hyo-glossus longus* muscle, or that which draws the tongue into the mouth; the *brevis*, which fulfils a similar office; the *hyo-pharyngeus*, which dilates the pharynx; the *anterior constrictor pharyngeus*, which contracts the pharynx, and several others.

This bone in the human being is supposed to resemble the Greek letter Upsilon; in the horse it may be compared to a spur, but in the swine it is different. This animal requires a freer use of the tongue. The shorter cornua are stronger than in the horse, or even the ox and dog; the central one is less developed, and the longer cornua is thin and insignificant. There is also considerably less ligament interposed between this bone and the thyroid cartilage, which it almost closely embraces. We will now proceed to a consideration of the diseases of the throat and neck.

Strangles or Quinsy.—These diseases are of very frequent occurrence, and as they are rapid in their progress, generally exceedingly fatal. They chiefly attack fattening hogs.

The glands under the throat begin to swell, and thus affect not only the respiratory organs but the act of swallowing; impeded respiration, hoarseness, and debility then supervene: the pulse becomes quick and unequal, the head to a certain extent palsied, the neck swells, tumefies, and rapidly goes on to gangrene; the tongue hangs from the mouth, and is covered with slaver, and the animal gradually sinks. In the commencement of the disease very simple treatment, as cooling medicines, attention to diet, and care and warmth, will often suffice to check it; but when the swelling, impeded respiration, and difficulty of swallowing have come on, recourse must be had to more energetic treatment. Bleeding and purgatives are first indicated; setons and puncture of the swollen glands have also been recommended, and in extreme cases there is no reason why we should not have recourse to blisters and external stimulants as counter-irritants.

A diseased animal should never be allowed to remain among healthy ones, as this malady is so infectious that it may almost be regarded as an epizoötic.

Mr. Cartwright, veterinary surgeon, of Whitchurch, who has paid much attention to the diseases of swine, gives the following account of some fatal cases of inflammation of the glands of the throat in the *Veterinarian*:— He says that he had six pigs [illegible] nearly the same period. Their respiration was very quick; they [illegible] and foamed at the mouth. They could not bear to be pressed on the throat, and swallowed liquids with difficulty. To some of them jalap was given, and to others castor and goose oil. One was blistered under the throat, and all bled by cutting off their tails. They died in the course of eight-and-forty hours from the commencement of the disease.

On examination he found much inflammation under the jaws and throat, and also much of swelling with effused serum. In some of their windpipes, and the branches of the bronchia, there was a great quantity of mucus, but no apparent inflammation. In one the heart appeared to be inflamed, but most probably sympathetically.

Columella thus speaks of these diseases: "Such swine as have swellings of the glands under the throat must be let blood under the tongue; and when it has flowed abundantly, it will be proper that their whole mouth be rubbed over with bruised salt and wheatmeal. Some think it a more present and effectual remedy when they pour into each of them, through a horn, three cupfuls of *garum*, or salt-fish pickle; then they bind cloven tallies, or cuttings of fennel-giant with a flaxen cord, and hang them about the necks, so that the swellings shall be touched with the fennel-giant cuttings."

If we may judge by the writings of the ancients, the most prevalent diseases among pigs were those of the glands of the throat. Didymus gives a long and accurate description of them.

Hurtrel D'Arboval also gives an account of a disease of the glands of the throat, which he denominates *poil piqué*, *maladie piquante*, or *soie*, and states it to be peculiar to swine. He thus describes it:—

It is situated on one or both sides of the neck, between the jugular vein and the tracheal artery. On the part affected is seen a raised tuft of hairs, differing from any of the others, being hard, rough, dull, and discoloured, and exceedingly painful to the touch; and if one be pulled out the skin comes away with it. At first there is only slight depression or concavity of the part; but the skin soon becomes red, then violet-coloured, the hairs conglomerate, the parts become softened, tumefied, and even proceed to mortification. Meanwhile the animal betrays symptoms of thirst, there is dulness, loss of appetite and grinding of the teeth. As the malady progresses, the patient becomes inert, deaf, insensible to blows, lies down constantly, and totters and

falls if compelled to rise; the flanks heave, the mouth is hot and full of slaver, the tongue red and inflamed, the lower jaw convulsed, and the conjunctiva injected; the animal utters plaintive moans, and, if not speedily relieved, dies of suffocation, from the effects of the pressure of the tumor upon the air passages.

D'Arboval attributes this disease to the irritation caused in some of the cutical tissues by the abnormal growth of the tuft of hair, which, uniting with some internal sympathetic irritation induced by heating food, damp litter, hot, ill-ventilated styes, or such like prejudicial influences, acts locally and determines this disease of the glands. Other French writers believe it to be epizoötic and to arise from certain miasmatic influences.

Tonics, acidulated drinks, warmth, cleanliness, strict attention to diet, and the application of actual cautery to the root of the evil—the tuft of hair—is the treatment prescribed.

The Chest or Thorax.—In the human being this constitutes the superior, and in quadrupeds the anterior portion of the body; it is separated from the abdomen by the *diaphragm*. This latter is of a musculo-membranous nature, and is the main agent in respiration; in its quiescent state it presents its convex surface towards the thorax, and its concavity towards the abdomen. The anterior convexity abuts upon the lungs, the posterior concavity is occupied by a portion of the abdominal viscera. The diaphragm of the pig resembles that of the ox and sheep.

The chest is divided into two cavities by a membrane termed the *mediastinum*, which evidently consists of a duplicate of the *pleura* or lining membrane of the thorax. The pleura is a serous membrane possessed of little or no sensibility, and acted upon by but few nerves. It is smooth and polished; covers the bony wall of the thorax from the spine to the sternum, and from the first rib to the diaphragm, and dilating and forming a kind of bag which spreads over and contains the whole of the lung.

The lungs form two distinct bodies, the right being somewhat larger than the left one; they are separated from each other by that folding over of the pleura termed the mediastinum, and hence may be said to be inclosed in separate bags, or to have distinct pleuras. Each lung is subdivided. The right one consists of three unequal lobes, the smallest of which is again subdivided into numerous lobules, differing in number in different swine. The left lung consists of two lobes, and the scissure between these is not very deep.

Beneath the left lung the heart is situated and partially enclosed in another membranous bag, termed the *pericardium*, which closely invests, supports, and protects it. The heart has two sides, the one devoted to the circulation of the blood through the lungs, and the other to its circulation

through the frame generally. Each side is divided into two compartments, the one above the other below, which are termed the *auricles* and *ventricles*. The right auricle as well as the ventricle is larger than the left, and its parietes are thinner. The longitudinal tendinous cords of the ventricle are more firm and distinct in the pig than in the ox or sheep, and the fleshy prominences shorter. The tendinous cords of the left ventricle are few in number, large, and ill-defined. The aorta of the pig separates almost immediately after its commencement into two trunks, the smaller of which leads forward, and gives forth those arteries which in other animals arise from the cross of this artery; and the other, which is longer in diameter, inclines backwards: these are usually termed the anterior and posterior aorta.

The beating of the heart may be felt on the left side, whence also the pulse may be taken, or from the femoral artery which crosses the inside of the thigh in an oblique direction. In swine in a state of health the pulsations are from seventy to eighty in a minute.

Diseased Valves of the Heart.—This appears to be a more common malady than is generally suspected, for in repeated cases of sudden death, where a post-mortem examination has been made, there have been found fleshy excrescences or tumors on the tricuspid valves. We believe Mr. Cartwright, whose name we have already mentioned, was one of the first persons who drew attention to this disease. The only marked precursory symptoms appear to be inappetency and very shortly before death difficulty of breathing and evident distress. In one pig that died thus suddenly, Mr. Cartwright found several uneven watery excrescences, some as large as marbles, growing from the edge of the auricula-ventricular valves of the left side; also several small papillary growths, all of which served three parts to close up the ventricular opening.

In another case he found a loose, jagged, watery excrescence growing from the whole surface of the tricuspid valves, closing up in a great measure the ventricular opening, and projecting at least half an inch into the left auricle. In a third the valves of the left auricle were thickened, scirrhous, and presented a ragged uneven surface. The orifice of the ventricle was almost closed up by this diseased substance, and a portion had forced its way into the aorta. This disease was always found in the left side of the heart, and in no case did it extend beyond the circumference of the valves; the lining membrane of the heart always remained intact.

Bronchial Tubes.—Swine are very susceptible to *bronchitis*, and also liable to worms in the *bronchia*, both of which affections manifest themselves under the form of cough, inappetency, and loss of flesh. The former may be subdued by bleeding and cooling medicines, as sulphur, cream of tartar, or pulv. antimonialis: the latter almost invariably cause the death of the

animal from the irritation they create and the inflammation which is thus set up.

Inflammation of the Lungs.—This disease is perhaps more generally known under the term of *rising of the lights;* it is one of the most prevalent and too often the most fatal of all the maladies that infest the stye. It has been supposed by some persons to be contagious, by others to be hereditary, but there does not appear to be any actual foundation for either of these opinions. By far the most probable supposition is that it arises from some atmospheric influences or agencies which create a tendency to pulmonary affections, and these, acting upon a system heated and predisposed to disease by the mode of feeding adopted in most piggeries, give a serious and inflammatory character to that which would otherwise be merely a simple attack of catarrh; or it may arise from some irritating influence in the food itself, or from damp, ill-ventilated styes: whatever be its cause, it generally runs through the whole piggery when it does make its appearance. The prominent indications of disease are loss of appetite, incessant and distressing cough, and heaving at the flanks.

As soon as the first symptoms are perceived, the animal should be bled; the palate perhaps will be the best place in this case to take blood from: purgatives must then be given, but cautiously; Epsom salts and sulphur will be the best, administered in a dose of from two to four drams of each, according to the size of the animal. To these may succeed sedative medicines: digitalis, two grains; pulv. antimonialis, six grains; nitre, half a dram; forms a very efficient and soothing medicament for moderate-sized pigs, and will often produce very satisfactory effects; cleanliness, warmth, and wholesome, cooling. nutritious food, are likewise valuable aids in combating this disease. But whatever measures are taken, they must be prompt; for inflammation of the lungs runs its course with rapidity and intensity, and while we pause to consider what is best to be done saps the vital energies of the patient.

Pleuro-Pneumonia.—This disease often breaks out among pigs as well as horses, cattle, and sheep, and commits great devastation. We shall quote some accounts of its progress, treatment, and post-mortem appearances given by English and foreign veterinarians, by whom it is classed under the head of

Epidemics.—M. Saussol narrates that during the summer of 1821 nearly all the swine in the neighbourhood of Mazemet were attacked by a violent and mortal disease that spared neither age nor sex, fat nor lean. He rates its ravages at about one-fifth of every four hundred patients.

The first symptoms were inappetency, thirst, dulness, groaning, and seeking of moist places; then followed hardness of the belly, heat of the skin,

constipation, diminution of the urine, difficulty of respiration, heaving of the flanks, and short cough; the eyes were full of tears, and the mucous membranes inflamed. All these symptoms came on in the course of twelve hours. If the disease continued, the succeeding symptoms were still more alarming; the animals began to stagger about, the limbs were stretched out in an unnatural position, rattling in the throat came on, they supported themselves against the wall, and only fell to die a few minutes afterwards. Death usually came about the third day, and was in some cases preceded by convulsions of the face and extremities.

Treatment.—Copious bleedings from the *sacro-coccygean* arteries and veins, or, if these did not yield blood enough, amputation of the tail, hot baths, a seton covered with blistering ointment inserted in the chest, camphorated and laxative drenches, and a decoction of borage, mallows, and lettuces, slightly acidulated, to drink.

Causes.—Exposure to the heat of the sun, want of water, feeding on dry plants; returning home in the evening exhausted, receiving a hearty feed, and being then shut up in ill-ventilated styes without drink until morning.

Preventive treatment.—Troughs of acidulated nitrated water placed in the styes and frequently renewed; non-exposure to the heat of the day, means of bathing, bleeding, cleanliness, and ventilation; moderate feeding, and gentle exercise after the sun had set. These precautionary measures, M. Saussol says, arrested the progress of the disease.

Post-mortem appearances.—The thoracic cavity was filled with bloody limpid fluid; the lungs much inflamed; the pleura thickened, inflamed, and injected; the diaphragm covered with black patches of the size of a shilling; the mucous coat of the intestines slightly inflamed; the windpipe and bronchial tubes full of reddish froth; the brain covered with reddish serosity.

The next account we come to gives a description of a somewhat different epidemic which occurred in Aveyron and its environs, attacking both the respiratory and digestive organs, and running its course with astonishing vigour and rapidity, frequently sweeping off all the inhabitants of a piggery in from twelve to fourteen hours, and in the more virulent cases in less than half this time.

Symptoms.—In the worst cases these are sudden loss of appetite, small and frequent pulse, haggard eyes, the conjunctiva inflamed, the mouth open, red, and filled with foam, the respiration laborious, plaintive cries, convulsions, palsy of the hind limbs, and involuntary discharge of highly fetid fæces. Death here is the inevitable termination, and that in a short time. But where the progress of the disease is less rapid, the symptoms assume a milder form, and medical aid is available and often beneficial. Pregnant sows escape the attack of this malady, but as soon as they have farrowed they lose this immunity and they and their young take it. It also seems to spare leprous

swine. It appears at all seasons of the year, but is most malignant in the summer and at the commencement of autumn. There can be no doubt as to its contagion, and from some experiments made, it can be reproduced in other animals by inoculation, particularly in sheep. The flesh of pigs that have died of this disease has been given to dogs and eaten by them without producing any bad effects.

Causes.—Unwholesome food, ill-ventilated styes, want of attention to cleanliness, exposure to heat, wet, or cold, are the predisposing causes; and probably some miasmatic influence develops the disease.

Treatment.—In the most virulent cases almost all modes of treatment are unsuccessful; or, if they do succeed in rescuing the animal from death, he generally falls into a state of marasmus, or becomes paralytic. In the milder cases the following means have often proved efficient:—Seton in the chest; a decoction of sorrel, with camphor, nitre, and calomel, as a drench; emollient injections, slightly acidulated; stimulating frictions of the dorsal and lumbar regions, or bathing these parts with hot vinegar; and water thickened with oat or barleymeal as the sole diet and drink. Venesection is here dangerous, tending only to undermine the strength of the patient, this disease being evidently one which alters, decomposes, and vitiates the blood. Acetate of ammonia, administered in doses proportionate to the size of the patient, has been of service. Purgatives should be avoided, as they are of very uncertain benefit. Directly an animal is attacked he should be removed from the others, and placed in some comfortable place.

Prevention.—Strict attention to diet, cleanliness, ventilation, and comfort; and a plentiful supply of clean water, both for the animals to drink and bathe themselves in. In cold and rainy weather they should be kept in their styes; and during the heat of the summer their drink should be slightly nitrated, acidulated, or salted. Whey is an excellent thing for those that are weakly. Small doses of camphor and nitre, with the addition of a few grains of calomel, administered in some cooling vegetable decoction, is a useful preventive. If one pig is attacked he should be removed, and the others taken out while the sty is well fumigated.

In 1838 we have accounts of an inflammatory epizoötic among pigs, rapid and fatal in its course, and attacking by preference store pigs rather than those put up to fatten.

Symptoms.—Prostration of strength, difficulty of breathing, discharge from the mouth and nostrils, constant cough, and reddish hue of the skin. These went on increasing in intensity until death put a period to them, which usually occurred in from three days to three days and a half after the commencement of the attack.

Treatment.—Bleeding and laxative medicines, stimulating frictions of the trachea and parietes of the thorax, seemed to be the most efficient remedies.

Doses of tartarized antimony and hydrarg. sub. mur. in three grains of each, administered every twelfth hour, produced vomiting, and appeared to give ease. Sulphate of magnesia relieved those cases in which there was constipation.

The causes seemed obscure. The epidemic prevailed in the summer; but whether it arose from the warmth of the weather, from want of a sufficient supply of water, or from dry and heating food, was not at all evident.

Paulet has described a very similar epidemic among swine, which frequently prevails in one or the other of the *arrondissements* of the South of France. He describes it as highly inflammatory, rapidly going on to gangrene, and exceedingly contagious, but is at a loss to what cause to attribute it.

The precursory symptoms are, according to him, restlessness, cough, loss of appetite, dulness, and weak tottering gait. These gradually go on increasing in intensity until the seventh or eighth day, when they have become very marked. Then alternations of heat and coldness of the body come on; the ears droop and are cold, the head is heavy, and the tongue becomes discoloured; the breath is fetid, and there is a copious discharge of mucus from the nostrils. The skin is tinged with red, but the hue is not very evident excepting under the belly: the animal appears to be in great suffering, and cries out pitifully. This general inflammation of the integuments rapidly goes on to gangrene, which alteration is evidenced by the livid violet hue of the diseased surfaces. Death then rapidly follows.

He, too, prescribes bleeding, and from the ears and veins of the belly, while many authors condemn it as debilitating. The only thing he recommends besides is thin oatmeal gruel, acidulated with white-wine vinegar; for he appears to consider the malady to be so fatal that medical treatment avails nothing against it. Here, however, we cannot but deem him wrong; many of the most virulent, and, if neglected, fatal of the diseases to which our domesticated animals are subject will yield to the influence of a judicious course of treatment, and many a valuable animal has been saved by the skill and attention of a veterinary surgeon. We should recommend laxative drenches, stimulating frictions, warmth, and cleanliness, and a seton in the chest.

In the epidemic which prevailed in 1841 throughout the greater part of England, swine were affected, as well as horses, cattle, and sheep, and often took it before any of the rest of the stock but in general had it more mildly. This malady was of a highly contagious, inflammatory character, and affected chiefly the mucous and secretory tissues. When once it entered a farmyard, it spread rapidly until every ox, sheep, or pig was infected, and in some instances it passed to the human being. Damp, wet weather appeared most favourable to its development; and from all accounts, it seems to have arisen from some atmospheric agency.

Symptoms.—Lameness of one or more of the feet, accompanied with heat around the hoof and lower part of the leg; discharge of saliva from the

mouth and nostrils; champing or grinding of the lower jaw; ulceration of the mouth and tongue, extending even to the anus; dulness, inappetency, constipation, rapid emaciation, and cough.

Treatment.—The ulcerated portions of the feet and the detached pieces of horn should be carefully pared, and the parts daily washed with a solution of blue vitriol, or smeared with warm tar; also dressed with a strong solution of alum; and from an ounce and a half to two ounces of Glauber's salts, dissolved in water, and given in their food. Where the malady was attacked in its onset, these simple remedies sufficed to produce convalescence in from fourteen to one-and-twenty days.

Post-mortem appearances.—There were patches of inflammation throughout the whole of the intestines, both externally and internally; the liver was sound; the heart flabby and soft; the lungs shrivelled, flattened, and diminished to one half their natural size, and in some cases hepatized; the diaphragm, pleura, and bronchial tubes of a greenish hue, and evidently gangrenous.

The flesh of pigs that had died of this epidemic was eaten by some persons without their suffering any ill effects; nevertheless the experiment was hazardous.

The Gullet.—The gullet, or *œsophagus*, is a musculo-membranous tube, commencing at the pharynx, passing down the throat on the left side of the windpipe, entering the chest in company with that tube, penetrating through the folds of the diaphragm, and terminating in the stomach through an orifice termed the *cardia*.

The Stomach.—The stomach of the hog is a much more simple apparatus that of the ox and sheep; it is a truly omnivorous one, and beautifully adapted by its pyramidal appendage and glandular structure, as well as by the villous mucous membrane with which it is lined, for the digestion of the heterogeneous food which it is destined to receive, being, perhaps, more analogous to that of the horse than to any other animal. In form it is globulous. Its large blind cavity is very voluminous, and is surmounted in front by a hood-like appendage. The narrow long portion which abuts on the pylorus greatly resembles this hood-shaped appendage. On each side of the cardia are two transversal folds, and the cardia itself is half-way between the pylorus and the large cavity.

The stomach has three coats—the outermost, or *peritoneal*, which constitutes the common covering of all the intestines; the muscular or fibrous coat, which acts upon, and mingles the food, and prepares it for digestion; and the mucous or villous coat, which is peculiarly developed in the pig, and into which open the mouths of numerous little vessels, conveying the gastric juice to the semi-digested food, and by its action conveying it into a pultaceous fluid, commonly called *chyme*.

The Intestines.—The intestines of the hog bear a stronger resemblance to those of the human being than we find in any other animal. They are sixteen times the length of the body of the animal, and the proportions of the small intestines to the large are as three to one. They are composed of four coats or layers. The outer or peritoneal one is formed of that membrane which invests and retains in its proper position every portion of the contents of the belly. The second layer is muscular, and by its action propels the contents of the stomach gradually onward. The office of the third is to lubricate the innermost coat, and for this purpose, it is supplied with numerous glands surrounded by cellular tissue. The fourth or lining coat is soft, villous, and, in a healthy state, always covered with mucus. The food, having been sufficiently converted into chyme by the action of the stomach, is gradually propelled through the pyloric orifice by the duodenum, or first intestine, where it is submitted to the influence of two fluids, the one secreted by the pancreas, the other by the liver, and the combined action of which separates the nutritious from the worthless portion, causing the former to assume the appearance of a thick whitish fluid, and the latter that of a yellow pulpy substance. It next passes into the jejunum and ileum, where it undergoes still further alteration, and whence a considerable portion of it is taken up by the lacteal vessels which open into these two small intestines, and conveyed away to nourish the frame, and become mingled with the blood and supply the waste in it. These intestines are of equal diameter in the pig throughout their whole extent, and the termination of the jejunum and commencement of the ileum is by no means distinctly defined; the latter is, however, longer than the former, and opens into the cœcum, with a valvular opening close to the aperture into the colon. The cœcum is a kind of bag supplied with numerous secretory glands, which furnish it with a fluid which once more acts upon those portions of the digested food which reach it, extracting from them any nutritive portions which may chance still to remain. The matter, having reached the base of this intestine, is returned by the muscular action of its coat, and being prevented by the valve from reëntering the ileum, passes into the colon, the largest of the large intestines, some of the convolutions of which equal the stomach in size, while others are as small as the small intestines. Here the watery parts of the mass are extracted, and the residuum or hard fæcal portion is retained for awhile, and finally expelled through the *rectum*. It will be readily imagined that this complicated and beautiful process must occasionally become deranged by various causes, and that hence will arise different diseases of a more or less serious nature. This is, however, less the case in swine than in most of our other domesticated animals, from the circumstances of their stomachs and intestines being prepared by the softening power of their highly mucous villous lining for the reception and digestion of a heterogeneous mass of food, which to other animals would be actually poisonous; rendering it

evident that, although the hog in a state of nature is a herbivorous animal, he was also destined to become omnivorous for the service of man.

Enteritis.—This disease consists in inflammation of one or more of the coats of the intestines, and is capable of being produced by various irritating causes, as the foul air of badly ventilated styes, unwholesome food, etc.

The symptoms are dulness, loss of appetite, constipation, spasms, or convulsions, continued restless motion, either to and fro, or round and round, staggering gait, evident symptoms of suffering.

The most successful treatment is warm baths, dry litter, and general warmth and comfort; and internally, purgatives and enemas. Castor oil, calomel, or rhubarb are the best purgatives for cases of this nature, and the enemas should be of an emollient oleaginous nature. The diet should be restricted to the simplest and lightest food; oatmeal porridge, skim-milk, or whey are the best things.

Colic.—The hog is frequently attacked by this malady, which generally arises from unwholesome food, cold, or wet, filthy styes; and is evidenced by restlessness, cries of pain, rolling on the ground, etc. A dose of castor oil proportionate to the size of the patient, with perhaps a little ginger in it, and administered in warm milk, will generally give speedy relief; or if the first should not, the dose must be repeated. Some practitioners recommend Glauber's or Epsom salts, but we consider oleaginous purgatives to be best adapted for attacks of colic.

Diarrhœa.—This is a disease very common among all our young domesticated animals, and one that is also repeatedly met with in older ones; a scanty allowance or unwholesome food will produce it, as will also over feeding, or too nutritious diet. It consists in a frequent discharge of the fæcal matter in a thin or slimy state, but not actually altered, and arises from inflammation or congestion of the mucous lining of the intestines. What we conceive to be an attack of diarrhœa is often only an effort of nature to throw off some offensive matters, and will cease of itself in the course of twenty-four hours, but where it goes on for any length of time it must be taken seriously in hand, as it will otherwise weaken the animal and impair its value. The best remedy for it is the compound commonly called calves' cordial, viz.: prepared chalk, one ounce; powdered catechu, half an ounce; powdered ginger, two drams; powdered opium, half a dram, mixed and dissolved in half a pint of peppermint water. From half an ounce to an ounce of this mixture, according to the size of the animal, should be given twice in the day; and strict attention paid to the diet, which should consist as much as possible of dry, farinaceous food.

Garget of the Maw.—This is a disorder arising from repletion, and is found alike in older animals and in sucking-pigs. Its symptoms strongly resemble those of colic. The remedies, too, are purgatives. Epsom salts is here, perhaps, as good a thing as can be given, in doses of from a quarter of an ounce to an ounce. It might as well be termed *indigestion*, for such it actually is, the stomach being overloaded with food. In sucking-pigs it usually arises from the coagulation of milk in the stomach.

The Liver.—This organ in swine does not appear to be so subject to disease as it is in most of our other domesticated animals; we have only, therefore, to glance at its use and anatomy as we pass. It is smaller in swine than in sheep, and larger than we find it in the dog, in accordance with that anatomical law, which seems to be in force in all animals, namely, that the size of the liver shall be in inverse proportion to that of the lungs. It is situated in the anterior part of the abdomen, and its upper surface rests against the concavity of the diaphragm. Its office is to receive the blood that is returned from the intestines, separate from it and secrete the fluid termed *bile*, and then forward the residue of the blood onwards to the lungs, where it undergoes the usual aërating process, and becomes transmuted into arterial blood.

The fluid or *bile* thus secreted, when in a healthy state and not in undue proportion, stimulates the mucous membrane, and increases the peristaltic motion of the intestines, excites the secretion of that mucus requisite to preserve these parts in a healthy state, hastens the process of separating the nutritious from the innutritious parts of the food, and facilitates the escape of fæcal matters. It also acts chemically upon the various substances which are devoured by the animal, and is the chief agent in neutralizing the acidity which some of these would otherwise create. The liver of the pig has four distinct lobes.

The Spleen.—In the hog the spleen is very long, and nearly of a uniform breadth and thickness throughout its whole extent. It lies on the left side of the abdomen, and is attached to the stomach by the folds of the epiploön. Its texture is almost like that of a sponge in appearance, consisting of innumerable cells of every size and form, yet it is firm to the touch. In colour it is a dark, deep reddish brown.

There has been much dispute as to the functions and use of this organ. Some persons, arguing from its situation, contend that it is a powerful agent in the process of digestion; but this is strongly negatived by the fact that it has been removed from some animals which have existed for a considerable time afterwards, without apparent injury to that function. Others again, and with more probability, assume that it has to do with the colouring and

conversion of the chyle into blood as it passes through the mesentery, where it becomes mixed with the red coagulable fluid furnished by the spleen. But with these physiological questions we have at present nothing to do: our purpose is simply to consider it with a view to understanding and treating those diseases of which it is not unfrequently the seat. Little attention has hitherto been paid to them, probably from their symptoms being somewhat obscure; but, nevertheless, different morbid affections of the spleen are by no means uncommon among the lower domesticated animals. This viscus is often ruptured, distended with blood, inflamed, or softened, from the effects of different causes, but chiefly of damp, heat, or foul air.

Splenitis.—Swine suffering under this malady are restless and debilitated, shun their companions, and bury themselves in the litter. There is loss of appetite and excessive thirst, so excessive that they will drink up anything that comes in their way, no matter how filthy. The respiration is short; they cough, vomit, grind the teeth, and foam at the mouth; the groin is wrinkled, and of a pale brownish hue, and the skin of the throat, chest, and belly (which latter is hard and tucked up) is tinged with black.

The remedies are copious blood-letting, gentle purgatives, as Epsom or Glauber's salts, followed up by cooling medicines. Cold lotions of vinegar and water, to bathe the parts in the neighbourhood of the spleen, or a cold shower-bath applied by means of a watering-pot, are also efficacious in these cases.

Columella, in his quiet style, thus treats of this disease:

"Also the pain of a distempered spleen uses to plague them; the which chiefly happens when there chances to be great droughts, and, as the Bucolic poem speaks—

> When on all sides the apples scattered lie,
> Each under its own tree;

for it is an insatiable cattle the swine, which beyond all measure eagerly seek after that which is sweet. They labour and are affected in the summer and early autumn with a swelling or growth of the spleen, from the which they are relieved if troughs be made of *tamarisk* and *butcher's broom*, and filled with water, and set before them when they are thirsty; for the medicinal juice of the wood being swallowed with the drink puts a stop to their intestinal swelling."

The great difficulty here is, how troughs can be made of the *muscus* (butcher's broom). In all probability the true meaning is that the trough should be lined with the branches of this plant; and the *tamarisks* signifies doubtless the *tamaricus è trunco* mentioned by Pliny, lib. xxiv. 9, where he speaks of canals and troughs being made of the *tamarix*. Translators are given occasionally to make similar mistakes or alteration of text.

Rupture of the Spleen.—We quote this case from the *Veterinarian* for 1841:

"A pig belonging to Mr. Roberts, of Whitchurch, died after having only been ill for a day or so, and that unattended by any definite symptoms. On post-mortem examination the spleen was found to be of about three or four times its natural size, and completely congested. In one place there was a small rupture surrounded with coagulated blood. All the other viscera were perfectly sound."

Absorption of the Spleen.—This case is also derived from the same source, and we present it to our readers as a testimony of the different forms of disease which occur in the spleen of the swine.

"A fat pig, weighing fifteen score, was killed, and upon cutting it up, the spleen was found to be almost entirely absorbed. It was of the usual length, but not above half an inch in width or the eighth of an inch in thickness in any part, and weighed but seven drachms. What there was of it, however, appeared to be perfectly sound, and was surrounded by a considerable portion of adepa."

Peritoneum.—This portion of the contents of the abdomen is composed of cellular tissue, and amply supplied with absorbent vessels; its office is to separate the different viscera from each other, to envelop them, and to attach them to, and support them in their proper position. It is subject to attacks of inflammation, technically termed

Peritonitis, the symptoms of which closely resemble those of splenitis; and the causes, too, are very similar, being chiefly improper food, repletion, or exposure to extremes of temperature. Oleaginous purgatives are here the only ones which are admissible, and emollient clysters; great attention must also be paid to the diet, and nothing of an acrid or indigestible nature given to the animal. This disease is too often fatal, gradually wasting away its victim. The post-mortem appearances are as follows: the intestines have become so adherent to each other that it is scarcely possible to believe that any false membranes were ever interposed; the peritoneal surfaces present evidences of inflammation, and are often covered with confluent ulcerations resembling those seen in glanders of the horse; there is considerable inflammation of the muscular coat of the intestines, and the whole of these parts are thickened and corrugated.

Worms in the Intestines.—These entozoaria are very troublesome in swine, and often exceedingly fatal. The *spiroptera strongylina* is of the kinds most common to the hog, but the *ascarides tænia* and *echinorhinc* are likewise often found in considerable numbers.

The presence of worms may be inferred when the animal eats voraciously and yet continues lean and out of condition; coughs, runs restlessly about, uttering squeaks of pain, becomes savage, snapping at his companions, and destroying all rabbits and poultry that come in his way. The excrements are generally hard and highly coloured, the eyes sunken, the animal becomes daily more debilitated, and frequent attacks resembling colic tend still further to weaken him. Too often he dies; for before these symptoms have been noticed the evil has generally attained to such a height as to be beyond the power of medicine; for these parasites, and the *echinorhinc* especially, multiply with incredible rapidity.

Drastic purgatives constitute the most efficient means of combating worms; but they must be cautiously administered, as they are but too apt to dissolve and force away with them the lining mucus of the intestinal canals. Turpentine is exceedingly destructive to worms, and although to many of our domesticated animals a dangerous medicine, it may be administered with perfect safety to the hog. Common salt may be also given with advantage, and should be mingled with the food. Nor must it be supposed that because no worms are seen to come away from the animal the treatment may be discontinued, or that there are none; hundreds of them die in the intestines, and there become digested and decomposed, and go through the same processes as the food.

The Bladder.—This organ seems to be but little subject to disease in swine. Its position beneath the rectum and genital organs contained in the pelvic cavity protects it in all animals from external injuries; and the pig not being exposed to those causes which render the horse and dog peculiarly liable to disease of the bladder, namely, speed, long and fatiguing exercises, etc., seems to be comparatively exempt from it.

There is, however, a case narrated in the *Veterinarian*, by Mr. Reid, V.S., which we shall quote.

Vesical Calculi.—"A barrow-pig that to the seventh month had manifested perfect health, from that period fell rapidly away (although its appetite remained unimpaired), so much so in fact that in two months more it was a mere bag of bones, and the owner had it destroyed. He attributed this decline to a difficulty in passing its urine, which distressed the animal to such a degree that every time it wanted to stall it quite moaned with pain, rolling upon its back, arising, and again posturing itself for stalling, arching its spine and making violent efforts, which too often were ineffectual. At other times, and indeed oftenest, he, after much straining, succeeded in passing a little urine, but this was speedily followed by fresh efforts. Occasionally, after having rolled about and laid on its back, it obtained relief by a flow of urine in a full stream. The urine was at all times perfectly clear."

This account was sufficient to draw Mr. Reid's attention to the presence of vesical calculi. He regretted that he had not been called in during the life of the animal, that he might have made it the subject of operation, and requested permission to examine the carcass.

The bladder was half-full of limpid urine, in which floated the stone. The internal coat of the bladder about the inferior part exhibited slight blushes of inflammation. All round the neck it was deeply inflamed, and thence the reddening spread about an inch into the urethra. The peritoneum also exhibited a light tint.

Inversion of the Bladder.—A sow littered in the morning and brought forth ten pigs without any apparent difficulty, and immediately afterwards something resembling the bladder, and which appeared to be about half full, came out. The owner, seeing that it did not come away, became alarmed, and sent for the pig butcher, who said it was the womb, and that it must be put back, which he accordingly endeavoured to do, and having passed two or three stitches of small twine across the labia to retain the parts, left the animal. Mr. Neale, V.S., of Burbage, happening to hear of the occurrence, called to see the sow. He found the vagina considerably protruded, or at least that there was a protrusion of the size of a man's fist, and in a sloughing state there. She appeared, however, in good condition, got up without apparent pain or difficulty, and was suckling her young well. The urine was flowing drop by drop. As the owner declined having anything done to her, Mr. Neale ordered the parts to be bathed with a decoction of bark. Four months afterwards she was killed for bacon, and weighed 160 lbs. Upon opening her the uterus was found to be perfectly healthy, the vagina as clean as possible, and the tumor reduced by sloughing to the size of a lemon; the bladder was completely gone. The kidneys were full of white purulent matter of about the consistence of cream. The uterus led directly from the kidneys to the protruded part, at the inside of which, and just below the anus, was a formation of matter about the size of a hen's egg. There was not the slightest trace of inflammation in any of the surrounding parts.

Protrusion of the Rectum.—This is an evil of not unfrequent occurrence in swine, arising chiefly from obstruction of the intestines. Where the cause is simply obstruction, an operation will remedy it; but as the obstruction is too frequently attended with rupture of some of the intestines, it will perhaps be as well to have the animal slaughtered at once, especially if it is in tolerably good condition.

Hernia.—There is little doubt but that umbilical and congenital hernia are of frequent occurrence among swine; but as yet the attention devoted to

the diseases of these animals has been so slight that we dare not venture positively to assert the fact.

The Skin.—The skin of the hog, like that of most other animals, is composed of three separate parts or layers. The first or exterior of these is the *cuticle* or scarf skin, which covers the whole surface of the body and protects the more sensitive parts from the injuries which might result to them from immediate contact with external agents. It is a thin, tough, callous texture, perforated with innumerable holes or pores, through which pass the hairs and bristles, and whence exude those transpirations by means of which the body throws off all vapours injurious to the system. Chemical analysis has proved it to be chiefly composed of gelatine, and consequently insoluble in water of common temperature. This layer is considerably tougher and denser in the hog and other of the pachydermata than it is in the horse, ox, and most of our domesticated animals.

Beneath this is the *rete mucosum*, a soft expansion of tissue which overspreads, and can with difficulty be separated from the layer below it. Its purpose appears to be to protect the terminations of the bloodvessels and nerves of the skin, which it in a manner envelops or covers. This layer determines the colour of the body and of the hair.

The third and undermost part is the *cutis vera* or true skin, an elastic texture composed of innumerable minute fibres crossing each other in all directions, fitting closely to every part of the frame, yielding by its elasticity to all the motions of the body, and interposing its dense, firm structure between the more vital parts of the system and external injuries. Innumerable bloodvessels and nerves pass through it, and appear upon its surface in the form of papillæ; it is in fact far more sensitive than the muscles or flesh.

The skin varies in density in different breeds of swine. In some of the large, old breeds it is thick, coarse, tough, and almost as impenetrable, in comparison, as the hide of a rhinoceros; while in many of our smaller breeds, and particularly in those which have a considerable admixture of Asiatic blood, and in the Chinese pigs themselves, it is soft, fine, and delicate, and bears no slight degree of resemblance to the skin of the human being. It is not to be wondered at that a structure so delicately organized as the one we have been describing should be subject to disease. In the hog it is peculiarly so; many of the most serious maladies to which he is subject have their seat in the skin: it were a point well worthy of study to inquire into the reason of this fact; but as the present work is devoted to practice rather than theory, we must leave it to abler hands, and pass onwards to a consideration of some of the most prevalent diseases of the skin in swine.

Gangrenous Erysipelas.—This disease, which is frequently spoken of by the ancient writers as prevailing to a greater or less extent, and often

almost as an epidemic among sheep and swine, is now of rare occurrence. Poulet thus describes the symptoms:—

"The first of these, which last some five or six days, are uneasiness, inquietude, depression, loss of appetite, and inertness. About the seventh or eighth day these gradually increase in intensity; the limbs totter, the body is alternately hot and cold, the ears drop and are cold, the head appears heavy, the tongue is discoloured, the breath fetid, a thick mucus flows from the nostrils, and the whole of the skin becomes tinged with an erysipelatous redness, which is most evident under the belly; the animal utters almost incessant screams of pain. This inflammatory state of the integuments rapidly merges into decided gangrene, and the whole of the diseased surface becomes of a livid blue or violet hue. The skin is first covered with blisters containing a thin reddish watery fluid; and as these break, the gangrenous, dark coloured scabs are formed. The disease is, however, by no means of so fatal a character in swine as it is in sheep, probably from the former being the stronger animals. A little blood should be taken from the ears, once at any rate, and the bleeding should be repeated if it appears at all necessary. A dose or two of Epsom salts, cooling drinks slightly acidulated, and strict attention to diet and cleanliness, are generally all that will be requisite. Should the skin appear to be very irritable, a little sweet oil may be rubbed over it, or some sulphur made into a kind of ointment with sweet oil or palm oil; but local applications are not generally requisite."

Exposure to great heat or cold, or any sudden transition from one extreme of temperature to another, is supposed by some authors to be the cause of this disease; while others, and we think with justice, attribute it to unwholesome or putrid food, and to general inattention and neglect.

Lice.—Pigs, when allowed to wallow in the mire, and to dwell in filthy styes, are very apt to engender these disgusting vermin, which eat into the skin and render it scabby and ulcerated, and by the irritation they keep up, worry and fatigue the animals, and effectually prevent them from thriving. Eric Viborg states that these vermin sometimes burrow their way into the flesh and come out through the eyes, nostrils, or mouth, or have even been known to be voided in the urine.

The first step to be taken towards effecting a cure is thoroughly to cleanse the skin from every particle of dirt, and to clean out and whitewash the styes and put in fresh dry litter.

Mercurial ointment, turpentine, or tobacco-water, are the most effective agents in the destruction of these unwelcome parasites. A little sulphur may be given internally.

The preventive means are strict attention to cleanliness both in the styes and in the animals themselves. Whenever a pig is observed to be lousy,

which will quickly be perceived by his rubbing himself against the gates, trees, and walls, he must be immediately separated from his companions, or they too will become infested with lice, if they are not already so.

Parkinson is of opinion that "the cause of vermin infesting animals clearly arises, in a general way, from bad feeding, which occasions weakness of the blood; for," says he, "if an animal be ever so lousy, by giving him strong food for a few days the vermin will disappear, probably because the rich blood is poison to them." He considers that a free access to water for bathing, and also occasional exposure to heavy rain, is not only necessary to the general health of swine, but a most excellent preservative against vermin.

Leprosy.—This disease has apparently existed in swine from the remotest periods, and Tacitus gives it as his opinion that it was because the hog was subject to leprosy that the Jews were forbidden to eat of its flesh. It consists in the development of certain vesicles, or whitish granulations, in all parts and portions of the cellular tissue; which vesicles have been proved to be neither more nor less than a species of worms termed the *cysticercus cellulosa*, supposed by some French authors to be of the same species as that found in the brain of sheep. There are, however, considerable differences between these two. The cysticercus is found in all the cellular tissues and soft parts throughout the whole of the body; in the fat, in the adipose matter, in the interstices between the muscles, in the viscera, and, in short, in every crevice into which they can insert themselves. The thigh or ham has been mentioned by some authors as the principal seat of these vesicles, but they are also found on the shoulders, around the jaws, along the neck and belly, and even underneath and around the root of the tongue, where alone can any outward lesions indicative of leprosy be in general discovered; and even here they are not constant, but are chiefly evident in those animals in which the disease has attained to a great height. The progress of leprosy is very insidious, and the early symptoms so little marked that a practised eye only can detect them.

In the onset all that is observable is a certain marked stupidity or obstinacy in the animal; a state of languor and apparent general debility; an evident thickening of the skin; a slight adhesion of the bristles; a tendency in the hair to fall off, caused by the development of a greater or less quantity of those vesicles of which we have spoken, as being scattered in different parts of the fatty tissue, either on its surface or in the interstices of the muscles; under the coats of the viscera, or on the sides of the tongue.

In its successive progress this disease attacks the animal economy more or less profoundly without the functions appearing otherwise troubled. There is ulceration of the cellular tissue, and even of the organs that surround or penetrate it; the animal does not, however, appear to be generally and

seriously ill. Far from losing his appetite, he is occasionally extremely voracious. He does not appear to suffer in the lungs; his breath is not embarrassed, nor is his voice hoarser than usual.

Such is at least what may be observed to take place when the leprous vesicles are not numerous. It is when they increase in quantity, and the disease increases, that they begin to affect the health of the patient. He then becomes indifferent to every thing; moves about slowly; totters as he walks; his eyes are dull; the buccal membrane is pale, and sometimes strewed with violet spots. The expired air is fetid, the breathing slow; the pulse small and irregular, the bristles easily plucked, and sometimes a little blood accompanies them. Strength begins to abandon the patient; he can no longer sustain himself on his hind legs; the posterior part of the trunk becomes paralyzed, the body exhales an unpleasant smell; the skin is thicker, and the cellular tissue is raised in different parts, especially about the kernels of the neck. There is swelling about the roots of the hair, which often proceeds to ulceration; the skin comes off in patches; large tumors are developed; the teeth are ground convulsively together; the tongue is dark coloured, hot, thickened, and covered with slime; the body swells; the animal utters feeble cries of pain, and seldom survives many hours.

This is a very obstinate disease, probably from its having usually taken so great a hold of the system before it is suspected, and numerous have been the medicaments recommended for it. Antimony, sulphur, small and repeated doses of Epsom salts, and general bleedings, seem to be the course of treatment most likely to be attended with success; and these must be aided by strict attention to diet and cleanliness; cooling, wholesome food alone should be given, and water, in which barleymeal has been dissolved. Nothing of a rich or heating nature should be allowed to come within reach of the animal. As external applications, mercurial ointment may be moderately applied to the ulcerated parts, or the common mange ointment composed of sulphur and antimony.

In all probability the reason why this and many other diseases of swine have hitherto been regarded as incurable, is that men of science, educated veterinarians, have as yet given but little of their attention to these useful animals, and deemed the study of their diseases, and of the means of treating them, beneath their notice. Nor is the owner without his share of blame, for he too often either abandons the poor brute to its fate, or calls in the aid of the pig-butcher or some ignorant empiric.

There have been numerous opinions advanced relative to the predisposing causes of leprosy; some authors attribute it to exposure to the inclemency of the weather, insufficient food, and damp marshy localities; and urge in support of their opinion that the disease was much more prevalent and fatal when swine were turned into the woods and forests during certain periods of

the year to seek their own food than it is now when they are comfortably lodged, and more care devoted to their feeding. Others have attributed it to some pernicious qualities in the water which the animals drink, or in the food which is given to them; and with both these parties we are inclined to agree, and to attribute this disease in a great measure to vitiation of the blood.

The wild boar appears to be exempt from it; nor is leprosy known in America, Russia, or Spain, if we may believe the testimony of various authors and travellers.

Some have asserted it to be hereditary; but there are numerous facts on record in which some of the progeny of a perfectly healthy boar and sow have proved leprous, while a diseased sow has produced sound and healthy young.

Another question has likewise been much discussed, namely, the propriety or safety of eating the flesh of pigs that have died of this disease. These animals, however good condition they may appear to be in, are rather bloated than fat; the flesh is soft and flabby, and tasteless, and will not keep; the bacon pale in colour and wanting consistency. Soup made with such flesh is white, greasy, and insipid, and has been known to produce vomiting and diarrhœa. We are not aware that there are any records of disease or other evil resulting from the eating of the flesh of leprous pigs; nevertheless it stands to reason that it cannot be wholesome, and should not be made use of, for although no immediate ill effects may follow the eating of it, we cannot tell what insidious evils such vitiated and diseased food may engender in the human frame.

Mange.—This cutaneous affection, which was formerly attributed to want of cleanliness, or to some peculiar state of the blood, is now generally admitted to arise from the presence of certain minute insects termed *acari*. It is identical with the *scab* in sheep, and the *itch* in the human being, which also were supposed to arise from corruption of the blood or acrid humour subsisting in it, or from filthiness, but which arise from this scabious insect. As far back as the twelfth century these *acari scabiei* were described by an Arabian physician; subsequently they were noticed and described by several German and Italian writers, and in 1812 and 1814 Herr Walz, a German veterinarian, and M. Gohier, an eminent French veterinary surgeon, found these insects in, and gave drawings of, and described those peculiar to, almost all our domesticated animals.

There is a very interesting translation from a pamphlet by Dr. Hertwig, given in the *Veterinarian* for 1838, in which a detailed account of the habits and history of these insects will be found.

The hog does not appear to suffer so much from mange or scab as the horse, sheep, and dog; in swine the pustules are usually chiefly developed

under the armpits and on the interior of the thighs. They at first consist simply of red spots, vesicles, or pimples; but these gradually become connected together by minute burrows or furrows existing beneath the skin, and eventually unite in the form of large scabs, which the animal, irritated by the itching, rubs into large blotchy sores.

Where the mange is recent a tolerably strong decoction of tobacco or digitalis will often prove an efficacious wash for the diseased parts, or a solution of corrosive sublimate; but if the eruption is of long standing, and has degenerated into scabs, a solution of arsenic in the proportion of one ounce to a gallon of water, or, what is still better, sulphur and mercurial ointment in the proportion of an ounce of the former to a dram of the latter, carefully and thoroughly rubbed into the skin, must be resorted to. A decoction of soot has also been recently discovered by an eminent French physician to be exceedingly efficacious in cases of cutaneous disorders. Two handfuls of soot are boiled during half an hour in a pint of water, the fluid is then strained off, and the lotion, when cold, used two or three times in the day. Creosote has also been used with success in the treatment of cutaneous eruptions. If the animal is in high condition, blood should be taken, and two or three doses of cooling physic given, or sulphur mingled with the food. Strict attention must be paid to cleanliness, and the animal kept apart from the rest of the herd. Mange is both hereditary and infectious. There are numerous instances of its having been communicated from one animal to another of a different species, and even to the human being.

In Austria, if mange appears in the hog within eight days after the sale, it is presumed to have existed at the time of the said sale, and the animal is returnable to the vender; and when it can be proved that he was aware of the unsoundness, he not only has to return the purchase-money, but also to indemnify the purchaser for any loss or inconvenience he may have sustained, besides paying a fine equal to one-tenth of the value of the animal.

That the actual disease, namely, the scab and the irritation, arises from the presence and proceedings of the *acari*, there can be no shadow of doubt; but the question is, whence do these *acari* arise? Are they the product of some morbid state of the skin, arising from constitutional derangement, or created by miasma or effluvia? We find mange in animals that are fed on too stimulating food; we also find it in others that are neglected and badly fed. How can these contradictions be reconciled? Here is a vast field for scientific research and experiment. As every grain of earth, and every drop of water, and every particle of air, is peopled with living beings, developed by certain causes, it is by no means an improbable theory to suppose that the germs of the *acari* may exist in a dormant state in the skin, and only be called into actual life by some of the vitiating influences which neglect or mismanagement produces, and, once existing, they follow the law of every

created being, and propagate and multiply, and pass from one animal to another either by actual contact or by the intermediation of some other substance which both had touched. We admit, however, that this is mere theory, and call upon our professional brethren to aid us by their researches in our endeavours to discover the actual truth.

Measles.—This is rather a subcutaneous than an actual disease of the skin, consisting in a multitude of small, watery pustules developed between the fat and the skin, and indeed scattered throughout the cellular tissue and adipose matter. It has by many been regarded as a milder form of leprosy; and, so far as our present limited knowledge will allow us to judge, this supposition appears by no means an erroneous one.

The external appearances attending it are the development of reddish patches, somewhat raised above the surface of the skin, on the groin, the armpits, and the inside of the thighs at first, and subsequently on other parts of the body. The attendant symptoms are acceleration of the pulse, heat of the skin, cough, discharge from the nostrils, loss of appetite, nausea, swelling of the eyelids, feebleness of the hinder extremities, and the formation of blackish pustules under the tongue: eventually the skin usually comes off in patches.

The measles in swine is seldom fatal, and will gradually yield to the simplest cooling treatment, or even to mere attention to diet, temperature, and ventilation. Didymus tells us that Democrates prescribed bruised asphodel roots to be mingled with the food given to hogs, as an excellent remedy for this disease. It sadly injures the quality of the meat, rendering it insipid, flabby, pale, and indisposed to take the salt. We should say that the flesh of measly pigs is positively unwholesome, although, perhaps, there are no cases on record in which it is proved that bad effects have resulted from the use of it.

The following was a remedy for this disorder used by the ancients: "A hog having measles must be put in a sty, and kept there three days and nights without food. Then take five or six apples, pick out the cores and fill up the holes thus made with flour of brimstone; stop up the holes and cast in the apples to the measly hog. Give him first one or two, then one or two more, and then, as being hungry he will eat them, give him all. Let him have nothing more to eat until the next day, and then serve him so again. Thus use him for five or six days, and he will become as well and as wholesome as ever." In our opinion it is one very likely to be beneficial.

It yet remains to be discovered whether measles in swine is an epidemic, like that disorder in the human being, or whether it is hereditary, or whether, as many suppose, it arises from the development and presence of a variety of the *cysticercus*.

Desquamation of the Skin.—The following singular case, com-

municated to the *Veterinarian*, by Mr. J. Sherwood, of Sittingbourn, appears to us not unworthy of record here.

"A few weeks ago the skin became hard on either side about nine or ten inches from the spine, and afterwards kept gradually separating towards the centre of the spine from the shoulder to the insertion of the tail. The bailiff cut off portions from time to time of the weight of nearly ten pounds in order to make the load with which the animal was encumbered the lighter, until the last week, when the hog lay down, and after taking his rest with his brethren (for he fed and looked as well as the rest, with the exception of the load on his back) he got up and left the substance behind him. It consisted of the entire skin so far as it had sloughed, with about two inches of adeps adhering to it in the middle, getting gradually thinner towards the sides, and weighing twenty pounds, which, added to the portions before removed, made a total of thirty pounds. The hog is now computed to weigh 400 pounds. He had not any medicine administered, as he did well the whole of the time."

Bleeding.—This is a most useful and necessary operation, and one which in many diseases is of vital importance. The common and vulgar mode of getting blood from the pig is by cutting off portions of the ears or tail; but these modes of proceeding should only be had recourse to when local and instant blood-letting is requisite. The jugular veins of swine lie too deep and are too much imbedded in fat to admit of their being raised by any ligature about the neck; it is therefore useless to attempt to puncture them—we should only be striking at random. Those veins, however, which run over the interior surface of the ear, and especially towards its edge, may be opened without much difficulty: if the ear is turned back on to the poll, one or more of them may easily be made sufficiently prominent to admit of its being punctured by pressing the fingers on the base of the ear near to the conch; when the necessary quantity of blood has been obtained, the finger may be raised and it will cease to flow.

The palate veins, which run on either side of the roof of the mouth, are also easily opened by making two incisions, one on each side of the palate, about half way between the centre of the roof of the mouth and the teeth. The flow of blood may be readily stopped by means of a pledget of tow and a string, as in the horse.

M. Gohier, who had considerable practice in bleeding swine, was of opinion that the cephalic and saphena veins might be opened without any great exertion of skill by any one who possessed a little knowledge of anatomy. The lancet should be used somewhat obliquely, and a sufficient quantity of blood having been obtained, the flow arrested in the usual manner.

Mr. Cupiss recommends the brachial vein of the fore-leg (commonly called by farriers the *plate*-vein) as a favourable place for bleeding. This vein

runs along the inner side of the fore-leg under the skin, and the best place for puncturing it is about an inch above the knee, and scarcely half an inch backwards from the *radius*. No danger need be apprehended from cutting two or three times if sufficient blood cannot be obtained at once. The vein will become easily discernible if a ligature is tied firmly round the leg just below the shoulder.

Columella tells us "to let blood from the ear," or "strike a vein beneath the tail at the distance of two inches from the buttocks where it attains sufficient size for the purpose, and it must first be beaten with the sprig of a vine; then, when swelled up by the stroke of this rod, opened with a lancet, and, after enough blood has been drawn, the vein must be bound up with the rind of the willow or elm tree."

This operation should always be performed with the lancet if possible; in cases of urgent haste, when no lancet is at hand, a small penknife may be used; but the fleam is a dangerous and objectionable instrument.

Castration or Spaying.—This operation is performed on many of our domesticated animals, with a view of increasing their docility and usefulness, and on others to dispose them to fatten and attain to early maturity; it consists in removing the testicles of the male, and the ovaries, and sometimes a more or less considerable portion of the uterus, of the female.

Pigs are chiefly castrated with a view to fattening them; and doubtless castration has the required effect, and therefore is less objectionable when performed on the pig than when the horse or dog is subjected to it; for at the same time that it increases the quiescent qualities of the animal, it diminishes his courage, spirits, and nobler attributes, and even affects his form. The tusks of a castrated boar never grow like those of the natural animal, but always have a dwarfed, stunted appearance.

If possible, this operation should be performed in the spring or autumn, as the temperature is then more equable, and care should be taken that the animal is in perfect health. Those which are fat and plethoric should be prepared by bleeding, cooling diet, and quiet. Pigs are castrated at all ages, from a fortnight to three, six, and eight weeks, and even four months old. There are various modes of performing the operation; we will begin by quoting those described by Professor Vatel:—Vatel's "Eléments de Pathologie Vétérinaire."

"Castration by simple division of the spermatic cord.—If the pig is not more than six weeks old, an incision is made at the bottom of the scrotum, the testicle pushed out, and the cord cut without any precautionary means whatever. But when the animal is older, there is reason to fear that hemorrhage to a greater or less extent will supervene; consequently it will be advisable to pass a ligature round the cord a little above the spot where the division is intended to take place.

"Castration by tearing the cord.—Swine are thus operated on by some cutters:—An assistant holds the pig, pressing the back of the animal against his chest and belly, keeping the head elevated, and grasping all the four legs together; or, which is the preferable way, one assistant holds the animal against his chest, while another kneels down and secures the four legs. The operator then grasps the scrotum with his left hand, makes one horizontal incision across the base of it, opening both divisions of the bag at the same time. Then laying down his knife, he presses the testicles out with his finger and thumb, grasps them between his teeth and tears them out. He then closes the wound by pressing the edges gently together with his fingers; the tearing prevents all hemorrhage, and the wound speedily heals. This mode of operation is sometimes performed on animals two or three years old. Some break the spermatic cord without tearing it: they twist it, and then pull it gently and firmly until it gives way.

"Castration by sawing or scraping.—Here a portion of the base of the scrotum is cut off, the testicles forced out, and the cord sawn through by a somewhat serrated but blunt instrument. The hemorrhage, if any there be, is arrested by introducing ashes into the wound. The animal is then dismissed, and nothing further done with him. Fromage de Feagre has castrated many pigs of three or four months old by dividing the spermatic cord in this way. This mode of operating, however, should only be practised on very young animals.

"Castration by ligature.—Here a waxed cord is passed as tightly as possible round the scrotum above the epididymis, which completely stops the circulation, and in a few days the scrotum and testicles will drop off. This mode of operating should never be performed on pigs more than six weeks old, and the spermatic cord should always be first of all uncovered."

We cannot approve of the tearing and gnawing the testicles with the teeth; it is a disgusting practice, and inflicts unnecessary pain on the patient; the use of a blunt knife is far preferable, as this lacerates the part equally as much without so bruising it and rendering it painful; and it is the laceration only we require, in order to prevent the subsequent hemorrhage which would occur if the cord were simply severed with a sharp instrument.

The castration by ligature requires great nicety and skill, otherwise accidents will occur, and considerable pain and inflammation be caused. Too thick a cord, a knot not tied sufficiently tight, or a portion of the testicle included in the ligature, will prevent the success of the operation.

The most fatal consequence of castration is tetanus, induced by the shock communicated to the nervous system by the severity of the operation.

In spaying the sow the animal is laid upon its left side and firmly held by one or two assistants; an incision is then made into the flank, the fore-finger of the right hand introduced into it, and gently turned about

until it encounters and hooks hold of the right ovary, which it draws through the opening; a ligature is then passed round this one, and the left ovary felt for in like manner. The operator then severs off these two ovaries, either by cutting or tearing, and returns the womb and its appurtenances to their proper position. This being done, he closes up the womb with two or three stitches, sometimes rubs a little oil over it, and releases his patient, and all generally goes on well; for the healing power of the pig is very great, as the following facts will testify:

Mr. Thompson, veterinary surgeon at Beith, N. B., was castrating a pig, and while cutting through the peritoneum, one of the assistants lost his hold, and the animal sprang up. The scalpel was plunged deep into the belly, entered one of the convolutions of the ileum, and divided one of the guts almost through, besides making a wound in the mesentery. Mr. Thomson sewed up the mesentery with a fine needle and thread, and restored it to its place, and sewed the side with firm stitches—not, however, with much hope of seeing his patient recover. But, to his surprise, two days afterwards little appeared to be the matter, and in a short time the animal was well.

The after treatment is very simple. The animals should be well littered with clean litter, in styes weather-tight and thoroughly ventilated; their diet should be attended to; sour milk or whey, with barleymeal, is an excellent thing to give at these times; it is well to confine them for a few days, as they should be prevented from getting into cold water or mud until the wound is perfectly healed, and also from creeping through hedges or fences.

The best age for spaying a sow is about six weeks; indeed, as a general axiom, the younger the animal is castrated the better it gets over the operation, which is seldom attended by fatal results. Some persons, however, have two or three litters from their sows before they operate upon them; where this is the case, the consequences are more to be feared as the parts have become more susceptible, and are consequently more liable to take inflammation. Lisle says:—"Where this is done, it is best to spay a sow two or three days before her litter of pigs are weaned, because then if harm follows the operation, the young ones will draw off the venom."

Catching and holding the pig.—Swine are very difficult animals to obtain any mastery over, or to operate on or examine. Seldom tame or easily handled, they are at such periods most unmanageable, kicking, screaming and even biting fiercely. Hurtrel D'Arboval recommends the following means of getting hold of them:—"Fasten a double cord to the end of a stick, and beneath the stick let there be a running noose in this cord; tie a piece of bread to the cord and present it to the animal, and when he opens his mouth to seize the bait catch the upper jaw in the noose, run it tight and the animal is fast."

Another means is to catch one foot in a running noose suspended from

some place, so as to draw the imprisoned foot off the ground; or to envelop the head of the animal in a cloth or sack.

But, so far as it can be, all coercion should be avoided, for the pig is naturally so averse to being handled that in his struggles he will often do himself far more mischief than the disease we seek to investigate or remedy would effect.

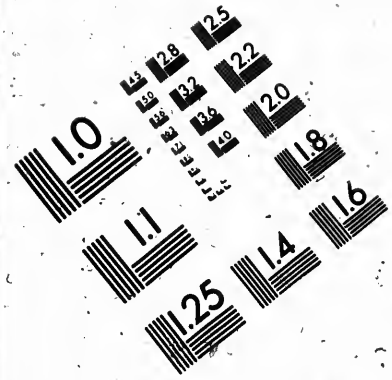
Drenching.—Here again the observations with which we closed the preceding paragraph are applicable, for there are more instances than one on record in which the pig has, in his struggles, ruptured some vessel and died on the spot, or so injured himself as to bring on inflammation and subsequent death. Whenever it is possible, the medicine should be mingled with a portion of food, and the animal thus cheated or coaxed into taking it. Where this cannot be done, the following is the best method:—

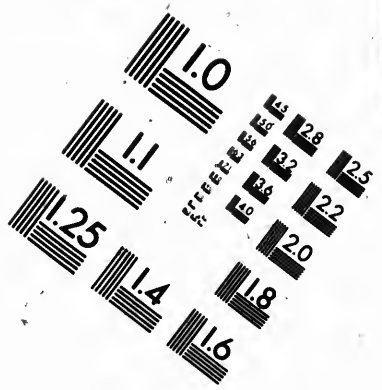
Let a man get the head of the animal firmly between his knees, without, however, pinching it, while another secures the hinder parts. Then let the first take hold of the pig's head from below, raise it a little, and incline it slightly towards the right, at the same time separating the lips on the left side so as to form a hole into which the fluid may be gradually poured, not more being introduced into the mouth at a time than can be swallowed at once Should the beast snort or choke, the head must be released for a few moments, or he will be in danger of being strangled.

Ringing.—The operation of ringing is performed in order to counteract the propensity swine have to dig and furrow up the earth. The ring is passed through what appears to be a prolongation of the septum between the supplemental, or snout, bone and the proper nasal. The animal is thus unable to obtain sufficient purchase to use his snout with any effect without causing the ring to press so painfully upon the part that he is speedily compelled to desist. But the ring is apt to break, or it wears out in process of time and has to be replaced. The operation is most painful, and the shrill squeaks of the animal undergoing it cause it to be a perfect nuisance to the neighbourhood.

John Lawrence gives the following directions concerning this operation: "The snouts of pigs should be perforated at weaning-time, after they shall have recovered from castration; and it will be necessary to renew the operation as they become of large growth. It is too generally neglected at first; but no pigs, young or old, should be suffered to roam at large unrung. It should be ascertained that the sow's rings are sufficiently strong previously to her taking the hog, on account of the risk of abortion from the operation being renewed while she is in pig. Care must be taken by the operator that he go not too close to the bone, and that the ring turns easily."

The far better mode of proceeding is when the pig is young, to cut through the cartilaginous and ligamentous prolongations by which the supplementary bone is united to the proper nasals. The divided edges of the cartilage will never unite again, and the snout always remains powerless.





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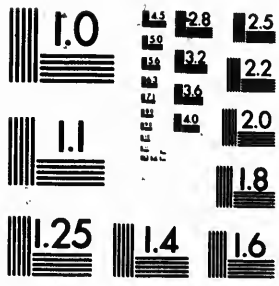

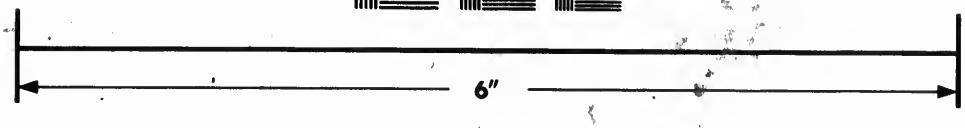

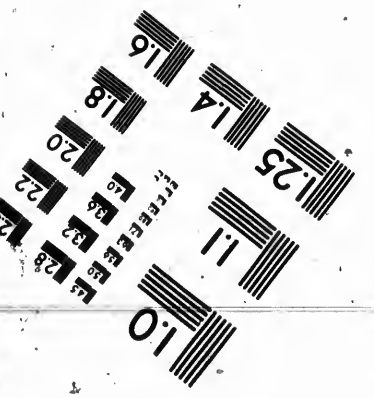

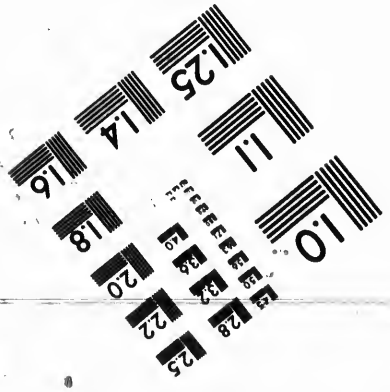

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Poland-China Sow, **FIRST CHOICE,** 8246.

The property of Messrs. J. W. Coffman & Bro., Danvers, Ill.

Poland-China Sow, **FIRST CHOICE,** 8246.

The property of Messrs. J. W. Coffman & Bro., Danvers, Ill.

Small Yorkshire Boar, **SUCCESS 2nd,** at 11 months.
The property of Mr. W. C. Norton, Ridge Farm Herd, Aldenville, Pa.

Horse and Cattle Medicines.

Acids.—These are derived from the mineral, vegetable and animal kingdoms, and are of a sour taste—hence the name acid. Some acids are solid, others fluid, and all are easily dissolved in water. Acids are mostly poisonous, except when highly diluted, or mixed with water.

ACETIC ACID.—This acid is eight times stronger than ordinary vinegar.

Use.—Sometimes used in sprains, and for the destruction of the poison of insects, by adding one ounce of camphor to four ounces of the acid.

PYROLIGNEOUS ACID.—This is gotten by the distillation of wood, and sometimes sold in a diluted form as white vinegar. It is used with salt by horsemen for sore backs and shoulders.

MURIATIC ACID.—This is commonly called the *spirit of salt*,

Use.—A good tonic in debilitating diseases in horses and cattle, and can be advantageously employed in pleuro-pneumonia in cattle, for it relieves the quick breathing, and keeps up the strength.

Dose.—Forty to sixty drops given largely diluted, or mixed with cold water, and repeated three or four times in the day.

Externally.—It is used for sores in the feet of horses, by pouring a few drops in the nail-hole or sore. Ten drops poured into the fistulous openings of poll-evil, or quittor in the foot daily, sometimes cures the disease.

NITRIC ACID, OR AQUA FORTIS.—This, given properly, and largely diluted, is an excellent tonic, and is used for the same purpose, and in the same doses as the preceding.

SULPHURIC ACID.—Possibly this acid is preferable to any other of the acids for *internal* use, in weakness and debility. It is given in from forty to sixty drop doses, also largely diluted with water. Horses and cattle will usually drink water when acid is in it. In all kinds of fevers, sulphuric acid

is an excellent medicine to give. In mixing it, the acid is to be added to the water, not the water to the acid.

PRUSIC ACID.—A highly dangerous poison.

Uses.—Given in locked-jaw in the horse with considerable success.

ACONITE.—*Aconitum Napellus — Wolfsbane — Monkshood.* An active poison, and one of the garden plants of parts of Europe. The tincture is that portion which is used in the diseases of horses and cattle.

TINCTURE OF ACONITE ROOT.—One of the most powerful, certain and successful sedatives which can be used. It has done away with bleeding, blistering and physicking, which were formerly thought proper agents wherewith to combat and cure disease. Nothing controls the circulation and action of the heart so promptly as aconite. The nervous centres of the body are no less ready to obey its action. Hence, its value in allaying fever, irritation excitement and pain, from whatever cause.

How to use it.—Aconite should never be carried too far, or prostration and weakness will follow. Never give more than eight doses, when twenty drops are the dose, or more than six doses when twenty-five drops are the dose. In pleuro-pneumonia and other diseases, iron and the mineral acids should follow aconite.

Alcohol.—Spirits of wine entirely free from water, and is used for making tinctures of the various plants. It is the foundation of many lotions and liniments. Alcohol may be given to horses having a chill, in half-pint doses, mixed with a little warm water, not too hot.

Aloes.—This is the expressed juice of several plants of the same name. Aloes are of several varieties: Barbadoes, Socotorine, Cape, and Hepatic—all of which differ in color, and some of them in strength. Barbadoes and the Socotorine are the varieties kept in the drug stores.

Use.—Aloes is used as a purgative, or cathartic, for horses only. Cattle do not respond to aloes, nor is it a proper internal medicine for those animals.

Dose.—From six to eight drachms, made into a bolus, or ball, with two drachms of powdered ginger, and molasses, to cause them to stick together.

Tincture of aloes is an excellent application to a healthy sore. In the form of a compound tincture, which is composed of aloes and myrrh, it is preferred, by some persons, to the simple tincture.

Alum.—A compound salt, containing sulphuric acid, potash, and alumina.

Use.—It is applied to sores, to arrest bleeding, and, in the form of

burnt alum, is used to touch indolent sores which are not disposed to heal quickly.

Ammonia.—Liquid ammonia is commonly called spirits of hartshorn.

Use.—A diffusable stimulent, and is given in cases of flatulent colic. Formerly it was in much repute among farriers, mixed with oil, as a liniment, but it is not now considered of much value, and is apt to blemish.

Dose.—Two drachms to half an ounce, as an anti-spasmodic, in flatulent colic.

Carbonate of Ammonia.—A highly valuable medicine, when given in weakness, debility, and prostration from influenza, lung fever, bronchitis, etc.

Dose.—From two drachms to half an ounce, which may be repeated three times in the day, and should be given, mixed in cold gruel, so that the latent, or hidden heat, will not be developed, as it would be if given in anything warm, thereby scalding the throat while drenching.

Muriate of Ammonia.—This possesses the same properties as the above, but is not so strong.

Acetate of Ammonia.—Is made extemporaneously, by dissolving the carbonate in strong acetic acid, till effervescence ceases; then, adding water to it, till it is of the strength of ordinary vinegar.

Use.—An excellent form of ammonia when given in weakness and debility. Indeed, ammonia, and its several preparations, need only to be used, to convince of their utility in supporting the vital powers, and thereby curing disease.

Anæsthetics.—Medicines which induce insensibility.

Aniseed.—A warm carminative, and used in conjunction with fenugreek, and cardamoms, in weed, and fevers in milch cows, and for indigestion and loss of appetite in horses.

Dose.—For horses and cows: one to two ounces, given three times in the day.

Anodynes.—These are medicines which allay pain. (See Aconite, Opium, Morphia, Chloroform, and Ether.)

Antimony.—A metal. Many preparations of antimony are kept in the drug stores.

Ter Chloride of Antimony.—This is a useful medicine for the diseases of the feet of horses, cattle, and sheep; it owes its properties to hydrochloric acid. It is commonly called, by old farriers, buttyre of antimony. In foul claw, in cattle, and sores in the feet of horses, a piece of cotton should be moistened with it, and laid upon the sore.

Antiseptics.—Medicines which arrest decay and putrefaction.

Antispasmodics.—Medicines capable of relieving spasms, as in colic

Areca Nut.—An effective cure for tape-worm in the dog.

Dose.—About two grains of the nut, to every pound of the animal's weight, and given in the form of a pill, or suspended in milk.

Arnica Montana.—Leopard's bane.

Tincture of Arnica.—A valuable remedy for sprains and bruises. A lotion is made as follows: Tincture of arnica, one ounce; water, two ounces. Cloths, kept wet with it, should be laid on the part which is sore.

Arsenica.—A well-known poison.

Dose.—When given once a day, five grains will be a safe dose, for an ordinary sized horse. If given twice a day, two and a half grains will be enough.

Arsenic should be given mixed in feed, in large bulk, such as cut feed, so as to protect the stomach as much as possible, whilst at the same time reaping its advantages. These doses should be continued at least for two weeks, stopping at that time for one week, and commencing again as before. This will insure safety, with the benefits of the arsenic, and an improved condition in both wind and body. In Switzerland, and others parts of the world, arsenic is relied upon for the cure of heaves in the horse.

Fowler's Solution of Arsenic.—Made as ordered by the colleges, contains four grains of arsenic, to the ounce of the solution, or fluid.

Asafœtida.—This is a gum-resin, having a smell like onions. Asafœtida is a stimulant and vermifuge, and is given to horses for loss of appetite, and to produce a fine silken coat upon them. It is given to dogs, to expel worms. Dose, for the horse and the cow, two drachms, and for dogs, ten or twenty grains.

Tincture.—Where the stimulant effect is wanted, the tincture is a good form, and is given in about the same doses as the gum, for all animals.

Asarabacca.—This is used in horses where matter is lodged in the nares of the nose, and it is desirable that it should be brought down; and also in sheep and calves, with *faliria bronchi*, or worms in the air passages For horses, blow a drachm up each nostril, out of a cone of paper, taking care that the person does not inhale it himself. For a flock of sheep, or a number of calves, confine them in a close shed, with sufficient air, and throw a considerable quantity among them, so the animals will inhale it. Sneezing and snorting take place, followed by mucous, and small worms from the nose. This action is called *errhine*.

Astringents.—Medicines which are capable of drying up discharges, whether from the bowels, or from a sore. The principal medicines of this class are opium, tannin, alumn oak-bark and chalk.

Atropine.—The active principle of Belladonna.

Belladonna.—Atropia Belladonna.

Belladonna is used in veterinary practice for the same purpose as opium, but is to be preferred to opium on account of its having no binding effect on the bowels. The extract is the preparation used, and is prescribed in all animals, for colic, rheumatism, coughs, sore throat, bronchitis, influenza and locked-jaw. Doses, half a drachm to forty or fifty grains, dissolved in half an ounce of the sweet spirits of nitre, and repeated three times a day, in the diseases above mentioned. In diseases of the eye, it is considered valuable, as it has the power of contracting the iris of the eye, thus causing enlargement of the pupil, and breaking up adhesions between the iris and the lens. It also facilitates operations on the eye.

Benzoin.—A gum-resin, the tincture of which is known as old Friars Balsam, and is an excellent application for sores, and unhealthy ulcers.

Benzole.—This is a watery carbon, and is obtained from coal tar. It is used to destroy lice, and other insects in the skin of all our domestic animals.

Bismuth, Subnitrate of.

Use.—For dogs when affected with vomiting and purging.

Dose.—Five to fifteen grains, given on sugar; may be repeated.

Bole Armenia.—Formerly in great repute among old horse doctors, for many diseases of all the animals, and it entered into almost every mixture. It is not now considered of much value.

Borax.—Or Biborate of Soda. A good application for ringworm, for which purpose dissolve half an ounce of borax in eight ounces of water.

Bromide of Potassium.

Use.—For arresting the growth of fibrous tumors so often met with in all animals.

Doses.—For horses and cattle, from one to three drachms; and for dogs, five to ten grains, repeated three times in the day, for a considerable period.

Buckthorn.—A syrup is made of the berries, and kept in the drug stores, and is recommended as a mild purgative in dogs having distemper.

Calamine.—An impure carbonate of zinc. Oxide of zinc should be

used or substituted for it. Used in the healing of wounds, both in powder and ointment.

Calcium, or Quicklime.

Use.—Lime is used in indigestion and acidity in all animals; in tympanitis in the horse, in hoven in cattle, and in the form of lime-water. Mixed with linseed oil in equal quantities, it makes the celebrated Carron oil, so called from its constant use among the men employed in the Carron Iron Works, when any of them get burnt. Lime-water and calomel make the yellow wash, and corrosive sublimate and lime-water make the black wash, so highly recommended in unhealthy, and in ill-conditioned ulcers and sores. It is used as a disinfectant in stables and barns.

Dose.—Quicklime is given to horses and cattle, in from one to two drachms. Lime-water is given in five ounce doses to horses and cattle. For calves with diarrhœa, two ounces of lime water, a drachm of powdered gentian root, and from three to five drops of the tincture of aconite root, given three times a day, is an excellent remedy.

Calomel.—Chloride of Mercury.

Calomel should be rarely used in horse and cattle practice, from the fact that animals are not so subject to scrofulous diseases and liver complaints as man is, and these are the diseases chiefly calling for calomel, we can in veternary practice do without it, so far as internal use is concerned. For external application, in the form of the *black* and *yellow*-wash, it is valuable. Calomel sprinkled on unhealthy ulcers and sores is valuable, quickly changing their appearance. Calomel is sometimes used in thrush of the foot of the horse, inserted into the cleft of the frog. In cattle with foul claw, and in sheep with sore feet, it can be used to great advantage. A dog can take as much aloes as will kill a man, but a man can take as much calomel as will kill several dogs.

Camphor.—Use.—Camphor is a slight stimulant, followed by calmative effect. Hence, it is recommended in cases of irritation, and nervous excitement, and enters into all mixtures used in cases of chronic cough. Three to five grains of camphor, and extract of belladonna five grains, rubbed down in a little whiskey or alcohol, and mixed in three ounces of water, is an excellent remedy in allaying irritation in dogs having distemper. An excellent remedy can be made with camphor, one ounce; acetic acid, No. 8, four ounces. To allay irritation in a sore, camphor and sweet oil it is a good application.

Doses.—Camphor is given to horses and cattle, in from two to four drachms, repeating the dose three or four times a day.

Cantharides.—(See Spanish Fly.)

Capsicum.—(See Pepper.)

Carbolic Acid.—This is the product of coal tar, and was formerly known to the scientific world as phenile or phenic acid, but it is now generally known as carbolic acid. Its smell resembles that of creosote, which is carbolic acid and a fixed oil, and is very offensive to most persons. Its form is that of an acid solution, though sometimes sold in crystals. Its great importance is due to its property of coaulating the albumen of the animal tissue, and hence its value in sores, wounds and ulcers. It may be applied with safety to all parts of the body and legs, and is invaluable for destroying lice, wood-ticks, and all forms of parasite life, and by merely washing or moistening those parts of the legs and bodies of horses, cattle, and sheep, chosen by the bot, horse or other flies to deposit their eggs, their hatching or even deposit may be prevented.

As a disinfectant in stables or building affected with fevers and all kinds of distempers it was found extremely serviceable, in England, in checking the ravages of the rinderpest, by washing the floors and stalls; and in adding a tablespoonful of the salution of the acid to a bucketful of water, in whitewashing the walls and ceilings.

External Use.—For sores and wounds, when unhealthy, a good application may be made by adding one drachm of the acid to one pint of water. This will destroy all putrefaction, and induce the wound to take on a healthy action.

Cardamoms.—The seeds of a plant.

Use.—Given to milch cows in case of loss of appetite and fevers. Generally it is united with fenugreek ginger, or gentian root, mixed in warm ale or molasses water. This mixture will cure ephemeral or fevers of a day's duration, when other medicines have failed,

Dose.—One or two ounces.

Caraway.—The seeds of a garden plant, and used for the same purposes as the preceding.

Carbonate of Lime.—A chalk which is sold in the drug stores under the name of *creta preparata*, or prepared chalk.

Doses.—For horses and cattle, one to two ounces is the dose. For calves, two to three drachms, given in wheat-flour gruel, with a drachm of ginger, or caraway seed, for curing diarrhœa.

Cascarilla.—The bark of a tree.

Use.—A bitter tonic, and resembles in some particulars that of quinine.

Doses.—For horses or cattle, one or two ounces, mixed in gruel.

Castor Oil.—The expressed oil of the seeds of *Ricinus Communis*.

Use.—However useful castor oil may be as a purgative in the human family, it is certainly a dangerous poison when given in sufficient quantities to induce purging, in either the horse, cow, or sheep. It produces irritation and inflamation of the coats of the bowels, without relief from purging.

For the dog, castor oil may be a proper and useful purgative; and for the pig, also. Aloes and linseed oil is the purgative for the horse; epsom, or glauber, salts for the ox, and the sheep. Whatever suits man, as a purge will answer for the dog and pig.

Cassia.—False Cinnamon. Much cheaper than cinnamon, and may be given to horses and cattle, in powder, mixed in gruel, for loss of appetite.

Dose.—One to two ounces, for horses or cattle.

Catechu.—An extract from a species of *acacia*.

Use.—An astringent, binding the bowels in diarrhœa, and is used in combination with chalk and opium.

Dose.—For horses and cattle, two to five drachms. For sheep and swine, one to three drachms. For the dog, ten to twenty grains.

For superpurgation in horses, and cows, the favorite combination is as follows: Catechu, two to five drachms; prepared chalk, one to two ounces; powdered opium, ten to thirty grains; mix, and drench with wheat-flour gruel.

Chalk.—(See Carbonate of Lime.)

Chamomile.—The flowers of *anthemis noblis*.

Use.—A very mild tonic, possibly too much so for the horse or cow. There are better ones, although, perhaps, not so well known.

Charcoal.—Occasionally given to cows, in chronic diarrhœa.

Dose.—Half an ounce to one ounce, given suspended in gruel, of any kind. Externally, charcoal is very valuable, when applied to badly smelling wounds and ulcers. It immediately corrects the fœtor, and rapidly disposes them to heal. Charcoal and brewers' yeast are good cleansers of putrid sores and ulcers, and are worthy of more extensive use.

Chenopodium Anthelminticum. — Wormseed. An excellent remedy for worms in dogs. Drop from two to five drops of the oil in a little soup, or give from ten to twenty grains of the bruised seed, for four successive nights, and then follow with a dose of castor oil.

Chlorine Gas.—Chlorine gas is prepared by pouring hydrochloric acid on the black oxide of manganese, also by heating sulphuric acid with common salt and the manganese.

Use.—This gas is a disinfectant, and for this purpose it is made and used as follows: Take an ounce or so (depending upon the size of the place to be disinfected) of black oxide of manganese, and hydrochloric acid of sufficient quantity, carry them to the place where they are to be used, pour the one into the other, and close the doors, having first removed all the animals out of the place. A spirit lamp, placed under the bottom of the vessel holding the materials, will insure a greater volume of gas. (See Disinfectants.)

Chloric Ether.—Chloroform, dissolved in spirits of wine.

Chloride of Potassium.—Is similar to chloride of soda, or common salt.

Chloride of Lime.

Use.—As a disinfectant, from its antiseptic and deodorizing effects, and is an excellent stimulant to unhealthy ulcers. Chloride of lime has been highly recommended in tympanitis in the horse, and hoven in cattle, arising from eating wet clover.

Dose.—From two to four drachms, given mixed with cold water.

As a disinfectant it may be sprinkled on the stable or barn floor every morning; but a good way would be to suspend it in a box, having many holes in it, and hung from the roof of the house. If the house be large, two or more boxes may be used.

Chloroform.—*Terchloride of Formyle.*

Use.—Chloroform is an excellent stimulant, when given to horses having a chill or shivering fit, from congestion or from cold, and is equal to turpentine for the cure of colic. An excellent liniment is made, by adding one ounce of chloroform to two of olive oil.

Dose.—Chloroform is given to the horse and cow, in doses from one to two drachms, mixed in weak whiskey, and repeated every two or three hours or till the colic is relieved.

Inhalation.—The inhalation of chloroform, by either horse or ox, is attended with risk, provided the animal be not secured or tied, so that it cannot get loose; because some horses and cattle become completely wild, when the effects of the inhalation commence to act upon the brain. On the other hand, some horses will quietly stand up, others as quietly lay down under it.

Two to four ounces are sufficient to produce anasthæia, or loss of sensibility. The usual way of giving chloroform, by inhalation, is by pouring about two ounces of chloroform on a soft and moist sponge, whilst the animal is tied down, and holding the spong to one nostril only, covering the nose loosely, with a large towel, to save the fumes of the chloroform, using

great care not to exclude the admission of pure air with the fumes of the chloroform.

In all operations lasting any length of time, whether in the horse or the cow, humanity and fine feeling demand the outlay of a little chloroform. It is not necessary to completely destroy all feeling—just sufficient to blunt the sensibility of the nerve centres.

Cholgaoegues.—Medicines which increase the flow of bile.

Examples: Calomel, podophyllin, irridin, leptandrin, etc.

Cinchona.—*Peruvian, or Jesuit Bark.* There are several barks of cinchona, used in medicine, and from which the sulphate of quinine is made. Cinchona, or its barks, are not used in horse and cattle diseases.

Quinine is the only preparation used; but its high price is against its general use in veterinary practice. Among valuable horses, it is frequently used to hasten recovery from influenza, lung fever, etc.

Dose.—Twenty to forty grains, repeated from three to four times a day.

Quinine is apt to be adulterated, as proved to be the case with many samples that were tested.

Cochineal.—An insect used as a dye for coloring tinctures and other medicines for the purpose of deception. Druggists color water with it, for filling the show bottles usually found in their store windows.

Cod Liver Oil.—In all animals, cod liver oil increases fat and flesh. In diseases affecting digestion and assimilation cod liver oil can be of no use. It materially relieves broken wind or heaves in horses. For hastening, or forcing animals intended for show, cod liver oil is just what is wanted, as it not only hastens the fattening process, but increases the quality and appearance of the meat.

Dose.—For swine, two ounces daily. For small pigs, one ounce.

Colchicum.—*Meadow Saffron.* The seeds and root are the parts usually employed in medicine, sometimes in powder; but the best is in the form of tincture.

Use.—Given in all rheumatic affections of the joints, and in lumbago, and also in diseases of the eye of the horse, depending on rheumatism of that organ.

Dose.—Of the crom or seeds in powder for horses and cattle, the dose is from one to two drachms, given in the animal's feed twice in the day, for a week or two. The wine of colchicum will answer for the dog, in from five to fifteen drop doses, twice a day in a little water.

Collodion.—This is a solution of gun-cotton.

Use.—Collodion is used for dressing wounds and cuts, instead of sticking

plaster, and is applied in the following manner: Clip the hair from the edges of the wound, take a camel's hair pencil, or a soft brush, and paint the surface and edges of the wound well, and in a few minutes, the ether, which holds the gun-cotton in solution, evaporates, leaving over the sore a complete covering, resembling the gold-beater's skin, thus completely shielding the sore from the action of the air. Hence, its value.

Copper, Sulphate of.—*Blue Vitriol.* This is one of the most useful articles that can be used in horse and cattle diseases, both internally and externally. Internally used, sulphate of copper is a powerful tonic and builder up of the system. Farcy, glanders, purpura, etc., in the horse, have, in several cases, yielded to its effects. Sulphate of copper should never be given alone, but should be combined with gentian or ginger. After the fever has passed off in cases of pleuro-pneumonia, the sulphate of copper is an excellent medicine to support the vital powers, and prevent effusions in the chest, which is the cause of death, in most cases, from this disease.

Dose.—In horses and cattle, one to three drachms are the proper doses, given twice in the day.

The external use of the sulphate of copper is often called for as a caustic in wounds and sores growing proud flesh, which are readily controled by it, simply by touching the parts with a piece of the crystal in powder, or in solution.

For diseases of the eye, I think it has no superior. For this purpose, use three grains of the powdered sulphate to an ounce of rain water, and apply with a soft feather, or what is better, a camel's hair pencil.

For wounds which have no proud flesh in them, eight or ten grains to the ounce of water is a good and cheap application.

Copper, Acetate of.—This is used only for sores in the form of an ointment. Take of the acetate or virdigris one drachm, and add to it an ounce of the simple ointment. Sores have been known to heal from its use, which have bid defiance to almost every other application.

Corlander.—The Seeds. This is a useful article, and may be considered an excellent medicine for young calves having weak stomachs. The bruised seeds should be given, in two drachm doses, in the milk which is given to the calf.

Creosote.—This is a peculiar smelling fluid derived from tar. Creosote has had the credit of curing glanders in man, and is a good remedy in pleuro-pneumonia in cattle, but we have better ones, and not so costly.

Dose.—For horses and cattle, use from one to one and a half drachms, made into a mass, with flour and molasses, and the whole crumbled down into some gruel. Make a drench, to be poured down the throat.

As an external remedy, it is of great advantage in mange, sores, ulcers, caries of the bones, canker, thrush in the horse's feet, and the foot-rot so troublesome in sheep. Indeed, the more the virtues of creosote are known to farmers, raisers and breeders of stock, the more will it be valued and the greater will be the advantages derived from it.

Croton Oil.—A dangerous medicine when improperly used, but a useful one nevertheless, when hasty action of the bowels is wanted, as in milk fever in cows.

Dose.—For the cow ten to fifteen drops, given along with epsom or glauber salts.

Digitalis.—*Digitalis Purpura.* The action of this powerful medicine has been much sought for as a sedative in lung diseases; but since we have become acquainted with the superior quality of aconite, digitalis is not now nearly so much used.

Doses.—For horses and cattle, twenty grains of the powdered leaves.

Disinfectants.—We have, in two portions of this book, referred to the importance of a better acquaintance on the part of farmers and stock raisers with this subject.

Volatile Disinfectants may be divided as follows:

1. *Chlorine.*
2. *Nitrous acid fumes.*
3. *Sulpuhrous acid.*

These diffuse themselves through the air of stables and barns, and neutralize the poisonous gases which are given off from the excrement of animals, whether in health or disease.

Fixed Disinfectants.—These are such as can be mixed with the *excreta* and decaying matter, without destroying them for manure.

1. *Perchloride of iron.*
2. *Permanganate of potash.*
3. *Gypsum—Sulphate of lime.* This is not a great one, but it is useful.
4. *Charcoal.* This, in fine powder, should be thrown into damp stables and barn-yards, as it will not only remove unpleasant smells, but will make good manure. Refuse tan bark, and other vegetable substances, made into charcoal is cheap, and of great utility as a disinfectant, and adds to the quantity and value of the manure.

Fixed, but Ntoxious Disinfectants.—These are disinfectants which, when mixed with manure, render it valueless as such.

1. Chloride of Zinc. (Burnet's Disinfectant Fluid.)

2. Nitrate of Lead. (Ledoyer's Disinfectant.)

3. Sulphate of Copper, and Zinc Solution. (Larnaudes.)

Chlorinated Soda Solution may be mixed with manure, without destroying its qualities as such.

Chloride of Lime. Solid, or in powder, does not destroy the manuring qualities of vegetal and other materials usually converted into manure.

Diuretics.—Medicines which, when given to animals, increase the flow of urine. They are used in cases of swellings and dropsies of the body and legs of horses.

Elecampane.—*Inula Helenium* The root of this plant is highly thought of, and much used, by horsemen, in coughs and colds. Some make a tea of it, or decoction, and give it to the horse to drink. It is certainly a warm and grateful aromatic, and a good expectorant. The plant should be gathered when the seed is ripening.

Elm Bark.—Slippery. This bark, when scalded with hot water, makes a useful poultice for irritable wounds, ulcers and sores. A decoction of the bark will answer every purpose for which flaxseed or linseed is used, or recommended, as in diseases of the kidneys and bladder, produced by the use of Spanish fly, and from over-dosing with rosin, and other diuretics. In diarrhœa, in all animals, slippery elm tea, or decoction, will serve a good purpose, by sheathing the covering of the bowels, which is so apt to become irritated and inflamed in violent superpurgation.

Emetics.—Medicines which produce vomiting. Horses cattle, and sheep cannot vomit, whilst the stomach remains entire. In cases of rupture of that viscus, however, vomiting is occasionally seen. Emetics are useful in diseases of the dog and swine. Tartar emetic, or sulphate of zinc, given in from two to five grain doses, will cause dogs and swine to vomit.

Epsom Salts.—Sulphate of Magnesia. This is a valuable medicine, in diseases of cattle and sheep. No other purgative should ever be thought of, or given to either cattle or sheep. Even supposing other purgatives to be as good, none, certainly, can be so cheap as epsom and glauber salts, or the sulphate of soda. For all purgative purposes, the one is as good as the other. Salts should be highly diluted with water; for the quantity of fluid given with them facilitates their operation. In domestic practice, half an ounce of salts, in a tumbler full of water, will operate as strongly as one ounce in half the quantity of water.

Doses.—For ordinary sized cows, one to two pounds is the dose, mixed with three to four quarts of cold water; one ounce of ginger in powder, and the whole sweetened with molasses, or coarse sugar. For average sized calves, two to four ounces; for sheep, two to four ounces. A few drops of

commercial sulphuric acid—say twenty to sixty drops, will greatly improve the nauseous taste.

Ergot.—Diseased Rye. This is a curious, as well as a valuable medicine.

Use.—In the calving, lambing, and foaling season, it is sometimes of great service, but should be carefully handled; as, for instance, if given to any animal about to deliver her young, and when the mouth of the womb containing the young is not sufficiently opened, the administration of this remedy would be attended with extreme danger, as the womb, by the powerful contraction set up, caused by the ergot to expel its contents, would likely be ruptured, or torn, followed by the death of the animal. When the animal seems to have exhausted its strength, and the passage is open, and the young is coming in a natural way, then only should the ergot be given. If there should be a malformation in the young, or in the pelvis of the mother, it would be equally unwise to give ergot.

Doses.—For a mare, or cow, half to one ounce of the powder is the dose. For sheep, swine, and large sized bitches, one drachm is the dose. Small bitches, ten to thirty grains.

Essential Oils.—Volatile Oils. (See Oils.)

Ether.—Sulphuric Ether. This is a valuable article of the veterinary *materia medica*, and is used in diseases of all animals.

Use.—It is used as a stimulant, and is given in weakness, fevers, and in colic, as an antispasmodic. Ether is scarcely strong enough to produce anasthæsia in horses and cattle.

Dose.—For horses and cattle, one to two ounces is the dose as a stimulant, and antispasmodic. Ether should be given in cold water, to prevent its volatilization on its exposure to the air. Twice its own volume of alcohol added to it makes the spirit of sulphuric ether.

Euphorbium.—A resinous juice, expressed from a cactus-like vegetable which grows in Morocco.

Use.—This is only used for external purposes, and is among the very few articles in veterinary medicines capable of blistering the thick skin of the ox.

Expectorants.—This is a class of useful medicines, which cause a separation of the mucus from the throat, and air passages, thereby relieving cough and other symptoms usually attendant upon throat diseases.

Febrifuges.—Medicines capable of relieving fever.

Fenugreek.—The seeds of this annual plant, found growing in the

south of Europe, is a useful cattle medicine, given in one ounce doses, for loss of appetite, ephemeral fevers, etc. It is usually, however, combined with ginger, gentian, and other medicines of that class.

Fern.—The Male. *Asphidium Felix Mas.*

Use.—Given to animals affected with worms. A good remedy.

Doses.—For the horse, one pound of the root in powder is the dose. For sheep, three to five ounces. For the dog, with tape worm, it is invaluable, destroying the worm in two hours. A purgative should be given next day.

Friar's Balsam.—This the compound tincture of benzoin, and is an excellent article when applied to sores and wounds, as the fluid soon evaporates, and leaves a resinous covering over the wound, thus shielding it from the action of the air. (See Benzoin.)

Galbanum.—A dried juice, having medicinal properties similar to asafœtida.

Galls.—Nut Galls. These are rough excrescences on oak trees resulting from holes being made in the bark by an insect.

Use.—A powerful astringent, binding the bowels of all animals affected with dysentery and diarrhœa. Also a good application to the greasy heels of horses.

Doses.—For horses and cattle, powdered galls are given in from four to six drachms. For sheep and swine, thirty to sixty grains. When externally applied the powdered nut may be sprinkled on the sore.

Gallic Acid.—(See Tannin.)

Gamboge.—This is a gum resin from a tree growing in the Island of Ceylon.

Use.—A useful purgative for cattle. (See Epsom Salts.)

Doses.—For cattle, six to eight drachms is the dose. For sheep, thirty grains, given in solution, should be given with other medicines of the same class.

Gentian Root.—*Gentiana Lutea.* This is an invaluable medicine in the treatment of diseases of horses and cattle, where the appetite is to be restored and kept up. In debility, weakness, swellings of the legs and body, and where the stomach is out of order, as is the case so often in fevers, and as a sequel to debilitating diseases, gentian, combined with iron, is an excellent tonic, and cheap. Gentian, combined with ammonia and pimenta berries, will make a horse eat almost whether he will or not.

Doses.—For horses and cattle, half to one ounce is the dose, repeating

it three times in the day. For sheep, one drachm. For dogs, five to ten grains. For horses and cattle, it is best given mixed in gruel, and in a drench out of a strong necked bottle. Gentian root should enter into all condition powders.

The colleges order a tincture to be made, but the powder is all that is wanted in the treatment of horse and cattle diseases.

Ginger.—*Zingiberis.* A well known root, and a useful article to have in the house.

Use.—Ginger is given in cases of gripes, or colic, whether in horses or cattle, and should enter every dose of purgative medicine given to all the animals. Ginger is useful in loss of appetite in horses, and in calves is an excellent medicine to give with chalk, and other things, in scours, or diarrhœa.

Doses.—For horses and cattle, one to two ounces is the dose; for sheep, two drachms; for calves of three months old, one drachm, and for younger ones, less. The essence of ginger, of the drug shops, is well adapted to use, as the active principle of the ginger is given without so much inert or dead matter.

Glauber's Salts.—Sulphate of Soda. A good purgative for cattle and sheep. (See Epsom Salts.)

Glycerine.—A fluid which scarcely ever dries up, and is the saccharine principle of **fats.**

Use.—Many sores on all animals readily heal by the application of glycerine, especially scratches, and sores about the heels of horses. Glycerine will be found invaluable for the use of companies, in all our cities, having horse railroads, where the authorities allow the use of salt on the streets, for the removal of snow. The slush so formed first chills, then scalds the skin of the heels, so that in a short time the skin cracks, and nasty sores are the result, which are difficult to cure. To prevent this condition of things, and to protect the heels of horses from the injurious effects of the salt and slush, the application of glycerine should be made to the heels morning and midday, whilst the salt, slush and snow are upon the streets.

Guaiacum.—This is a resin.

Tincture of Guaiacum.—A valuable medicine in cases of rheumatism in old horses, and in rheumatic lameness in dogs.

Dose.—For horses, the dose of the tincture will be half an ounce twice in the day, given in cut feed, or in a drench with cold water. For dogs, ten to twenty drops, given in a spoonful of cold water or soup.

Gum Arabic.—Gum Acacia. This is an importation from Alexandria, in Egypt. There are several varieties of gum.

Gum Senegal.—This is similar to the above.

Gum Tragacanth.—This is another variety of gum.

Use.—The gums are demulcents, emollient and soothing to an inflamed part, as the bowels in diarrhœa, the kidneys and bladder, when diseased and irritated.

Doses.—For horses and cattle, from one two ounces. For calves and sheep, four drachms. Gum should be given, dissolved in warm water, and drenched out of a bottle or ox horn.

Hartshorn.—This is an impure solution of ammonia. (See Ammonia.)

Hellebore.—*Hellebrosus Niger.*

Use.—Recommended in poll-evil, wherein a piece of the root is to be inserted in the fistulous opening. No dependence should be placed in it. Better agencies are at hand.

Hemlock.—*Conium Maculatum.* Formerly recommended in inflammation. It is of benefit in the form of a poultice to cancerous sores.

Iodine.—A chemical preparation manufactured from kelp or sea-weed and used both rightfully and wrongfully in many diseases. However, iodine ifself is, of little value as a medicine; but when united chemically with iron copper, mercury, lead, arsenic and potassium, it certainly is one of the most useful and indispensable of medical agents, given internally, and applied externally.

Dose.—Iodine is given to the horse and ox in from twenty to forty grains; for dogs, use from three to six grains. An ointment of iodine is made as follows; Take one part of iodine to eight parts of lard. This is a good ointment to apply to soft swellings on the body of the horse, and should be applied by rubbing with the hand.

Iodide of Potassium.—Hydriodate of Potash. This is a chemical union of potash with iodine, a costly remedy for horse and cattle diseases, and in most cases can be done very well without. Its action is that of an absorbant, and it is, therefore, used in swelling of the glands, and other parts of the body. To get its full benefit, it should be given in syrup or molasses, so that the iodine will not be lost, leaving the water only behind.

Dose.—From twenty to thirty grains for horses and cattle, repeated three times in the day. For the dog, five grains.

Iodide of Arsenic.—Highly recommended by some persons for glanders, farcy and purpura in the horse.

Dose.—Five grains given once a day, in cut or mixed feed.

IODIDE OF COPPER.—A valuable remedy, but costly. It should be used only for valuable horses, in cases of debility and loss of condition, mingled with cut or mixed feed.

Dose.—From one to two drachms, given twice or three times in the day.

IODIDE OF IRON.—This is even more valuable than that of the iodide of copper, and is given for the same purpose, and in the same doses. To use the iodide of iron once, will insure its use again. Its high price is the only drawback.

IODIDE OF SULPHUR.—A valuable remedy in mange, and other skin diseases, which may be given internally also, in the same disease.

Dose.—For horses, give two to four drachms in the animal's feed. For mangy dogs, give ten to fifteen grains once a day. Give it at night, as warmth assists its action very much.

IODIDE OF LEAD.—Too weak for veterinary practice, but excellent for swellings on the body of man. It is only used externally. Iodide of lead is of a beautiful yellow color.

IODIDE OF MERCURY.—Bin-Iodide of Mercury—Red Iodide of Mercury, etc. This preparation of iodine is a medicine that the educated veterinary surgeon cannot do without in the practice of his profession; for there is nothing which will so well meet his wants. Iodide of mercury is not used internally, in any disease, as calomel contains the same internal action as that of the iodide.

Use.—It is used in all cases of induration and swelling of the glands of the neck; tumors, whether of bone or soft tissue; splints, spavins, ring-bones, wind-galls, shoulder-joint lameness, or thoroughpin, and will answer well for an ordinary blister, for whatever purpose. The only objection to it, as a blister over an extensive surface, is its painful operation.

The iodide of mercury is used as an ointment as follows: One part of the red iodide of mercury to eight parts of hog's lard, well mixed together. This ointment is to be well rubbed into the parts to be cured; swelling will follow its action, but will subside in a few days, if one application be enough —which will be known, if the enlargement has been broken or has disappeared. If not, apply in from five to six days again, scarcely rubbing so hard as at the first application, as the skin is more easily acted upon at this time. But whether one, two, or half a dozen applications be necessary, let sufficient time elapse before each succeeding application, so as not to prevent the hair growing, thereby blemishing the part. Apply lard once a day between each application, and occasionally wash the parts with water, not too warm, and lard, or oil the part when dry. The horse's head should be tied up, so that he cannot get at the parts with his mouth. A few hours will be long enough. Place plenty of soft bedding under the feet, so that, by stamp

ing or moving, the horse will not be liable to in any way break or injure his feet.

Observe.—When, apparently, the tumor, gland, or other enlargement, does not disappear, or go away at once, surprise is sometimes expressed to see it totally go away, as if of its own accord. Thus the red iodide of mercury exercises a powerful influence, long after its use has been dispensed with. Iodide of mercury, occupies, in external diseases, as prominent a position as the preparations of aconite do in internal affections, whether in horses or cattle.

Several other preparations of iodine are made by the manufacturing chemists; such as the iodide of gold, and silver—which are of no use in horse and cattle diseases.

Ipecacuanha.—*Cephaelis Ipecacuanha.* In veterinary practice, ipecacuanha is only used for dogs, in fifteen to thirty grains, as an emetic, when first attacked with distemper.

Iron.—*Ferrum.* This is one of the most valuable medicines we have to recommend, in many of the most important diseases, of all the animals; a fact readily seen, when it is stated that iron is a constituent of the blood of all warm-blooded animals, and without iron being in proper quantity in the blood of an animal, it cannot be healthy—is *anæmic*, or impoverished in blood. In fact, iron is an elementary principle, essential to health.

Metallic iron is rarely used in veterinary practice, except it be in the form of iron filings, given by some persons, in cases of worms in horses. The sulphate is just as good for this purpose. Iron filings, called *Ferrum Redactum*, are much used in the weakly and sickly female. To prevent the filings from oxidizing, or rusting, they are put into a tube, similar to a gun barrel, at a strong heat, and are then plunged into cold water, which give them a sky-blue color; the finer the blue, the better the medicine. For the valuable dog, iron filings, in this form, may be given, in from five to ten grain doses. The following preparations of iron will be used for the horse and ox:

Carbonite of Iron.—*Ferri Carbonas.* This preparation of iron is only used in veterinary practice; for the dog, on account of its mildness.

Sesquioxide of Iron.—Rust of Iron—*Ferugo.* This form of iron is only used by veterinary surgeons, in poisoning from arsenic, as an antidote, by forming in the stomach an insoluble arsenite of the protoxide of iron.

Sulphate of Iron.—*Ferri Sulphas*—Green Vitriol-Copperas. This is one of the best, and cheapest preparations of this valuable metal, that can be used in diseases of horses and cattle.

Use.—In medicinal doses the sulphate of iron is tonic and astringent; therefore, it is used in cases of weakness, want of condition, looseness of the bowels, swellings of the legs, body, sheath, breast, etc. It is improving, adding richness to the blood, and giving tonicity and health to the fibrous,

serous tissue, from which the fluid causing the swelling arises. In pleuro-pneumonia in cattle, after fever has abated, nothing will restore and prevent effusions of serum, or fluid, in the chest, like sulphate of iron; and effusions in the chest of cows, and neat cattle, is the cause of very many deaths. The effusions form connecting links between the lungs and the side, from which adhesions take place in that disease, and from which the animal can never be restored to good health, although it may live for a year or two. How important, then, is a medicine offering so much hope!

In addition to the diseases just named, sulphate of iron is the medicine to be used in all cases where the powers of life are low and depressed. In red water in cattle, bleeding internally in all animals, dysentery, purpura, scarlatina, and in debilitating diseases generally, no medicine offers so much hopes of success as the sulphate of iron.

Observe.—Sulphate of iron should not be given while inflammation and fever lasts; it is time enough to give it after all irritation has subsided. It should always be combined with a vegetable tonic, such as gentian or ginger. Iron changes the dung to a green color, as if the animal was at pasture.

Doses.—for horses and cattle, the dose is two or three drachms, with the same quantity of powdered gentian, two to three times in the day, to be given, mixed in a quantity of cold water. Drench out of a bottle, if the animal does not eat it readily, mixed with cut, or soft feed.

Perchloride of Iron.—Whether in a fluid or solid state, this preparation is valuable for bleeding wounds, to stop the flow of blood—which it will readily do, if properly applied, and the blood vessel that is wounded is not too large. It should be applied with a soft brush, or a pledget of soft cloth or cotton dipped in it and laid over the wound, and kept bandaged. Perchloride of iron should be kept in every farm, or country house, for this purpose. It should be kept in a glass-stoppered bottle to keep it pure.

Jalap.—*Convulvulus Jalapæ.* This root derives its name from a town in Mexico, called Xalapa, and grows fully six thousand feet above the sea level. It is, in veterinary practice, used only as a purge for the dog, in from twenty to sixty grains.

Juniper Berries.—*Juniperis Communis.*—The Fruit. This medicine is valuable in horse and cattle diseases, as a stimulant to the stomach in loss of appetite, and in convalescence from debilitating diseases.

Dose.—For horses and cattle, one to two ounces is a dose. Dogs, twenty to forty grains.

Kino.—A juice of several plants. This is used as an astringent in diarrhœa in all animals, and is considered more powerful than catechu.

Kousso.—The flowers of this plant are brought from Abyssinia.

Use.—To dispel, or destroy tape worm in man, and the dog, and is prepared and used in the following manner:—Take of kousso half an ounce, of warm water half a pint; let it stand till cool, and give it, flowers and all; and give next day a dose of castor-oil.

Laudanum.—(See Opium.)

Laxative.—A mild purge.

Lead.—Oxide of Lead.—This preparation of lead is used in the manufactuer of common sticking plaster, or Diachylon.

Iodide of Lead.—(See Iodine.)

Acetate of Lead.—Sugar of lead. Solution of acetate of lead is known by the name of Goulard's Extract of Lead, and was formerly, and is still by some persons recommended, and used in cases of sprains, and as a wash for diseased eyes. Better and less injurious agents are now used by the educated veterinary surgeon.

Observe.—Goulard's Extract, or lead-water, should never be used in diseases of the eye, as it can do no good beyond what cold water can do, but it dulls the eye, by making it hazy and opaque.

Lime.—Oxide of Calcium.

Lime, Carbonate of.—(See Chalk.)

Linseed.—*Linum Usitatissimum.* Ground flaxseed makes the best poultice, as it is less irritable and retains its moisture better than most articles in use for that purpose.

Cake Meal.—That portion which is kept after the oil has been expressed from the seed, is a good feed for horses and cows, given occasionally, and makes a good and much cheaper poultice than the most costly seed.

Linseed Oil.—*Oleum Lini.* This is a good and safe purgative for the horse, and should be given by farmers and non-professional persons in preference to any other article. The English veterinary surgeons use linseed oil for colic in the horse, in the following combination: Linseed oil, one pint, and two ounces each of oil of turpentine and laudanum. In cases of choking, in either horses or cattle, a half pint of linseed oil should be poured down the throat, so that by its emollient properties the substance may pass readily down the gullet.

Doses.—For horses, one to two pints is the dose used for a purgative. For scalds and burns, linseed oil is mixed with lime-water.

Liquorice Root.—*Glycyrrhiza Radix.*—This was formerly in use for making balls for horses, but it is now superseded by molasses.

Logwood.—This is a valuable medicine not well known, and consequently not appreciated.

Use.—One of the very best astringents for binding the bowels in diarrhœa and dysentery, in all animals, and especially when accompanied with irritation of the bowels. Logwood is cheap, sold in chips, and is prepared and given in the following manner:

Logwood chips, two ounces; boiling water, one pint. Allow it to stand till cold, then strain through cloth, or a fine sieve.

Dose.—For horses and cows, this quantity will make one dose. For calves with scours, one to three ounces will be the dose, which repeat if the case demands it. A safe remedy, and cheap.

Lunar Caustic.—(See Silver.)

Lupulline.—The Hop. Makes a good poultice, applied to the udder of cows, when lumpy and hard.

Lytta-Cantharides.—(See Spanish Fly.)

Magnesia.—Oxide of Magnesium. Used sometimes for young foals and calves, when they have no appetite. A good antidote for arsenical poisoning.

Dose.—For these animals, two drachms to six is the dose. A little ginger should be added to it to prevent griping.

Carbonate of Magnesia.—Magnesia Alba. The action of this is similar to the preceding.

Sulphate of Magnesia.—(See Epsom Salts.)

Manganese.—A metal used as a disinfectant, in combination with some one of the mineral acids. For the way to use it, see Disinfectants.

Marsh Mallow.—*The Root of Althea Officinalis.* Used in the form of an ointment, but not of much utility. It, however, still holds a place in horse and cattle medicines. It can be done without.

Marigold.—*Calendula Officinalis.* A garden plant.

Tincture of Marigold.—This is a good application to sores, ulcers, and abscesses, and is applied with soft cloths, saturated or moistened with it, and laid over the affected part. It is a new remedy in burns and scalds.

Mercury.—A liquid metal called quicksilver. In its metallic state it is not used as a medicine. Quicksilver has no action whatever on the animal system, either in health or sickness.

Mercury with Chalk.—Gray Powder. Used in diarrhœa in calves, in

doses from ten to fifteen grains, given with a little ginger, and mixed with wheat-flour gruel.

IODIDE OF MERCURY.—(See Iodine.)

BI-CHLORIDE OF MERCURY.—Corrosive sublimate. A dangerous poison, and should never be given to any animal. It is, however, used in solution, in some skin diseases, as in ring-worm and mange. When so used, only a small portion of the body should be washed with it in one day. For this purpose, take four grains of the sublimate to two ounces of rain water. For a dog, two grains to the ounce, in water, will be strong enough.

NITRATE OF MERCURY.—Ointment. This is the citron or golden ointment, and is a good remedy in ring-worm. Unfortunately, however, it spoils with long keeping, and not being made extemporaneously, it is often rancid and of little value.

OXIDE OF MERCURY.—Red Precipitate. Used in the treatment of unhealthy ulcers and sores, in the form of powder and ointment. It is the principle in the yellow-wash already spoken of in connection with the sub- of lime.

SULPHATE OF MERCURY.—Turbith Mineral. A medicine of no use, which should be expunged from the books on horse and cattle diseases.

SUB-CHLORIDE OF MERCURY.—Calomel. In the form of the black-wash, and sprinkled upon sores, it is a good remedy. Calomel is recommended for thrush in the feet of horses, and is inserted in the cleft of the frog.

Mercurial Ointment.—This is sold in the drug stores. The ointment of mercury is chiefly used in skin diseases, as mange in horses and dogs. But a better remedy will be found in sulphur and its preparations which are not only more safe, but more certain of curing the case.

Mezeron.—*Daphne Mezerum.* A plant, from the bark of which an extract is made, and from the extract an ointment composed of one drachm to four parts of lard, which is used for the purpose of keeping up the irritation of blisters.

Morphia.—(See Opium.)

Muriatic Acid.—(See Acids.)

Mustard Seed.—*Sinapis Nigra.* Used as an irritant on parts of the body where the Spanish fly would be improper and dangerous. On the belly, and over the loins, are the usual places where mustard is applied. In lumbago, and sprains of the back and loins, and in pain in the bowels, mustard is useful. The mode of application of mustard is as follows: If the hair of the part be long, cut it off, then foment the part with warm water, and im-

mediately rub into the parts a handful of the best flour of mustard. This is more effectual than laying a paste or poultice without rubbing.

VOLATILE OIL of mustard makes a good counter-irritant, when a few drops are rubbed into the skin. Vinegar added to the skin does not, as is thought, produce a better effect. Warm water answers every purpose.

Myrrh.—A gum resin, used in the form of a tincture and a compound tincture, for sores, and a good application in sore mouth, from the bit, or other cause.

Narcotics are medicines which act upon the brain, and thereby allay pain. Example: Opium and its preparations, aconite, and chloroform.

Neat's Foot Oil.—Used for skin diseases, and for allaying the irritation of blisters and keeping the skin from cracking.

Nervines.—Medicines relieving pain, without producing narcotism.

Nitric Acid.—(See Acids.)

Nitre.—Saltpetre. This medicine has long been used as a diuretic, and as a febrifuge in low fevers. Cheaper and better medicines are daily in use for this purpose.

Nux Vomica.—*Strychnos Nux Vomica.* An active poison in large doses, but a valuable agent in the cure of diseases in all animals. The powdered nut is uncertain in its effects, therefore the tincture, and the alkaloid should only be used.

Use.—A nervine, and used when the nerves are depressed and weak, just as aconite is used when the nerves are strong and excited. The one medicine is used in depression, and the other in diseases with exalted symptoms. Paralysis or palsy is the loss of power of the parts affected. Therefore, nux vomica is used in twitching of the muscles of all animals; and in glass eye in the horse, depending upon the want of nervous energy in the optic, or nerve of vision.

TINCTURE.—Dose. For horses and cattle, the dose is from ten to twenty drops, repeated three to four times in the day.

STRYCHNINE.—Dose. To horses and cattle, give one grain, once a day, gradually increasing the dose till three grains are given in the day. To get the full benefit from it, it will have to be given for a week or two, if the beast has not got well by that time. In the use of strychnine, care and good judgment must be exercised, for it must be remembered that however useful a drug, or medicine may be, its abuse is readily accomplished. Strychnine should be administered in feed, if the animal will eat it; if not, give it in gruel in the form of a drench. Twelve grains will kill a full grown horse.

Oak Bark.—*Quercus Cortex.* This is a good astringent for outward

use, or for sores which discharge or run matter. The bark is boiled: half an ounce to a pint of water. This decoction is an excellent remedy for drying up the moisture of greasy heels, so troublesome in horses. In diarrhœa in calves, given in four drachm doses, much good will result.

Oil.—There are two varieties of oils used in medicine—fixed and volatile.

Fixed Oils.—Castor, olive, linseed, croton and neat's foot oil. The uses of these oils will be found treated of under their respective heads.

Opium.—*Papaver Somniferum.* The dried juice of the white poppy, and is one of the most remarkable substances in nature. There are several varieties of opium: Turkey, Egyptian, East Indian, Persian, and European opium. The medical preparations of opium are several:

Morphia, or Morphine, is the most important preparation of opium, and sold in the drug stores in the form of white crystals, as also in that of a liquid—liquor morphia acetas, and liquor morphia sulphus. Either of these preparations of opium are much better medicines than the crude opium itself. Each fluid ounce contains *one* grain of the morphine, or the true principle of the opium, and one grain of morphine is equal to three grains of opium, or to forty-five drops of the tincture of opium, commonly called laudanum.

Use.—Opium is a narcotic, or reliever of pain, and is especially recommended in milk fever in cows.

Dose.—The dose of the acetate, sulphate, or muriate, in crystals, for the horse, is from twenty to forty grains. For the cow with milk fever, from forty to eighty grains. To a medical man, such large doses may seem enormous, for in man the dose is from half to one grain.

Horses will scarcely show the least effects from the administration of from two to four drachms of the powdered opium. On cattle, opium has even much less power than on horses. Cows can take one ounce, and sheep half a drachm of powdered opium, without suffering. The doses of crude, or powdered opium for horses, are from one to two drachms, and for cattle, two to four drachms. In veterinary practice, opium is not now so much used, as aconite answers almost every purpose for which opium was given, and without in any way binding the bowels. But in case of milk fever, opium, or its alkaloid morphia, is well worthy of a trial, and if taken in time, will scarcely disappoint any one.

Tincture of Opium.—Laudanum.—Every fifteen drops of the tincture contain one grain of opium. Laudanum is the most costly of all the preparations of opium; and not only that, the large quantity of alcohol, or spirits of wine it contains, is a decided objection to its use in many diseases. Crude opium rubbed down with a little water will be far better when it is to be used at once, or not kept for any time. Laudanum is used in lotions and

liniments for the relief of pain, and it enters into eye washes, for the same purpose.

Wine of opium contains spices. Not much used.

Codia, narcotine, narceine, paramorphia, papaverine, meconine, and meconic acid, and the various constituents of opium, but they are not used in medicine, either in domestic or veterinary.

Battley's sedative drops, so well and familiarly known throughout the world, wherever the English language is spoken, though a secret, are known to contain opium, water and a little spirit, and are one-third stronger than laudanum.

Pariera Brava.—A root which is to be sliced, and have one pint of water added to one ounce of the root. Boil, and strain when cold. This is a good tonic for horses. Mix with the feed, half a pint to the dose.

Peach Leaves.—One ounce infused in the same way as tea, with one pint of water, is an excellent application for the skin of animals having the itch and skin diseases.

Peppermint.—*Mentha Piperita.* The essence of this garden plant is sometimes given to horses having colic, and given in doses of twenty drops. Dogs can have three drops for a dose, in the same disease.

Pepper.—A plant and fruit of the genus Piper.

Black Pepper.—*Piper Nigrum.* Occasionally given to horses affected with colic.

Jamaica Pepper.—Pimento—Allspice. This is a valuable medicine for horses and cattle affected with fever, loss of appetite and indigestion.

Doses.—From three to five drachms, and given in combination with ammonia.

Capsicum.—Cayenne Pepper. This is also used for the same purpose as the above, and given in from twenty to thirty grain doses.

Pepsin.—The active principle of the gastric juice of animals. Its cost prevents its use in calves having diarrhœa, when the discharges are like milk. A good substitute for pepsin is rennet, which farmers should have about them, not only for cheese-making purposes, but for use in looseness, or scours in calves. It assists the stomach to digest the milk, which, in diarrhœa, lays upon the stomach, without being digested or changed. Hence, the white diarrhœa, so often seen in calves.

Petroleum.—Rock-oil. This substance was formerly highly recommended in chest diseases, but it has been succeeded by more certain and successful drugs for this purpose. However, it is still occasionally used as an external application for sores, and for the destruction of lice, etc., in the skin.

It is apt to leave a blemish by causing the hair to fall off, and in some cases, in which it was used too extensively, the hair did not come again. The better way to use coal-oil is to mix equal parts with some other oil having no acrid principle.

Phosphorus.—An elementary substance resembling wax. There is, however, another resembling brick dust, when in a mass. The preparations of phosphorus are numerous: Hypophosphate of ammonia, hypophosphate of iron, and the phosphate of lime, or bone, or earth, phosphate of soda, and of quinine. Phosphoric acid, diluted, is the one which should be used in veterinary practice.

Phosphoric Acid.—Is used in diseases of the bones of young colts.

Doses.—For young colts, the dose will vary from ten to sixty drops, given diluted in cold water.

Pitch.—Burgundy Pitch. The concrete juice of the *abies excelsa*. This is used in the composition of the plaster, formerly used over the loins, in weakness, sprains, lumbago, etc., in the horse. Not now recommended.

Pomegranite Punica.—Granatum. The bark of the root of this tree is used for the destruction of tape-worm, in all animals. Take of the bark, one ounce; water, one pint; and boil down one half. The dose for the dog will be a small wine-glassful.

Poppies.—(See Opium.)

Potash.—Oxide of Potassium. Preparations of potash are many:—

Caustic Potash.—Used, as its name indicates, as a caustic. Many persons object to it on account of its fluidity, which is considered to be its most valuable property; as, if it did not readily assume a fluid form, its caustic properties would not be so good. Indeed, according to its fluidity, when applied to a part, so is its caustic property. For the quick reduction of proud flesh, it has no superior.

Carbonate of Potash.—This is sometimes used as an antacid, but is not much used in horse and cattle diseases.

Sulphuret of Potah.—*Hepar Sulph.* Liver of Sulphur. This is a valuable remedy when applied to mange in all animals. Dissolve an ounce in a pint of water, first having rubbed the mangy part with fine sand, to expose the insect to the action of the sulphuret.

Sulphate of Potash.—(See Glauber's Salts.)

Iodide of Potash.—(See Iodine.)

Nitrate of Potash.—(See Saltpetre.) The acetate, and tartrate of potash, are not used in veterinary practice.

CHLORATE OF POTASH.—Used for the same purposes as the nitrate, and in the same doses. The same may be said of the permanganate.

Prussic Acid.—(See Acid.)

Pumpkin Seeds.—An excellent remedy for destroying tape-worm.

Purgatives.—Medicines which empty the bowels.

Pyroxylic Spirit.—Wood Naphtha. Used to relieve chronic cough, and is given in half-ounce doses in gruel.

Quinine.—(See Cinchona.)

Rennet.—(See Pepsin.)

Rhubarb.—*Rheum Palmatum.*—Rhubarb is a tonic and purgative in dogs, and other carnivorous animals, but in horses and cattle it has scarcely any effect whatever, further than improving the appetite. Better, and much more efficient and cheaper drugs are used in horse and cattle diseases. The dose of the spiced rhubarb is from one to two teaspoonfuls, repeating it two to three times a day.

Ricinus Communis.—(See Castor-Oil.)

Rochelle Salts.—A Tartrate of Potash and Soda.

Saffron.—*Crocus Sativus.* (See Colchicum.)

Sagapenum.—This is a gum, and is used for the same purposes as assafœtida.

Sal Ammonia.—Chloride of Ammonia. (See Ammonia.)

Salt.—Table Salt. Chloride of Sodium, a valuable condiment, when given with the food of animals. Salt is a laxative in horses, cattle and sheep, and is considered a preventive of sheep rot.

Sal Volatile.—This is the compound spirit of ammonia. (See Ammonia.)

Sassafras.—*Laurus Sassafras.* This is a favorite remedy with farmers for their horses, and is given to them in the spring of the year, to strengthen and improve the appetite. Sassafras may be given to horses, either in the form of a powder, or as a decoction, or tea, and mixed with the food.

Saracenia Purpura.—Indian Cup or Pitcher Plant. This plant is found growing along the coast of Labrador, and the shores of the Gulf of Mexico, on wet and marshy land.

Use.—This plant has recently proved to be one of the most useful in the

whole list of medicines, and from all accounts, it is, and will still be a blessing to thousands who may become affected with small-pox. For small-pox in cattle and sheep, it is not only a sure remedy, but also, as good a preventive for the disease. The form and manner of using this medicine is in that of a tea. The time, however, will soon be, when the chemist will provide us with an extract, or an alkaloid of this plant, which will enable us to give the essence of the plant without any inert matter. Take from one to two ounces of the dried root, and slice in thin pieces, place in an earthen pot, or other vessel, and add a quart of cold water, and allow the liquid to simmer gently over a slow fire for two to three hours, so as to lose one-fourth of the quantity

Dose.—Give to cattle half a pint; and to sheep, two wine glassfuls; repeating the dose in six hours, when a cure will generally be affected.

Savin.—*Juniperus Sabina.* The oil of juniper is used in veterinary practice, for the purpose of destroying worms in all animals.

Doses.—For horses and cattle, the dose is from three to four drachms, and for the dog, three to five drops. An ointment of the dried savin tops is used for the purpose of keeping up the action of blisters. Take one part of the fresh tops, to sixteen parts of lard.

Sedatives.—Medicines which allay inordinate action of the heart.

Senega, Polygala Senega.—Snakeroot. This, like other of our native herbs, is often used by country folks in the spring of the year. They give a decoction, or tea of the snakeroot to their horses. It is an excellent remedy in coughs, bronchitis, cold, etc. Take one ounce, boil in a pint and a half of water, and strain through a sieve or strainer.

Dose.—For a horse, half a pint, mixed in his feed, night and morning.

Sialagogues.—Medicines which increase the secretion of saliva, such as aconite in large doses, and second crop clover, after it has been exposed to cold nights or a little frost.

Silver, Nitrate of.—Lunar Caustic. Used as a caustic to unhealthy sores and ulcers; and a solution, three to four grains to an ounce of rain or distilled water, is used to the eye in purulent ophthalmia. The nitrate of silver is too costly for general use. The sulphate of copper, or blue stone, will, for most purposes, answer as well, and is very cheap.

Soap.—A combination of fatty acid with an alkali.

Soap Liniment.—Opodeldoc. A very useful application for sprains, bruises, and for stiff joints.

Soda.—A mineral alkali.

CARBONATE OF SODA.—Useful as an antacid, in doses of from two to four drachms.

SULPHATE OF SODA.—(See Glauber's Salts.)

SULPHITE OF SODA.—This is made by passing a stream of sulphurous acid through a concentrated solution of carbonate of soda. It is a valuable article in the treatment of diseases of horses and cattle. The sulphite of soda possesses the power of neutralizing the action of zumins, ferments, or leavens, when introduced into the circulation. Professor Polli, of Milan, has clearly demonstrated that this substance is capable of purifying the blood of noxious matter, and further, he has through his experiments upon dogs, claimed that glanders can be cured by it; for he says, that forty-five grains of the *virus* of glanders taken from the nares of the nose of a glandered horse, and injected into the circulation of a dog, after the disease had shown itself in the dog, was readily cured by the administration of the sulphite of soda. Upwards of seventy cases have thus been experimented upon by this distinguished professor—all going to show the value of soda, as a purifier of the blood, by its alterative effects.

Sulphite of soda is a remedy in all cases of eruptions on the skin, farcy, glanders and purpura in the horse, and in pleuro-pheumonia and rinderpest, etc., in cattle. Wherever pus is thrown out as a product of disease, the sulphite of soda should be given. Dogs with distemper should have it to keep the circulation pure of pus. The blood of the dog becomes contaminated in this way, and hence, the good dog falls a victim to this scourge of fine bred animals.

Doses.—For horses and cattle, the dose is from half an ounce, to one ounce, given twice in the day. For dogs, twenty grains given in camphor water. In farcy and glanders or other diseases, accompanied with debility, the soda should be combined with gentian and other tonics.

Spanish Fly.—*Lytta Cantharides.* An insect ground into powder, and mixed with lard or oil, making what is familiarly known as a blister. The Spanish fly is, besides its blistering qualities, a very valuable internal medicine, a powerful tonic and alterative.

Dose.—Spanish fly is given to the horse in five grain doses once a day only, and mixed in cut or soft feed. Horses are more easily affected by the Spanish fly than mares. Blisters of Spanish fly are made as follows: Powdered Spanish fly, one drachm; hog's lard, six drachms; mix, and apply by rubbing with the hand into the part to be blistered; wash off the part the next day, oil or lard it for a week, and the swelling will leave when the irritation has gone out of the part.

The tincture of Spanish fly was formerly used as the basis of the old sweating blister. An excellent application for the removal of a splint, or

soft tumors about the legs of horses, is made as follows: Tincture of Spanish fly, one ounce; oil of croton, twenty drops; well rubbed into the part, it acts like magic; that is, if the tumor can be removed at all by any means.

Specifics.—Medicines which cure disease, but the manner of action is unknown.

Spermaceti.—This is a solid crystalline fat, found in the large head of the sperm whale. There is a plan, however, by which it is said that spermaceti can be made out of the muscles of a dead cow or horse, by enclosing the flesh in a box perforated with holes, and sinking it in a running stream of water for a month or more, when the flesh will be converted into a mass of tough, solid matter. After which, it is treated with nitrous acid, poured over it to remove the offensive smell, and to separate the fat. Another plan is, to pour nitrous acid over the flesh without immersion in the brook, and which is said to convert the flesh in the short period of three days, into a yellow colored spermaceti. Another plan is mentioned by Lord Bacon, in his work Sylva Sylvarium, in which he says that the flesh of an animal may be changed into a fatty substance, by cutting it into pieces, putting it into a glass vessel, covering with parchment, and allowing it to stand for six or seven hours in boiling water. Experiments of this kind mind might result in profit to those who would undertake them. The use of spermaceti in horse and cattle diseases, is for the making of ointments and salves, especially in hot weather, when lard cannot be conveniently carried without the risk, not only of losing a portion of the ointment, but of soiling the clothing, or other articles coming in contact with it.

Spirits of Nitrous Ether.—Sweet spirits of nitre is well known to persons as a good household remedy for fevers, etc. In the treatment of diseases of horses and cattle, sweet spirits of nitre is used as a stimulant and antispasmodic. It is also used in the case of a horse having a chill, and in colic. For colic, it was formerly given in combination with laudanum.

Dose.—For horses and cattle, the dose of sweet spirits of nitre will be from one to two ounces, given in cold water to prevent loss.

Spirits of Wine.—Alcohol. This is used for making tinctures for medicinal purposes, from the various plants in use. It is also a good stimulant; much better than the whiskey which is so often poured down the throats of horses affected with colic.

Sponge.—A valuable article for the cleansing of wounds and sores.

Starch.—A good remedy in diarrhœa in all animals, when combined with a few grains of opium, and a little ground ginger, or a few drops of the tincture, commonly called the essence.

Styptics.—Substances having the quality of stopping bleedings from wounds. Examples: Perchloride of iron, cobwebs, the hot iron, and the bandage.

Sudorifics.—Medicines which produce sweating.

Sugar of Milk.—Much used by homœpathists, both domestic and veterinary, in the form of powder, but oftener in the form of globules or small pellets. Not recommended for the treatment of any disease. Molasses is the best form in which to give sugar to animals, and it is useful in cases of sick cows, mixed in a drench.

Sugar of Lead.—(See Acctate of Lead.)

Sulphuric Acid.—(See Acids.)

Sulphur.—Brimstone.—Sulphur is sold in the drug stores in three forms, flowers of sulphur, milk of sulphur, and sulphur *vivum*.

Use.—Sulphur is chiefly used for skin diseases, in the form of an ointment. It is believed by many persons to be a great preventive of diseases and distempers in all animals, and is one or the ingredients of an incongruous mass extolled and recommended by the Hon. Isaac Newton, Commissioner of Agriculture, as a preventive of cattle diseases. Whatever may be the medical virtue passed by sulphur, it certainly has no prophylactic effects mixed with tar, etc. The simple ointment of sulphur is made as follows:—One part of the flowers, or sulphur vivum, mixed with four parts of lard. In winter, when lard is hard, oil should be used instead, thus forming a liniment of sulphur more easy of application.

Doses.—Sulphur, as a laxative for horses and cattle, should be given in doses from one to three ounces, and administered in gruel, in the form of a drench. For dogs, the dose is one to two drachms. It is not recommended as an internal medicine.

Sulphate of Zinc.—White Vitriol. This is a valuable article for healing wounds and sores. It is not administered internally to any animal, except as an emetic to dogs. As an external wash for sores, one part of zinc to twenty of rain-water, will answer for most purposes. For eye-wash, three to four grains to the ounce of water. This is one of the best applications which can be applied to the eye in cases of purulent ophthalmia.

Tannate of Glycerine.—An excellent application for the eyes, in purulent ophthalmia, and for moist sores, wherever situated upon the body.

Tannin.—This is the acid of barks, and is valuable, mixed with water, in running ulcers and sores, and in diarrhœa in all animals. The powder sprinkled upon bleeding sores, will in many cases stop them. One drachm to

a pint of cold water makes a good eye-wash, and in many cases dries up the scum, and removes it altogether. It is certainly a cheap and useful remedy, and can do no harm to the eye.

Doses.—For horses and cattle, in diarrhœa, the dose of tannic acid is from half to one drachm, given in gruel as a drench. For calves with the same disease, give from ten to twenty grains as a dose, mixed with wheat-flour gruel. Snuffed up the nostrils by man, in bleeding from the nose, it will in most cases arrest it at once.

Tar.—*Pix Liquida.* Tar is not now used internally to the extent it formerly was. As an external application, tar is still used on sores about cattle, to keep the flies off; and it is used to make stopping for horses' feet, singly, and mixed with clay. It is kept in every horse-shoeing shop for putting on the soles, usually with cotton, and having leather nailed on with the shoe.

Oil of Tar.—This is an excellent application when mixed with equal parts of sweet, or some fish oil, to promote the growth of horn on the foot of the horse. To give it a dark color to suit the foot, lamp-black may be stirred in, in sufficient quantity to make a black hoof ointment, which will be found an excellent formula for this purpose.

Tartar Emetic.—(See Antimony.)

Tobacco.—*Nicotiana Tabacum.* Tobacco is used as a medicine, principally in skin diseases, and for the destruction of lice and other insects in the wool of sheep. Tobacco smoke is a favorite remedy with some veterinarians, for the removal and killing of worms, and in constipation and colic. For these purposes, better and safer agents are in every-day use. Tobacco in all, or any of its forms, is dangerous, being followed by great sickness, nausea and prostration.

Tragacanth.—(See Gum.)

Turpentine.—*Terebinthæ.* The various varieties of turpentine in market.

Common Turpentine.—The produce of the *pinus palustris* of North Carolina, and other States, and also of Norway, and the north of Europe. The *Pinus sylvestris*, or Scotch fir, yields considerable turpentine.

Venice Turpentine.—This is procured from the *Larix Europea.*

Canada Balsam.—Procured from *Abies Balsamæ*, and is considered to be the purest of all the turpentines; hence it is called sometimes the balsam of Gilead.

Frankincense.—A product of Norway and the north of Europe. This variety enters into the composition of what is known as Burgundy pitch, and

is used in veterinary practice for making adhesive plasters for the loins of horses having been sprained, or having lumbago.

Oil of Turpentine.—This is commonly called the spirits of turpentine, and is used very largely in horse and cattle diseases, both for internal administration and external application.

Uses.—Oil of turpentine is a powerful stimulant, diuretic, and antispasmodic, and is, therefore, used in colic in the horse, in puerperal apoplexy in cows, and in general debility in all animals. As an external embrocation, it is very efficient when combined with an equal portion of sweet oil, but very dangerous when applied to the skin of the horse alone. The horse will become restless, and, in some cases, utterly unmanageable.

Doses.—The doses of oil of turpentine for horses and cows are from one to two ounces, always mixed with its own bulk of oil, especially for horses. For dogs affected with tape-worm, half to one drachm is the dose, mixed with the dose os an egg.

Rosin, or Resin.—The residue left from the distillation of turpentine, which is chiefly used by horsemen to cause the horse to urinate more freely. Much mischief is often done to horses by the administration of rosin. Indeed, most diseases of the kidneys and of the loins can be traced to over-dosing with this substance. The oftener rosin is given to the horse, the more he appears in the eyes of the driver to stand in need of his favorite dose. The kidneys become over-worked, the desire to urinate is more frequent, less urine is voided each time, and the man does not see the mischief he has already done, but hastens to give the horse more to remedy the urinary defect he has thus been instrumental in producing. It will be well to remember that powerful diuretics, like powerful purgatives, tend only to weaken and debilitate. If there be a urinary defect, find out the cause, and, if possible, have it removed, and the effect will cease, but do not attempt to do so by force, and against all science and common sense. Other preparations of turpentine have already been noticed.

Ursæ Ursi.—The leaves of the whortleberry. They were once in repute in diseases of the horse, but are now fallen, and others have taken their place. They were used chiefly in diseases of the bladder and kidneys.

Valerian.—*Valeriana Officinalis.* However useful valerian may be in nervous irritation in man, it is not so useful in veterinary patients. Camphor, and the gum resins, or assafœtida, answer our purpose better than valerian.

Valerianate of Soda.—This has been found useful in chorea, or twitching of the muscles in the dog, in doses of from one to two grains.

Valerianate of Iron.—A good tonic for the dog.

Valerianate of Quinine.—An excellent remedy for agues in man.

Veratrum.—White Helebore. If we had not so useful a sedative medicine as we have in aconite, we would certainly recommend the tincture of white hellebore-root, in all diseases for which aconite is recommended. On account of its being more dangerous than aconite, in case of over-dose, we will not say much more about it, as wherever white hellebore is found in the country stores, aconite will be there also. Hence, there can be no good reason for recommending it when aconite can be procured.

VERATRIA.—The alkaloid of white hellebore, and is one of the most destructive of the deadly poisons. Nothing could be more so than this preparation of hellebore; and what is more, at present, no test is known whereby to detect its presence within the stomach or system.

Wax.—This substance is used for giving hardness and consistency to ointments, and is a favorite in the form of shoemaker's wax, for the purpose of filling up cracks and holes in the feet of horses, to keep out sand and dirt. To be applied as follows: Make the wax in the form of a stick, so that it can be held by one end, while you hold a hot iron to the other, and hold it over the hole or crack, so that the warm wax will drop into it. When the part is full, wet the finger, and by this means the wax can be smoothed, so that ordinary observers can scarcely observe a deficiency in the foot. The hole or crack must be perfectly dry, and free from moisture, or else the wax will not stick very long. When dry, and the wax is put properly in, it will last for a month, or till the next shoeing time.

Willow Bark.—A much neglected, valuable and cheap medicine. This bark has within it a crystalline substance called *salicine*, which is an excellent substitute for the expensive quinine. Farmers and others will do well to gather it in sufficient quantity, and have it dried; and in the spring of the year, or when any of the horses are weak, or out of sorts, take of the willow bark one pound, and boil in four quarts of water, till two quarts are left; then strain for use, and give a tumblerful, mixed in cut feed, once or twice in the day. This will be found much better than the black snakeroot spoken of under its proper head.

Yeast.—Brewer's yeast is one of the best applications for an unhealthy sore or ulcer, as it immediately changes its look and smell. A mixture of yeast and charcoal is a domestic remedy not to be overlooked in the treatment of sores, especially in the summer time. The yeast and the charcoal are to be mixed in the form of a poultice, and used as such, occasionally changing it so that full benefit may be given to the sore by its use. After the sore is cleansed and corrected, it may be then healed as a simple, healthy sore, by other remedies amply described through the book.

Zinc.—There are several preparations of zinc, which are used in the

treatment of horse and cattle diseases, but chiefly in the form of external application.

Oxide of Zinc.—This is a white powder, like wheat-flour, and is useful when applied as a powder in greasy heels and other sores which discharge a sanious fluid from them. Oxide of zinc is often used in the form of an ointment mixed with lard. An excellent ointment is also made by soap shaved down, moistened with a little water, and having oxide of zinc added to it. This is a good form for greasy heels and scratches on horses that have to work every day. It keeps down irritation and fever, prevents swelling of the legs, and is easily washed off on the horse coming into the stable for the night.

Carbonate of Zinc.—This is used under the old name of calamine, either in the form of a powder or an ointment. The ointment is made by adding four parts of lard to one of calamine. It is good for healing sores.

Sulphate of Zinc.—This preparation of zinc has already been described under the head of sulphate of zinc.

Chloride of Zinc.—Butter of Zinc. This, as well as the other forms of zinc, is not used as an internal medicine, except the sulphate, which is occasionally given to the dog as an emetic.

Chloride of zinc is a powerful disinfectant and deodorizer, and is used in the healing of wounds and sores. The solution is the usual form of using it. Two grains of the chloride of zinc to an ounce of rain-water, makes a good eye-wash. For ordinary sores, four to five grains of the zinc to one ounce of the rain-water, is a good application. One characteristic of the preparations of zinc when applied to sores is, no proud flesh can or will arise during their use. The chloride of zinc is used by some veterinarians as a caustic, but for this purpose better caustics, and cheaper ones, will be found elsewhere described.

Acetate of Zinc.—This is made by dissolving oxide or carbonate of zinc in acetic acid. The chief use of the acetate of zinc is for the healing of wounds. In European stables it is employed for the purpose of wetting bandages applied to old hunters and other horses, whose legs cannot be otherwise kept fine and free from swelling. The bandages usually employed in such cases are made of wash-leather, which is so extensively used for drying carriages after being washed, and is called chamois leather.

Zingiberis.—(See Ginger.)

Zyloidine.—This is a white substance, which is insoluble, and is obtained from starch, concentrated nitric acid and cold water.

Prescriptions and Preparations.

Cerates.—Used for dressing sores and ulcers.

Simple Cerate.—Take yellow or white wax, three ounces; olive oil, two ounces; melt them on a slow fire.

Turner's Cerate.—Take simple cerate, five ounces; prepared calamine, one ounce; mix, and stir till cold.

Cerate of Zinc.—Take simple cerate, six ounces; melt, and add oxide of zinc, one ounce, and stir till cold.

Resin Cerate.—*Yellow Basilicon.* Take yellow rosin and yellow wax, of each half a pound, then add eight ounces of olive oil or lard, melt together over a slow fire, and strain through flannel cloth while hot. This is an old, but excellent, application for sores, scalds, burns, etc.

Clysters.—For colic of all kinds, take warm water of about blood heat, one stable bucket full; four ounces of common table salt, soap sufficient to make a good lather or froth; of this, three to four quarts may be injected in the rectum, every half hour, till the animal is well. For the expulsion of the fundament bots, injections of flaxseed oil are an excellent and safe method. Tobacco smoke injections are sometimes used for their removal, as well as in cases of constipation. To give injections of tobacco smoke, an instrument having both force and suction is necessary. Tobacco smoke is not recommended for either of these affections by the writer.

Drenches.—Used in cases of colic: Take sulphuric ether, half an ounce; laudanum, two ounces; flaxseed oil, one pint; mix. Or, take spirits of turpentine, one ounce; tincture of aconite root, twenty-five drops; aloes one ounce in solution; mix. Or, take warm ale, two pints; ground ginger, half an ounce; tincture of aconite root, twenty drops; mix. Used in flatu-

lent colic, accompanied with swelling of the belly: Take laudanum, two ounces; aloes in solution, one ounce; chloride of lime, half an ounce; mix. Or, take tincture of aconite root, twenty drops; aloes in solution, one ounce; sulphite of soda, one ounce; mix. Or, take spirits of hartshorn, three drachms; aloes in solution, one ounce; water, one pint; mix.

Eye Lotions and Washes.—Astringent Eye Lotion.—Take sulphate of zinc, five grains; rain-water, one ounce; mix.

Lotions for Purulent Discharges from the Eye.—Take sulphate of copper, three grains; laudanum, ten drops; rain-water, one ounce; mix.

For the Same.—Nitrate of silver, four grains; rain-water, one ounce; mix, and apply with a camel's hair pencil once in the day.

Soothing Eye-wash.—Take extract of belladonna, half a drachm; rain-water, or distilled water, six ounces; dissolve, and strain. This is to be used warm, as a fomentation to the eye.

Mild Astringent Eye-water. — Alum, four grains; rainwater, one ounce; mix.

Sedative Eye-wash.—Take sulphate of atropine, three grains; rain or distilled water, one ounce; mix, and strain. The reader of this book will remember that belladonna, or atropine, when applied to the eye, will cause the pupil of the eye to dilate.

Eye Salves.—Nitrate of Silver Ointment.—Take nitrate of silver, twelve grains; dissolve in as many drops of water; simple cerate, one ounce; mix.

Precipitate Ointment.—Take red precipitate of mercury, three grains; pure lard, two drachms; mix, and use when the eyes are red and oozing.

Freezing Mixtures.—Take sal amonniac, five parts; nitre, five parts; cold water, sixteen parts; mix. Or, take sal amonniac and nitre, of each five parts; Glauber's salts, eight parts; cold water, sixteen parts; mix. The article to be cooled should be placed in a tin vessel, which should be put in the mixture just as a butter kettle would be placed in ice water. By throwing a handful of sal ammoniac, or coarse salt or nitre, upon ice or snow, a low degree of cold will be produced, sufficient for all purposes. Freezing mixtures are of much benefit applied to sprains, when ice cannot be had.

Liniments or Embrocations.—These are external applications, and are used in the cure of sprains, bruises, chronic swellings, etc.

Liniment of Ammonia.—Take solution of ammonia, two ounces; sweet oil, six ounces; mix.

Liniment of Camphor.—Take camphor, one ounce; olive or sweet oil, three ounces; mix.

LINIMENT OF ACONITE.—Take tincture of aconite root, two ounces; olive or sweet oil, four ounces; creosote, one ounce; mix. This is one of the most valuable embrocations which can be applied to a painful bruise or sprain of whatever kind. It allays and relieves inflammation, irritation, and pain.

LINIMENT OF LEAD.—Take soap, (castile), five ounces; camphor, one drachm; Goulard's extract of lead, half an ounce; boiling water, one pint. Cut the soap into thin pieces, and the camphor in fine powder, and stir them into the Goulard's extract, then pour in the boiling water.

SOAP LINIMENT.—Opodeldoc. Take castile, or even white soap, three ounces; oil of rosemary, two drachms; oil of thyme, one drachm; camphor, one ounce; spirits of wine, one pint. The camphor is to be in fine powder, and the soap in fine shavings. The camphor, oils and soap are to be dissolved in the spirits of wine. Place the vessels holding these articles by the fire till the soap is dissolved. It should be kept in wide-mouthed bottles, of from four to six ounces' capacity.

Observe.—The oils of rosemary and thyme, entering into the mixture, are not so much for their medical virtues as for their fine smell. In horse and cattle practice, these oils can be dispensed with; or, add the same quantity of olive oil.

SOAP LINIMENT.—Common. This may be used instead of the opodeldoc. Take soap in shavings, four ounces; camphor, in powder, one ounce; spirits of wine, one pint; laudanum, half an ounce; and dissolve. This is a cheap and useful liniment for sprains and bruises.

TURPENTINE LINIMENT.—Take spirits, or oil of turpentine, two ounces; olive oil, two ounces; mix.

LIME LINIMENT.—Take equal parts of lime-water and linseed oil, and shake them well together till a white, thick, creamy, or saponaceous compound is made. This is used in cases of burns and scalds, whether in man or beast. Spread some of the liniment on a soft cotton cloth, lay it on the burned part, and when dry renew again.

CARBOLIC ACID LINIMENT.—Carbolic acid, one drachm; olive oil, eight ounces; mix. Or, water alone may be used for ordinary sores instead of the oil; but for scratches, the same quantity of glycerine will answer a better purpose.

CREOSOTE LINIMENT.—Take creosote, one ounce; oil of turpentine, one ounce; olive oil, two ounces; mix. This is a favorite liniment for sprains bruises, and sores, and gives relief from pain when rubbed upon the sprained hock-joint and stiff joints generally.

Ointments.—BLISTERING OINTMENT.—Take of Spanish fly, in powder, one drachm; hog's lard, six drachms; mix. This is the ordinary blistering

ointment. The old formula is, one of Spanish fly to four of lard. The weaker ointment answers the better purpose.

RED IODIDE OINTMENT.—Take of bin-iodide of mercury, one drachm; hog's lard, one ounce; mix. This is the most useful ointment the veterinary surgeon can employ, or possess, for the cure of splints, ring-bones, spavins, indurated or hardened tumors, and the reduction of enlargements of the glands of the neck. Iodide ointment should only be used once in five days, or till the effects of the previous application have subsided a good deal. This precaution is necessary to prevent a blemish being made by the hair falling off and not growing again, which should always be avoided.

GREEN OINTMENT.—Take of simple cerate or ointment, one ounce; add one drachm of verdigris (diacetate of copper), and mix. This ointment will heal sores when other applications have failed.

SULPHUR OINTMENT.—Take of iodide of sulphur, one drachm: hog's lard, one ounce; mix. Used in mange and skin diseases.

ZINC OINTMENT.—Take carbonate of zinc, one drachm; hog's lard, one ounce; mix. A good healing ointment.

LIVER OF SULPHUR OINTMENT.—Take of liver of sulphur, one drachm; hog's lard, one ounce; mix. Used in mange and other skin diseases. A more cleanly and easily managed form, performing all its actions, is one part of the liver of sulphur to eight parts of water.

FRENCH HOOF OINTMENT.—Take of olive oil, wax, lard, honey and white turpentine, equal parts, dissolve, or digest over a slow fire. For black hoofs, a little ivory black stirred in while hot, will give it sufficient color. For blue feet, add sufficient Prussian blue or indigo, along with the ivory-black till a blue tint is given to the ointment.

COMMON HOOF OINTMENT.—The hoof ointment sold for such, is composed of Venice turpentine wax, and suet in quantities sufficient to give consistence or thickness to the mass. Oil of tar and oil of olives, or some of the fish oils, equal parts, and sufficient lamp or ivory-black stirred in to give thickness to the whole, is probably the best ointment which can be used for the hoof of the horse.

Plasters.—Plasters are not often called for in horse and cattle diseases, but some cases arise which require a plaster over the back or loins, such as chronic sprains, lumbago, etc. Take Burgundy pitch, four parts; wax, one part; camphor, half drachm; Spanish fly, half a drachm; melt over a slow fire, spread on soft leather, and lay over the loins while warm. This will be sufficient for all purposes where a plaster is indicated. Plasters should be worn six weeks, so that the horse will reap some benefit from them.

Poultices.—CARROT POULTICE. Take of washed carrots, boil till soft,

strain off the water, and bruise the carrots into a fine pulp or mass; spread upon strong cloth. Used for sores of an unhealthy kind.

LINSEED MEAL POULTICE.—Take of boiling water one quart, stir in sufficient linseed meal with a wooden stick or spoon, and beat it well so as to have no lumps. To be spread on strong cloth or canvas, and applied.

YEAST AND CHARCOAL POULTICE.—Take yeast, one pint, and powdered charcoal sufficient to give consistence to the whole when well stirred in. This is a valuable poultice, and is not as well known as it ought to be. Used in sores discharging a stinking matter, which it soon arrests.

Spirits.—PROOF SPIRITS.—Take rectified spirits of wine, three parts by measure; water, two parts by measure; Mix. This is the proper strength for making tinctures. Keep the rectified spirits by itself till wanted, the water can be added when needed.

SPIRITS OF CAMPHOR.—Take of camphor, two and a half ounces; rectified spirits, one pint; dissolve. Used for sprains, bruises and sores.

Tinctures.—TINCTURE OF ARNICA.—Take arnica flowers, four ounces; alcohol, one quart; macerate, or steep for one week, and strain.

TINCTURE OF ACONITE ROOT.—Take of the dried and bruised root, four ounces; alcohol, half a pint; macerate for two weeks and strain. This medicine no farmer can very well do without. Those who do without it, do not know its actual value. Twenty drops of the tincture of aconite root, under certain circumstances, is as valuable as the animal which may stand in need of its great curative virtues. Measured by its power in curing diseases, its weight in gold is not its value.

COMPOUND TINCTURE OF BENZOIN.—Commonly called Friar's Balsam. Take of gum benzoin, one and a half ounces; storax, one ounce; balsam of tolu, half an ounce; aloes, in powder, two drachms; alcohol, one pint; macerate for one week, and strain or filter. Used for healing sores.

TINCTURE OF ALOES AND MYRRH.—Take aloes, in powder, one ounce; saffron, half an ounce; tincture of myrrh, half a pint; macerate for two weeks, and strain. Used for healing sores and wounds.

TINCTURE OF IODINE.—Take of iodine, half an ounce; iodide of potassium, one ounce; alcohol, one pint; macerate for a day or so, and it is fit for use. Used as an injection for abscesses and empty cavities. It is also used by some for enlargements, in the same way as it is used for erysipelas in man, by painting the affected part.

Water.—LIME-WATER.—Take a lump of lime or limestone, of about a pound weight, lay it on a soup plate and wet it with water, which will soon convert the hard stone into a fine powder. Then put it into a stone jar hold-

a gallon or upwards, fill in one gallon of water, and cork it closely. It is now ready for use when wanted. The same lime may be used repeatedly, by pouring fresh water, as the other is taken out. This water is what the lime liniment is partly composed of.

TAR-WATER.—(Bishop Berkeley's Receipt.) Pour a gallon of cold water on a quart of liquid tar; stir, mix and work them together thoroughly, with a wooden ladle, or flat stick, for five or six minutes. Then let the vessel stand, closely covered, for three days and nights. Carefully skim the surface, without moving the vessel, pour off the clear solution, and keep it in bottles well corked for use. This is a useful medicine for man and horse in chest diseases, and it would be well worthy of a trial in chronic cough in the horse.

TABLE OF DOSES ACCORDING TO AGE.

If the dose is for a full grown animal, of whatever kind, let it be one ounce.

A colt of one year will require one-third of an ounce.

A two year old will require one-half of an ounce.

A three year old will require three-fourths of an ounce.

The same proportion may be observed in cattle, from one year old and upwards. But a calf, a week or two old, will require another division of dose, still following the same rule. The dose for a one year old is one-third of the dose of adult, or full grown ox. Then the dose for a calf of four weeks will be one-twelfth of that given to a one year old, and a two months old calf or colt, will require one-sixth of that of a one year old animal. For a one week old animal, the dose will be one-fourth of that of the animal aged four weeks. The rule and the dose are merely approximate, but it is the best and only plan we can offer as a rule or guide for a posological table. Some persons have advocated a decrease in the dose for old animals. This we cannot favor, as but few horses live to be so old that a full dose of medicine would be an injury to them. The great trouble with aged horses, is not from a failure of the constitution and the general system, but from defect in the teeth, whereby, in winter, they are nearly starved, because of inability to masticate what they eat. If their food could be prepared, as is done for old men, their lives and usefulness would be prolonged; then it would be time enough to think of diminishing the dose for old horses.

TABLES OF WEIGHTS AND MEASURES

APOTHECARIES' WEIGHTS.		LIQUID MEASURES.	
20 grains	make one scruple,	60 drops	make one drachm.
3 scruples	" drachm,	8 drachms	" ounce,
8 drachms	" ounce,	20 ounces	" pint,
12 ounces	" pound.	8 pints	" gallon.

ORDINARY MODES OF MEASURING LIQUIDS.

A teaspoonful of	liquid equals	60 drops, or one fluid drachm.
A tablespoonful of	do	½ ounce, or four fluid drachms.
A desertspoonful of	do	180 drops, or three fluid drachms.
A wineglassful of	do	1½ fluid ounces.

The doses vary in quantity in different animals. The amount to be given in any case will be found clearly stated in the *treatment* of each disease, whether of horse, cattle, sheep, or hogs.

An ox's horn, cut sloping at the wide end, for drenching horses and cattle is much safer than using a glass bottle.

Index of Symptoms.

DISEASES OF HORSES.

DISEASES OF CATTLE.

DISEASES OF SHEEP.

DISEASES OF SWINE.

Veterinary Dictionary.

Abdomen—The belly, the cavity containing the heart, lungs, bowels, etc.

Abnormal—Irregular, contrary to nature, unnatural.

Abomasum—The lower or fourth stomach of all cud-chewing animals.

Abortion—The expulsion of the fœtus before its natural time.

Abrasion—Loss of a portion of skin; leaving a raw surface.

Abscess—A collection of pus in a cavity; a tumor or swelling.

Absorbents—Applied to medicines which neutralize acidity in stomach, etc.; also medicines used externally, to reduce enlargements when a blister would be too severe.

Aconite—The common name of aconitum.

Action—The paces of a horse

Actual—A term used to denote immediate effect.

Acute—A disease which has a certain degree of severity, a rapid progress, and short duration, is said to be acute.

Adamantine Substance—The enamel of the teeth.

Adherence—Sticking close to, as the skin to the ribs when an animal is hide bound.

Adipose Tissue—Fat held in the meshes of cellular tissue.

Adiposis—Hepatica. Disease of the liver, caused by an accumulation of fat. This sometimes obstructs the secretion of bile.

Adolescence—The period between puberty and that at which the body acquires its full development.

Adult Age—The age succeeding adolescence and preceding old age.

Adventitious Diseases—Those which are acquired, accidental, not inherent, casual, foreign.

Æther—A volatile liquor obtained by distillation from a mixture of alcohol and a concentrated acid.

Affiatus—Any air that strikes the body and produces disease.

Affluence—A flow, or determination of humors, and particularly of blood to a part.

Affusion—The pouring of water on a body; applied to using much water in certain fevers.

Aggregate Glands—Those which are in clusters.

Albumen—A white substance found in serum, chyle, synovia, serous fluids, etc.

Alkali, Alcali—A salifiable basis with a peculiar bitter taste, endowed with the power of changing some vegetable colors. Potash, soda and ammonia are the principal alkalis (soda).

Alcali Caustic—A pure alcali; one deprived of its carbonic acid.

Alcaloid—A name given to the organic alcalis, to distinguish them from the mineral.

Aliment—Any substance which, if introduced into the system, is capable of nourishing it and repairing its losses.

Alimentation—The act of nourishing, giving good diet, etc.

Alter—A term used synonymously with "to castrate."

Alteratives—Applied to medicines which re-establish the healthy functions of the system without any sensible evacuation.

Alum—Persulphate of ammonia and potash.

Am-au-rosis—Partial or total loss of vision from paralysis of the retina, accompanied by dilatation, but occasionally contraction of the iris, which is frequently paralyzed.

Ambulance—A conveyance in which a sick or wounded animal is carried.

Ammonia—A colorless, transparent, elastic gas; it received its name on account of being principally obtained from salammoniac. When inhaled unmixed or undiluted with common air, it instantly causes suffocation.

Amphibious Animals—That can live on land or in water.

Amputation—The operation of cutting off a limb, etc.

Anoëmia—The opposite of plethora; poverty of the blood, in which there are too few red corpuscles and too many white.

Anandria—Impotence; applied to mails that fail to beget offspring; steirlity.

Anatomy—The dissection and knowledge of the lower animals is called comparative anatomy; that of man, human anatomy.

Anbury—A soft spongy tumor, about the size of a mulberry, met with in horses and cows; also little lumps produced by insects on the roots of vegetables.

Aneurism—A tumor produced by dilation of an artery, but it has been extended to lesion of an artery as well as to dilations of the heart.

Antidote—A remedy which has the power of combating, neutralizing, or rendering poison harmless.

Anus—The extremity of the rectum, the fundament.

Aorta—The large arterial trunk arising from the left ventricle of the heart, and giving origin to every artery, except the pulmonary and its ramifications.

Aperients—Medicines which gently open the bowels.

Apoplexy—An effusion of blood, occurring suddenly, into the substance of an organ or tissue, but generally used with reference to an effusion of blood into the substance of the brain.

Aqua—Water. A name frequently applied to urine.

Arteries—Those vessels which carry the blood from the heart to the various parts of the system.

Articulations—The fastening together of the various bones of the skeleton in their natural situation; also means joints.

Asphyxia—Suspended animation; cessation, or discontinuance of breathing.

Assimilate—To change the food into a substance like the body of the animal which eats it; to convert it into nutriment, or into blood, etc.

Asthma—A disease attended with difficulty of breathing, and a sensation which produces wheezing, coughing, etc.

Atrophy—Defect of nutrition; wasting or emaciation, unaccompanied by fever. The word sweeny is frequently used to express atrophy; they are considered synonymous.

Back Galled—A swelling or sore on the horse's back, caused by careless use of the saddle or harness

Balanitis—Inflammation of the glans penis, or extremity of the yard.

Bars—The bars of the hoof are two ridges of horn, passing from the heels of the hoof toward the toe of the frog.

Bars of the Mouth—Transverse ridges on the roof of a horse's mouth; when these are swollen, the horse is said to have lampas.

Biped—Having two feet.

Bile—A yellow, greenish, viscid, bitter, nauseous fluid secreted by the liver. It is distinguished into *hepatic* and *cystic*, according as it flows immediately into the duodenum, or gall bladder.

Blood Spavin—See Spavin.

Bog Spavin—See Spavin.

Bolt—To masticate imperfectly; to swallow without chewing.

Bolus—A round or cylindrical mass; synonymous with ball.

Bone—A substance consisting chiefly of phosphate of lime and gelatine, forming the solid framework or skeleton in vertebrated animals.

Bone Spavin—See Spavin.

Botts—A species of worm often found attached to the horse's stomach.

Bowels—Intestines.

Braxy—A term applied to many fatal diseases of sheep, and especially to a form of anthrax or carbuncular fever.

Breath, Offensive—A condition of the breath, usually dependent upon decayed teeth.

Broken Wind—See Roaring.

Bronchia—The first two branches of the windpipe.

Bronchitis—Inflamation of the bronchia.

Bronchocele—An indolent swelling of the thyroid gland.

Canal—A channel for affording passage to liquids or solids, or to certain organs.

Canal, Alimentary—The canal extending from the mouth to the anus.

Cancer—A disease that generally consists of a livid tumor, intersected by firm, whitish divergent bands, and occurs chiefly in the secernent glands; the pains are acute and often extend to other parts.

Canine Teeth—The teeth between the lateral incisors and small molars of each jaw.

Cantharis—Spanish fly. It is much employed in medicine and is the most common vesicatory; given internally, and even when absorbed from the skin, it affects the urinary organs, exciting strangury.

Capped Hock—A swelling on the point of the horse's hock, occasioned by blows or kicking.

Carbonic Acid—An acid formed in the burning of charcoal, and very abundant in nature; it is often found in mines, dry wells, etc.

Caries—A disease of bones analogous to ulceration in the softer parts.

Carnivorous—That which eats flesh. Any substance which destroys excrescences in wounds, ulcers, etc.

Cartilage—A solid part of the animal body of a medium consistence between bone and ligament.

Castration—The operation of removing the testicles.

Cataract—Is an opacity of the crystalline lens or its capsule, which prevents the passage of the rays of light, and precludes vision.

Catarrh—A common cold in the head or chest; likewise the mucous fluid poured out by the bladder under disease of that organ.

Cathartics—Applied to medicines which quicken or increase evacuations from the intestines or produce purging.

Catheter—A surgical instrument like a tube, closed, but with several small perforations towards the extremity, which is introduced into the bladder through the uretha for the purpose of drawing off the urine in cases of retention, etc.

Caustic—In medicine denotes a substance which, by its chemical properties, destroys the texture of organized bodies.

Cellular Membrane—The most common of all organic tissues, constituting the network which connects the minute parts of most of the structures of the body.

Cautery—The application of a caustic substance, or of a hot iron (actual).
Centres, Nervous—The brain, spinal cord, and sympathetic ganglia.
Cerebral—Belonging or relating to the brain.
Chole—Bile.
Chorea—St. Vitus' Dance. Involuntary and irregular motions of one or more limbs, and of the face and body.
Chyle—The milk-like liquor from which the blood is formed, occupying the lacteal vessels and thoracic duct.
Chyme—The pulpy mass formed by the food in its first great change in the process of digestion.
Cicatrix—A scar; a seam; a scar or formation of reddish color, afterwards whitish, and of a variable thickness, which takes place at the surface of wounds or ulcers after their cure.
Circulation—The vital action by which the blood is sent from the heart through the arteries.
Clyster—A liquid thrown into the large intestines by means of a syringe, or bladder and pipe properly prepared, the nozzle of the syringe or pipe being introduced into the anus.
Colic—Acute pain in the abdomen, aggravated at intervals. So named from its having been supposed to have its seat in the colon.
Collapse—A state of extreme depression, or complete prostration of the vital powers.
Colon—That portion of the large intestine extending from the cæcum to the rectum.
Coma—A state of lethargic drowsiness, produced by compression of the brain and other causes.
Comatose—Having a constant propensity to sleep; full of sleep.
Conception—The impregnation of the ovum by the positive contact of the male sperm, whence results a new being.
Concocted—Brought to maturity; ripe; digested.
Concussion of the Brain—A diseased state producing alarming symptoms, caused by great violence offered to the head, though no fissure, fracture, or extravasation can be discovered.
Congestion—Accumulation of blood in an organ. It is an important symptom in febrile and other disorders. It may arise either from an extraordinary flow of blood by the arteries, or from a difficulty in the return of blood to the heart by the veins.
Constipation—A state of the bowels in which the evacuations do not take place regularly or as frequently as usual, or are inordinately hard, and expelled with difficulty.
Constitution—In medicine means the state of all the organs of the body considered in regard to their special and relative arrangement, order, and activity. A good constitution is one in which every organ is well developed and endowed with due energy.
Consumption—Any wasting away of the body.
Contagion—The communication of a disease by contact, or by inhaling the effluvia from one already affected.
Contagious—Applied to diseases which are spread by contagion.
Contraction—A property by which the particles of bodies resume their original position when the power applied to separate them is withdrawn. Also that vital property which gives to certain parts (muscles, for example) the power of contracting, by means of which the various tribes of animals perform their motions.
Contusion—Injury by an obtuse weapon, or violent collision against a hard body, without breach of the integuments; a bruise.

Convalescent—"Growing strong;" returning to full health after a disease is removed.

Corns—A diseased condition of that part of the *forward* hoof, between the bar and quarter, usually on the inside.

Corrosive—Eating away. Destroying the texture or substance of a body, more especially of a living body.

Corrugation—The contraction of the surface of a body into wrinkles.

Costa—A rib. The ribs are twenty-four in number in man; in the horse thirty-six; the spaces between them are called intercostal spaces.

Cough—A sonorous and violent expulsion of air from the lungs.

Counter-Irritation—The application of a blister or other irritating substance to one part for the purpose of relieving pain in another part, usually beneath or adjacent to the irritated surface.

Coup de soliel—Sunstroke; generally an affection produced by a scorching sun.

Cow-pox—Pustules of a peculiar character, on the teats and mamary gland of a cow, from which the vaccine fluid derives its origin.

Cramp—Spasmodic and involuntary contraction of muscles.

Cranium—The skull, or upper part of the head containing the brain and its connections.

Crepitus—The discharge of gas or flatus from the bowels.

Cribbiting, Cribbing—This causes alteration of the teeth, which are worn away on the anterior edge, their clear, smooth surface changing to more or less of yellow dentine-like substance. It is accompanied by wind sucking, which causes disorder of the digestive organs and loss of condition.

Crisis—In a disease that point or period which determines its favorable or unfavorable termination, or "its turning point."

Critical—Determining the issue of a disease; also applied to periods of life as decisive of certain changes of constitution, etc

Crop—The first stomach of a fowl. The craw.

Croup—A disease marked by laborious and suffocating breathing, with a rough noise, short, dry cough, and expectoration of a concrete membranous discharge, seldom seen in the horse.

Cryptorchid—A horse whose testicles have not descended into the scrotum.

Curb—A swelling, first soft, then hard, on the back part of the hind leg, a little below the point of the hock.

Cutaneous—Belonging to the skin.

Cuticle—The epidermis or scarf skin.

Cylindrical—Shaped like a cylinder.

Cystitis—Inflammation of the bladder.

Death—A permanent cessation of all the functions, the aggregate of which constitutes life.

Debility—Weakness or feebleness; decay of strength of body.

Decoction—The operation of boiling certain ingredients in a fluid for the purpose of extracting the parts soluble.

Deformities—Morbid alteration in the form of some part of the body. A deformity may be natural or accidental; if present at birth, it is called congenial deformation.

Dens Prolifer—A term applied to a supernumerary tooth, as wolf teeth.

Dental—That which concerns the teeth.

Dentition—The development of the teeth, of which there are two sets, the *tempovary* and *permanent*. The former are 24 in number in the horse; 12 incisors and 12 molars. The permanent are, in the horse, 40 in number, in the mare, 36, owing to the absence of the tushes or bridle teeth.

Depletion—The act of emptying the vessels, by blood-letting or the different evacuations; inordinate evacuation.

Deposit—Sediment. Anything laid or thrown down; any substance separated from the blood or other fluid, as purulent, and urinary deposits.

Depression—In anatomy, it means an excavation or hollow; in surgery, it is applied to a fracture of the cranium, in which portions of the fractured bone are forced inwards.

Determination—Strong direction to a given point, as determination of blood to the head.

Development—The organic change from the embryonic state to maturity; growth.

Diabetes—A disease characterized by great increase and manifest alteration in the secretion or urine, with excessive thirst and progressive emaciation.

Diarrhoea—A disease characterized by frequent evacuations; generally owing to inflammation of the mucous membrane of the intestines.

Diet—A particular kind of food and drink. Formerly it meant the employment of everything necessary for the preservation of life and health.

Digestion—A function by which alimentary substances, when introduced into the digestive canal, undergoe different alterations. The object of it is to convert them into two parts: the one a repratory juice, destined to renew the perpetual waste occurring in the economy; the other deprived of its nutritious properties to be rejected from the body.

Dilute—To mix fluids, or with a fluid; to weaken by addition of water.

Disease—Any deviation from health in function or structure; any state of a living body in which the natural functions of the organs are interrupted and disturbed.

Disinfectant—Applied to agents that are capable of neutralizing morbid effluvia; also to agents that are capable of removing any septic condition of the living body or any part of it.

Disorganization—A complete morbid change in the structure of an organ, or even total destruction of its texture, as in and sloughy ulcers.

Dispensary—The shop or place in which medicines are prepared.

Dissection—An operation, by which the different parts of a dead body are exposed, for the purpose of studying their arrangement and structure.

Dissector—A practical anatomist; one who prepares the parts for an anatomical lecture,

Diuretic—A medicine which has the property of increasing the secretion of urine.

Domestic—Belonging or relating to home.

Drachm—The ancient name of a piece of money, weighing the eighth part of an ounce. At the present day it is used for this weight.

Drastic, Active—A name given to purgatives which operate powerfully.

Drench—Liquid given by force through the mouth by horn, bottle, etc.

Duct—Any tube or canal by which a fluid or other substance is conducted or conveyed, especially in the internal structures of animals.

Dysentery—Inflammation of the mucous membrane of the large intestine; the chief symptoms of which are: fever more or less inflammatory, with frequent mucous or bloody evacuation; the evacuation being in part solid or lumpy, the remainder fluid.

Ear—The organ of hearing, comprehending the external, middle and internal ear.

Ebullition—The act or state of boiling.

Ecchymoma—A soft, blue swelling from a bruise; extravasation of blood into the cellular tissue.

Eczema—A smarting eruption of small pustules, generally crowded together, without fever and not contagious.

Effervescence—The agitation produced on mixing certain substances, caused by the sudden escape of gas.

Ejection—The act or process of discharging anything from the body.

Emasculation—The act of rendering impotent by injury or removal of the generative organs.

Embrocation—A fluid application for rubbing any part.

Embryo—That which grows within. The fœtus in utero, before the fifth month; also the germ of a plant.

Emetic—A medicine which causes vomiting.

Emollient—Softening or soothing an irritated surface, or one harsh from dryness.

Empyema—A collection of pus in the cavity of the chest.

Enamel—A very hard, white substance investing the crown of the teeth.

Encysted—Enclosed within a sac.

Enema—A liquid thrown into the rectum; an injection.

Engorgement—A state of vascular congestion, resulting from over-feeding, etc.

Enteritis—Inflammation of the bowels.

Entozoa—Animalcula living in the inside of an animal, as worms, bots, etc.

Epidemic—Applied to any disease which seems to affect animals generally at one time.

Epidermis—The external [illegible] of the body; the cuticle, or scarf-skin.

Epizootic—Applied to a [illegible] disease attacking numbers of horses at the same time. Epizootic may also be said to be a catarrhal fever or influenza, which, though arising from miasma peculiar to certain localities, has a tendency to spread rapidly.

Equine—Belonging to a horse.

Essence—The chief properties or virtues extracted from any substance.

Evacuation—The act of discharging the bowels; also the discharge itself.

Excision—The cutting out, or cutting off of any part.

Excitability—The capacity of organized beings to be affected by certain agents, termed stimuli, excitants, or exciting powers.

Exciting Cause—That which excites, or is the immediate cause of disease.

Excrement—The waste matter discharged from the bowels; dung.

Excrescence—Any præternatural formation on any part of the body.

Excretion—The separation of those fluids from the blood which are supposed to be useless, as urine, perspiration, etc., also any such fluid itself.

Exotic—Foreign; belonging to what is without, or beyond the limits of, our own country.

Extirpation—The complete removal or eradication of a part, by the knife.

Exudation—A sweating; the passing out of any liquid through the walls (or membranes) of the vessel containing it.

Eye—The organ of vision. The eyes occupy two cavities, called orbits, situated in the lower anterior and lateral part of the cranium; they communicate with the brain by means of the optic nerves.

Farcy—Farcy is developed from the same poison as glanders, its essence is the same, but its seat is in the skin, instead of the mucous membrane lining the nose. It is at first indicated by the appearance of hard buds on the skin, called "farcy buds," which, softening, contain a small quantity of pus. If neglected, it culminates in glanders, which is incurable.

Fat—A soft, white, animal substance; inodorous; oily; inflammable. Its function is to protect the organs, maintain their temperature, and to serve for nutrition in case of need.

Febrifuge—A medicine which drives away or abates fever.

Fester—To suppurate, or to discharge a thin fluid, proving the existence of irritation.

Fetid—Having an offensive smell.

Fever—Heat. Fever is present when there is increased heat of skin, quick pulse, languor and lassitude; an almost invariable accompaniment of all diseases.

Fibrin—A solid, white, inodorous animal principle. It is found in small proportions in the blood, increasing in inflammation, but diminishing in continued fever.

Filtration—The process of passing a liquid through a strainer, to clarify it.

Firing—See Cautery.

Fissure—A sort of fracture, in which the bone is cracked, not separated; also a chap or small cleft.

Fistula—A sinous ulcer, having an external opening frequently leading to a larger cavity, and slow to heal.

Flanks—That part of the body between the false ribs, hip, and stifle.

Flesh—That soft part of an animal particularly the muscles.

Flexor—A muscle or bendor, the office of which is to bend certain parts.

Fluctuation—The undulation of a fluid in any natural or artificial cavity, felt by pressure or percussion.

Fluid—A body, the particles of which have not sufficient cohesion to remain united when subjected to pressure.

Foetus—The immatured or unborn creature.

Fomentation—A partial bathing by the application of hot cloths saturated with hot liquid.

Fracture—A break. A fracture is termed simple, when the bone is only divided; compound, when, in addition, there is a wound of the integuments communicating with the bone; comminuted, when the bone is broken into several pieces.

Fragment—One of the two portions of a fractured bone, one being termed the superior, and the other the inferior fragment; properly speaking, a detatched portion or spicula of bone.

Friction—The action of rubbing, for exciting the action of the skin, espically hand-rubbing.

Fumigation—An operation for filling a certain space with gas or vapor, with the intention of perfuming or purifying the air.

Function—The action of an organ, or the power or faculty by the exercise of which the vital phenomena are produced.

Functional—Relating to the function of an organ.

Fundament—The anus. The aperture through which the solid portion of the excrements is expelled.

Fungus—The mushroom order of plants; hence the terms fungus is applied to the tumors formed in the substance of the textures, without any external ulceration, as warts.

Gall-bladder—A membranous reservoir containing the bile, situated on the lower surface of the right lobe of the liver. The bladder is absent in the horse.

Gall—The bile or secretion of the liver. (See Bile).

Gangrene—The state of incipient mortification. When attended with inflammation it is termed hot; when inflammation is absent it is termed cold; when the part affected contains more or less of decomposed fluids it is termed humid.

Gastric—Belonging to the stomach.

Gastric Juice—The juice secreted in the stomach by the effect of which on the food digestion is carried on.

Gastritis—Inflammation of the stomach.

Gelatinous Tissues—Tissues which render to boiling water a substance, which on cooling forms a jelly.

Generation, Organs of—The organs used in the reproduction of the species.

Gestation—The condition of pregnancy.

Gland—An organ consisting of blood vessels, absorbents, and nerves, for secreting or separating some particular fluid from the blood.

Glanders—This disease is alike fruitful of evil to man and beast. It is altogether incurable, and therefore a study of its symptoms only is necessary, in order to distinguish it from ozœna, or chronic catarrh, with which it may be confounded. When the owner has the slightest suspicion that his horse has glanders, he should without delay have his suspicions confirmed or removed by the experience of a veterinary surgeon. This disease being equally destructive of human and equine life, too much vigilance cannot be adopted.

Gleet—A thin matter issuing from an ulcer, particularly applicable to nasal gleet in the horse.

Globule—A small particle of matter of a spherical figure.

Gonorrhœa—A discharge of purulent matter from the urethra or vagina.

Gravel—Calculous matter formed in the kidneys, passing off in the urine.

Haunch—The region formed by the lateral parts of the pelvis and the hip-joint.

Heart—The hollow, muscular viscus situated between the lungs and enclosed in the pericardium.

Hectic—Relating to the constitution or habit.

Hectic Fever—A slow, insidious fever.

Hepar—The liver.

Hereditary—Derived from the parent.

Hermaphrodite—One having the organs of generation too nearly resembling those of the opposite sex, or possessing the attributes of both sexes.

Hernia—Rupture. A tumor formed by the protusion of any of the viscera of the abdomen beyond its parietes.

Hide-bound—A term used to denote the adherence of the horse's skin to the ribs, when the animal is diseased, in contradistinction to its looseness and suppleness when in a state of health. It usually arises from a deficiency in the quality or quantity of food, and is commonly an attendant on lingering diseases.

Hidrotic—Causing sweat.

Hippus—An affection of the eyelids, in which there is a constant tendency to wink.

Humerus—The shoulder. The junction of the scapula and humerus.

Hybrid—The offspring of two different species of animals.

Hydrophobia—A disease so called because dread of water is one of its symptoms. It is caused by the bite of a rabid dog or other animal

Hypodermic—A term for the application of medicines under the skin.

Hypoglottis—The inferior part of the tongue adhering to the lower jaw.

Impregnation—The act of making pregnant, or the state of being pregnant.

Inanition—Emptiness of the body from want of food.

Incineration—The act of reducing animal or vegetable matter to ashes.

Indigestion—A state of the system in which the food is not properly assimilated.

Induration—The hardening of any part from the effect of disease.

Infection—The communication of a disease by personal contact with the sick, or by means of effluvia arising from the body of the sick.

Inflammation—A morbid process or alteration in a part in which there is perversion of nerve action. This process is ordinarily attended by pain, redness, heat, and swelling, and more or less disturbance of the general system.

Inflexed—Curved inwards.

Influenza—So called because the disease seems to reside in, or depend upon, some atmospheric influence. An epidemic disease characterized by the suddenness of its attack, general depression, heaviness of the eyes, and by a distressing fever.

Inhalation—Drawing of the air into the lungs. Usually applied to the breathing of medicated or poisonous fumes.

Infusion—The act of steeping some substance in water.

Injection—Any medicated liquor thrown into a natural or preternatural cavity, by means of a syringe; when intended for the rectum, it is termed a clyster.

Inoculation—The insertion of virus into any part of the body in order to communicate a disease.

Insomnia—Want of sleep.

Inspiration—The act of drawing in the breath.

Instinct—The power by which animals, independently of experience or instruction, do what is necessary for the preservation of the individual or race.

Integument—The cuticle, rete mucosum, cutis, and andipose tissue, together forming the covering of every part of the body, except the nails or hoofs.

Intermission—A temporary cessation. Applied to fevers, etc.

Intermittent Fever—A fever in which the paroxysm intermits and runs at nearly regular intervals.

Intestines—The long, membranous tube continuing from the stomach to the anus in the cavity of the abdomen.

Iris—A delicate, circular membrane of the eye, floating in the aqueous humor suspended vertically behind the cornea, and perforated to form the pupil.

Irrigation—The continual application of a lotion by dropping water on the affected part.

Irritation—The excessive action of any stimulus producing an increase in the sensibility.

Isolated—Separated from surrounding bodies.

Issue—A small sore produced by art and kept open to relieve irritation or morbid action in a neighboring part.

Jaundice—A disease characterized by yellowness of the eyes, skin and urine, and by general languor and lassitude.

Jaw-bone—The bone of the jaw containing the teeth.

Joint—The joining of two or more bones; an articulation, as the knee.

Jugal Region—The region of the cheek-bone.

Jugular—Relating to the throat.

Kidney—The kidneys are two glandular bodies, situated in the lumbar region, consisting of an external, and an internal or tubular substance. The office is to secrete the urine, and thus to carry off the superfluous fluid from the system.

Kidney Horse-shoe—A fatty conformation, in which the lower ends of the two kidneys are united by a transverse portion across the spine, thus forming a crescent or horse-shoe.

Knot, Surgeon's—A double knot, made by passing the thread twice through the same noose.

Lachrymal—Belonging to the tears.

Lachrymal Canal—A duct extending from the lachrymal sac and opening into the inferior meatus of the nose.

Lamina—A thin, flat part of a bone, as the plate of the ethmoid bone.

Laminitis—This disease consists of inflammation of the parts between the pedal or coffin, bone, and the sensitive laminæ, whence the name. It is also called Founder.

Languor—A species of depression, or debility which generally comes on slowly.

Laryngitis—Inflammation of the larynx.

Latent—An epithet applied to certain diseases or states of disease, in which the symptoms are so concealed as to escape the observation of the physician, as latent inflammation.

Lax—Diarrhœa.

Laxative—A medicine which gently opens the bowels.

Leap—Muscular movement, by which the body is detached from the soil by the forcible and sudden extension of the limbs.

Lethargy—A constant state of stupor, from which it is difficult to arouse the animal.

Ligaments—Fibrous structures, uniting the bones, and forming articulations; hence the division into interosseous and articular.

Ligature—A thread of silk, flax, or other suitable material, for tying arteries or other parts. The bandage used for phlebotomy.

Liniment—An unctuous medicine, containing usually oil or lard, employed externally by means of friction.

Lip—The lips are composed of different muscular nerves, and vessels, covered by the skin and mucous membrane of the mouth.

Liquefaction—Transformation of a solid substance into a liquid.

Liver—The largest gland in the body. Its office is to secrete the bile. It is situated on the right side of the abdominal cavity. By its clifts or fissures the liver is divided into what are called its lobes, of which division there is a great variety in the differens species of quadrupeds. In the horse this gland is constituted of two principal lobes, right and left, united by a middle portion, and two lobuli or small lobes.

Lobe—A round, projecting part of an organ.

Local—Confined to a part, without implicating the general system.

Lock-jaw—(See TETANUS.)

Longevity—The prolongation of existence to an advanced age.

Lotion—A fluid for external application. Lotions are ordinarily applied by wetting a linen in them, and keeping it on the part affected.

Lumbago—Rheumatism affecting the lumbar muscles.

Lungs—The organs of respiration, occupying the thorax or chest.

Lymphatic—Applied to vessels conveying lymph.

Maceration—The process of steeping a substance in water, to extract its virtues.

Malaria—Infectuous effluvia from decayed animal or vegetable matter.

Malignant—Applied to diseases that endanger life, more especially to those that are characterized by their violence.

Mammal—Having breasts or teats.

Mange—A contagious disease of the skin, arising from poverty and neglect, and is caused by the presence of acari or parasites.

Marrow—The fatty, oleaginous substance in the cavities of long, cylindrical bones.

Mastication—The act or process of chewing.

Maximum—The greatest possible quantity or effect.

Membrane—A skin-like tissue composed of interwoven fibres used to cover some part of the body, and sometimes forming a secreting surface.

Meningitis—Inflammation of the membranes of the brain.

Miasm, Miasma—Floating, impalpable disease, causing effluvia; the product of decay or putrefaction of animal or vegetable substances.

Milk Fever—A fever accompanying or preceding the secretion of milk soon after delivery.

Morbid—Diseased, or pertaining to disease.

Mortification—The loss of vitality in or death of a part.

Motor—A mover. Applied to muscles, etc.

Motory—Causing motion. Applied to nerves which convey the stimulus which excites motion to the muscles.

Mucilaginous—Belonging to mucilage or to gum; gummy,

Muscular Fibre—The fibres composing the body of a muscle, disposed in distinct bundles.

Muscular—Relating to or abounding in muscle.
Myalgia—Pain in the muscles.
Narcotic—Applied to a medicine that produces sleep or stupor.
Nasal—Belonging to the nose.
Nausea—Sickness of the stomach.
Navel—The umbilicus; the centre of the lower part of the abdomen.
Navicular Disease—Also called navicular joint disease and naviculartritis, is an affection of the inferior part of the small sesamoid bone, the synovial membranes, and the ligaments, and the tendon, which glides over it.
Nephritis—Inflammation of the kidney.
Nerve—A medullary cord, originating from the brain or spinal marrow, by which sensation is conveyed.
Neuralgia—Pain in a nerve.
Neuritis—Inflammation of a nerve.
Nutrition—The assimilation or indentification of nutritive matter to the organs of the body.
Obesity—Fatness of the body generally.
Obliteration—The alteration in the appearance or function of a part, so that it no longer serves its original purpose.
Obstipation—Obstinate costiveness, there being no relief by evacuation.
Occult—Hidden, as applied to diseases, the causes and treatment of which are not understood.
Ocular—Belonging to the eye.
Olfactory—Belonging to the organ or sense of smell.
Operation—The performance of any of the more important acts of surgery.
Ophthalmia—Inflammation of the eye. There are several varieties, the principal of which are catarrhal and recurrent ophthalmia, arising from atmospheric and constitutional causes.
Oppression—A sensation of weight on a part.
Optic Nerve—The nerve forming the communication between the brain and the organ of vision.
Organ—A part of an animal capable of performing some act appropriate to itself.
Orifice—A mouth or entrance to any cavity of the body.
Origin—Commencement, as the origin of a muscle, the attachment to the part it moves being called its insertion.
Osteitis—Inflammation of the substance of a bone.
Oval—Egg-shaped.
Ovis—A sheep.
Palpitation—Convulsive motion of a part. Applied especially to the rapid motion of the heart.
Paralysis—A disease in which the power of voluntary motion of a part is lost or diminished.
Parotid Gland—The largest of the salivary glands, seated under the ear, and near the angle of the lower jaw.
Paroxysm—An evident increase of symptoms; a periodical fit or attack.
Pathology—That branch of medical science which treats of diseases, their nature and effects.
Paunch—The stomach. Applied especially to the first and greatest stomach of the ruminantia.
Pelvis—That part of the trunk bounding the abdomen, supporting and containing a part of the intestines and the urinary and genital organs.

Penis—The chief organ of generation in the male.

Pericardium—The membranous bag which contains the heart.

Periosteum—The thin membrane forming the immediate covering of the bones.

Perspiration—The fluid secreted by the extremities of the cutaneous arteries on the surface of the body; sweat.

Pestilence—A contagious or infectious disease which is epidemic or endemic.

Phlegm—The thick, viscid mucus secreted by the lungs.

Piles—A disease of the veins at the extremity of the rectum, around the anus, assuming a knotted or clustered condition.

Pneumonia—Inflammation of the lungs; the symptoms being fever, pain in the thorax, aggravated by coughing, quick and wiry pulse, and difficult of breathing, and congestion of the visible mucous membranes.

Poison—An animal, vegetable, or mineral substance, which, when applied externally, or taken into the stomach or circulatory system, causes such a change in the animal economy as to produce death. They are classified as irritant, narcotic, sedative, acro-narcotic, and acro-sedative.

Poll Evil—A disease occurring on the summit of the head from pressure or a blow, either of which, if continued or repeated, causes inflammation, frequently resulting in suppuration and the production of abscesses round the attachments of the cervical ligaments.

Polypus—A tumor having numerous ramifications, situated in the nose, uterus or vagina.

Post-mortem—After death. Applied to the examination of a dead body.

Predisposition—Any state of the system which disposes to the action of disease.

Proud Flesh—Fungus; a redundant growth of flesh on an ulcer, or excessive granulation.

Pulsation—Any throbbing sensation, resembling the beating of the pulse, as the pulsation of the heart, etc.

Pulse—The beating of the arteries following the action of the heart during contraction.

Purgation—A purging or evacuation of the bowels.

Pus—A cream-like fluid found in abscesses, or on the surface of sores; matter.

Putrification—The spontaneous decomposition of animal or vegetable matter; rottenness.

Quittor—A chronic abscess in the hoof, caused by a bruise or prick of the sole, by inflammation arising from neglected thrush, or from the calk of one foot being pressed into the coronet of the other. Suppuration sets in, and from a difficulty in discharging pus, a fistula is formed.

Rabies—A disease caused by the empoisoned saliva of dogs and some other animals being absorbed into the system through a wound, bite or scratch. In this disease the very sight of water, or other liquid, usually causes a spasm of the throat, accompanied by a sense of suffocation, and an indescribable horror, whence the name *hydrophobia*, by which it is commonly known.

Rash—An eruption of the skin, such as nettle-rash, etc.

Reaction—The "acting again" of the vital powers after they have been greatly depressed.

Refrigerant—Applied to medicines which cool the body or blood.

Remittent—Applied to disorders the symptoms of which abate considerably and then return again and again until the disease is overcome or proves fatal.

Resolvent—Applied to substances that scatter inflammatory or other tumors.

Respiration—The function of breathing, including both inspiration and expiration.

Respiratory Murmur—The murmuring sound heard from the lungs of a healthy animal, produced by the penetration of the air into the pulmonary tissue and its expulsion from it.

Retention—The stoppage or keeping back of any of the excretions, especially the urine.

Retina—The organ of visual perception, the most internal membrane of the eye, being an expansion of the optic nerve.

Rigidity—Stiffness; inflexibility.

Ringbone—Ringbone consists of exostosis, or the excrescence of bony matter on the coronet bone, and the pastern bone. They are of three kinds, superior or false, median, and inferior.

Roaring—The disease termed by all English authors "broken wind" is in Canada called *heaves*, and the disease recognized here as broken wind is named roaring in England. Using these terms, as generally understood here, heaves is due to rupture and enlargement of the air cells of the lungs; broken wind, in a large majority, if not in all, cases is caused by constriction or deformity of the wind pipe. Broken wind and roaring are incurable diseases, and can be only partially relieved by attention to the animal's diet.

Rumination—Chewing the cud, or bringing up of the food previously swallowed into the mouth again to be properly masticated.

Rupture—A popular name for Hernia, which see.

Saccharine—Containing sugar.

Saliva or Spittle—An inodorous, insipid, transparent fluid; secreted by the various glands, and poured into the mouth by several ducts. It assists in the process of digestion.

Salutary—That which is favorable to health.

Sanguine—Abounding with blood.

Sanitary—That which relates to health.

Satiety—Disgust for food; commonly produced by repletion.

Saturate—To soak; to impregnate or unite with till no more can be received.

Scab—An incrustation which forms upon a sore, owing to the concretion of the fluid discharged from it.

Secretion—A function by which various fluid or substances are separated from the blood; thus the kidneys secrete the urine, the liver, the bile, the salivary glands, the saliva.

Sedatives—Medicines which diminish vital action, usually classed as arterial and nervous.

Semen—The seminal liquor secreted in the testicles of animals.

Sensation—The consciousness of an impression made by an external body on the organs of sense.

Sinew—A fibrous cord connecting a muscle with a bone; a tendon.

Skeleton—The dried bones of an animal prepared for anatomical purposes.

Skin—The organ of touch; one of the mediums through which we communicate with external bodies.

Spavin—Spavins are of two kinds, bone spavin, and bog or blood spavin. Its seat is in the capsule, between the tibia and astragulus,

Specific—Applied to a medicine supposed to cure infallibly a certain species of disease; or to a remedy which has a special action on some particular organ.

Spinal Marrow—The substance contained in the vertebral column; the spinal chord.

Spine—A process or projection of bone, and hence applied to the backbone.

Spiral—Winding like the worm of a screw.

Splint—Is an osseous deposit between the large metacarpal, or cannon, or shank bone, and the two small metacarpal bones, caused by inflammation of the ligaments, or of the membranous covering of the bones, or of the bones themselves.

Sprain—The sudden shifting of a joint further than the natural conformation of bones and ligaments allows, yet not so as to produce dislocation.

Staggers—A disease of horses resulting from some brain trouble and implying a loss or control of voluntary motion and want of sensation. Horses liable to this disease should never be overfed.

Sterile—Barren.

Strangles—An eruptive fever of young horses, attended with inflammation of the submaxillary and parotid glands, followed by suppuration of the local connecting tissue.

Strangulation—Choking. Constriction of a part from contraction of muscular fibre, etc.

Strangury—A difficulty in passing water, which is discharged only by drops, causing great pain.

Stricture—A contraction in a canal, tube, or duct; as in the œsophagus, urethra, etc.

Sympathy—The connection that exists between the action of two or more organs more or less distant from each other, so that the affection of the first is transmitted secondarily to the others, or to one of the others, by means unknown.

Synovia—The unctuous fluid secretion of certain glands in the joints, with which the surfaces of the articulating heads of bones are lubricated, and their motions facilitated.

Syringe—An instrument for injecting liquids into any vessel or cavity.

Tendon—A fibrous, white chord, generally rounded, by which a muscle is attached to a bone.

Tetanus—A disease in which the muscles of voluntary motion are spasmodically contracted, causing rigidity of the parts affected.

Thoroughpin—A bursal enlargement of the upper and back part of the hock.

Thrush—An offensive discharge from the cleft of the frog, accompanied by decomposition of the horny substance.

Tonics—Medicines which produce a permanent, but scarcely perceptible, excitement of all the vital functions; thus differing alike from stimulants, which immediately and sensibly *excite*, as well as from sedatives, which *depress*.

Trachea—The windpipe.

Transformation—A change of substance or form, as of the soft parts into bone or cartilage.

Transfusion—The introduction of blood from the veins of one living animal into those of another.

Trichina—A species of minute entozoon found in the muscles, sometimes causing the death of an animal in which it is found.

Tubercle—A small swelling in the substance of an organ.

Tumefaction—An enlargement or swelling from any cause.

Ulcer—A dangerous, running sore.

Ureter—The membranous tube through which the urine is conveyed from the kidney to the urinary bladder.

Urine—The saline secretion of the kidneys which flows from them through the ureters into the urinary bladder.

Uterus—The hollow, muscular organ designed for the lodgment and nourishment of the fœtus from the moment of conception till birth.

Vaccina—A disease originating in the cow, with which, if the human body be inoculated, it is preserved from the contagion of smallpox.

Varicose—Applied to veins permanently dilated, containing dark-colored blood whose circulation is retarded. These veins are knotty and irregular.

Vermifuge—Having power to expel worms.

Vertebra—One of the bones constituting the vertebral column, or backbone.

Vertigo—Dizziness.

Veterinary Medicine—The healing art as applied to diseases of horses, cattle, etc.
Virus—Poison. Applied to any matter produced by disease, and capable of propagating that disease by inoculation or contagion.
Vision—Sight; the faculty of seeing.
Voracious—Devouring; ravenous; extremely hungry.
Voracity—Greediness for food.
Wheezing—A noisy respiration.
Windgalls—A distension of the synovial membranes of the fetlock joints caused by over-exertion or sprains.
Withers (*Fistulous*)—See POLL EVIL, to which it is similar in every respect, except location.
Worms—Animals which infest the intestines.
Wound—A breach of the skin and flesh of an animal, caused by external violence.
Wry Neck—A fixed, involuntary inclination of the head towards one of the soulders.

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