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EXPLANATION.

The white lines at *b*, *e*, and similar ones shown in the legs and other parts of the anatomy, represent the veins—*d*, *e* *f* some of the most prominent muscles. See page 14.

The other parts are explained under their respective heads in the body of the work. A correct knowledge of them will greatly assist the operative Farrier.

THE AMERICAN FARRIER;

CONTAINING

A MINUTE ACCOUNT OF THE FORMATION OF EVERY PART OF
THE HORSE,

FROM THE EXTREMITY OF THE HEAD TO THE HOOF.

WITH A DESCRIPTION OF ALL THE DISEASES TO WHICH EACH PART IS LIABLE; THE
BEST REMEDIES TO BE APPLIED IN EFFECTING A CURE; AND THE MOST
APPROVED MODE OF TREATMENT FOR PREVENTING DISORDERS:

Accompanied with

A COPIOUS ALPHABETICAL LIST OF MEDICINES,

DESCRIBING THEIR QUALITIES AND EFFECTS WHEN APPLIED IN DIFFERENT CASES; AND
A COMPLETE TREATISE ON REARING AND MANAGING THE HORSE FROM THE
FOAL TO THE FULL GROWN ACTIVE LABORER.

Compiled chiefly from the celebrated "Library of Useful Knowledge," just published by a committee of one hundred and fifty eminent Agriculturists, who have used every means in their power, in investigating this useful branch of agriculture. The "American Farrier" contains the result of their experiments and researches, with many additions, adapting the whole to the present state of Farriery in the United States.

ILLUSTRATED BY ENGRAVINGS, AND ARRANGED ON A NEW PLAN.

BY H. L. BARNUM.

Editor of the "Farmer's Reporter."

PHILADELPHIA:

URIAH HUNT, NO. 101 MARKET STREET;

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1832.

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Eastern District of Pennsylvania

INTRODUCTION.

IN addition to the information already known relating to the Horse, it is believed this work contains many important facts, the knowledge of which, will prove permanently beneficial in his proper care and treatment, both under disease and in health.

"Many diffuse and elaborate works on this subject have been published at different periods; some of them, indeed, containing, amidst the massive bulkiness of their forms, a considerable portion of matter of lasting utility; but the greater part of them, tending rather to puzzle the reader by multiplying useless words and medicines, or by enumerating diseases that exist no where but in the imagination of authors, than to bring the practice of physic, with respect to horses, into so narrow a compass as to save the readers much time and trouble, which, in this *concentrating* and *time-pressing* age, is a matter of no small consideration."

This work is compiled chiefly from the celebrated "*Library of Useful Knowledge*," conducted by an association of one hundred and fifty of the most eminent agriculturists in Europe. Such diseases as are common here, and do not exist in that country, are described in this treatise. The mechanical arrangement is such, that the reader can turn to any given topic upon which he may require information, and find all the particulars relating to it under one head, in connexion. Thus, when a disease is described, the construction of the part affected is explained, and the remedy for the sickness given.

This arrangement of matter so *valuable*, will furnish one of the most perfect systems of Farriery extant. "It is the reducing knowledge into systems, and deducing effect from causes, which advances learning and information on all subjects, and produces the most valuable works."

The Table of Contents at the commencement, shows the arrangement of matter under each division, or chapter; and the Index at the end of the volume, affords a convenient reference to any article in the Treatise, being alphabetically arranged.

The marginal references point out the contents of the paragraphs to which they are affixed.

More than one hundred different kinds of medicine (such as farmers can easily procure,) are described, giving their qualities, and the effects produced when applied in different cases. This information, exclusive of the other matter, is considered by competent judges, worth more than the price of the whole work.

VOCABULARY.

The principal part of the "*hard words*" used in this treatise are defined where they are inserted; a few, however, require an explanation here, to render them intelligible to every reader. (See page 13.)

ABRASION—The act of wearing or rubbing off.

APERIENT—A medicine which promotes the circulation of the fluids.

Box—Stall, or place of confinement.

BARNACLES—A. instrument to put on the nose of a horse to confine him.

BOLUS—A soft mass of any thing medicinal.

CUTICLE—Skin.

CATAPLASM—Poultice.

CHYME—The modification which food assumes after it has undergone the action of the stomach.

CELLULAR—Consisting of cells.

CHAFF—Cut Straw.

DIURETIC—Having the power to discharge urine.

EXCITANTS—Stimulant, or that which produces increased action.

EMBROCATION—The act of moistening.

EXCORIATION—Wearing off the skin.

FLAP—This word is sometimes used instead of trap-door.

FUNGUS—Spungy excrescence, or "proud flesh."

GROOM—A man who has the charge of horses.

IRIS—The coloured circle around the pupil of the eye.

ILEUM—Insertion of one part of an intestine into another.

LEVIGATED—Ground or made fine.

LUBRICATE—To make smooth.

LIGATURE—Bandage.

MEAT—This when used in farriery means grass or fodder.

MASH—See list of medicines.

MACERATED—Made lean.

MUCOUS—Slimy.

PUS—The matter collected in ulcerated sores.

PURULENT—Consisting of pus.

PLEDGET—A small bunch of tow or lint.

PREPUCE—The fore skin.

ROLLER—Bandage.

RUG—Blanket.

SALIVA—Liquid of the mouth. (See page 57.)

TONIC—A medicine that gives vigour and action to the system.

TUMEFIED—Swelled.

UNGUENT—Ointment.

VOIDING—Throwing off.

VISCID—Sticky, Glutinous.

VETERINARY SURGEON—This appellation is sometimes given to the farrier or horse-doctor.

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EXPLANATION OF THE PLATE.

Terms used to denote the external parts.

Fig. 1. Muzzle.	14. Ham string.	28. Heel.
2. Race.	15. Point of the	29. Hoof of the fore
3. Forehead and	Hock.	leg.
Feather.	16. Cannon.	30. Sm. Pastern do.
4. Poll.	17. Fetlock.	31. Large Pastern
5. Crest.	18. Large Pastern.	32. Fetlock.
6. Withers.	19. Small Pastern.	33. Cannon.
7. Back.	20. Hoof.	34. Knee.
8. Loins.	21. Coronet.	35. Arm.
9. Hip.	22. Ham or Hock.	36. Breast.
10. Croup.	23. Stifles.	37. Point of the
11. Dock.	24. Sheath.	shoulder.
12. Quarter.	25. Abdomen.	38. Windpipe.
13. Thigh or Gas-	26. Girth.	39. Gullet.
kin.	27. Elbow.	40. Jawl.

BEAUTIFUL as is the horse, and identified so much with our pleasure and our profit, he has been the object of almost universal regard; and there are few persons who do not pretend to be somewhat competent judges of his form, qualities, and worth. From the nobleman with his numerous and valuable stud, to the meanest helper in the stable, and not excluding even the mechanic who scarcely crosses, or sits behind a horse once in a twelvemonth, there is scarcely a man who would not be offended if he were thought altogether ignorant of horse-flesh. There is no subject on which he is so positive, there is no subject on which, generally speaking, he is so deficient, and there are few horses, on some points of which these pretended and self-sufficient judges would not give a totally opposite opinion.

The truth is, that this supposed knowledge is rarely founded on principle—or is the result of the slightest acquaintance with the actual structure of this animal, or that form and connexion of parts on which strength, or fleetness, or stoutness, must necessarily depend.

In speaking of the structure of this animal, and the points which guide the opinion of real judges of him, we shall, as briefly and as simply as we are able, explain those fundamental principles on which his usefulness and beauty must depend. We require one kind of horse for slow and heavy draught, and another for lighter and quicker work, one as a pleasant and safe roadster; and another is wanted for the race-course. What is the peculiarity of structure—what are the particular points that will fit each for his proper business, and, to a certain degree, unfit him for everything else? The farmer will require a horse of *all work*, that can carry him to market and take him round his farm, on which he can occasionally ride for pleasure, and which he

must sometimes degrade to the dung-cart or the harrow. What combination of powers will enable the animal to discharge most of these duties well, and all of them to a certain extent profitably?

Much time spent among horses, an acquired love of them, and a little, sometimes possibly, too dearly-bought experience, may give the agriculturist some insight into these matters. We will try whether we cannot assist him in this affair; whether we cannot explain to him the reason why certain points must be good, and why a horse without them must, of necessity, be good for nothing. Perhaps some useful rules may thus be more deeply impressed upon his memory, or some common, but dangerous prejudices may be discarded, and a considerable degree of error, disappointment, and expense avoided.

It is first of all necessary to give the Skeleton of the Horse, in which we shall endeavour to elucidate those numerous and beautiful instances of wise and benevolent design, exhibited in the structure of this valuable animal, and which will render our study of him more interesting; while many a hint of practical utility will be gained.

If we treat of this at considerable length, let it be remembered, that the horse is our noblest servant, and that, in describing the structure and economy of his frame, we are, in a great measure, describing that of other domestic quadrupeds. And further, let it be remembered that it is only by being well acquainted with the structure of the horse that we can appreciate his shape and uses, or understand the different diseases to which he is liable. We trust the reader who may fancy us rather prolix on this head will, before the work is finished, feel the full value of what we purpose to explain. It is from want of knowledge of the structure of the horse, that much of the mass of ignorance and prejudice which exists, as to the diseases, &c. to which the horse is subject, is to be referred; and we deem it one of the most important objects of this treatise to reform this ignorance, and remove these prejudices.

SKELETON OF THE HORSE.

Explanation of the Cut.

- A The head.
 a The posterior maxillary, or under jaw.
 b The superior maxillary, or upper jaw. Opposite to the letter is a foramen through which pass the nerves and blood vessels which chiefly supply the lower part of the face.
 c The orbit, or cavity containing the eye.
 d The nasal bones, or bones of the nose.
 e The suture dividing the parietal bones below, from the occipital bones above.
 f The inferior maxillary bone containing the upper incisor teeth.
 B The Seven Cervical Vertebrae, or bones of the neck.
 C The Eighteen Dorsal Vertebrae, or bones of the back.
 D The Six Lumbar Vertebrae, or bones of the loins.
 E The Five Sacral Vertebrae, or bones of the haunch.

- F The Caudal Vertebrae, or bones of the tail, generally about fifteen.
 G The Scapula, or shoulderblade.
 H The Sternum, or fore-part of the chest.
 I The Costae, or ribs, seven or eight articulating with the sternum, and called the *true ribs*, and ten or eleven united together by cartilage, called the *false ribs*.
 J The Humerus, or bone of the arm.
 K The Radius, or bone of the fore-arm.
 L The Ulna, or elbow. The point of the elbow is called the Olecranon.
 M The Carpus, or knee, consisting of seven bones.
 N The metacarpal bones. The larger metacarpal, or cannon, or shank in front, and the smaller metacarpal, or splint bone behind.
 g The fore pastern and foot, consisting of the Os Suffraginis, or the upper and larger pastern bone, with the sesamoid bones behind, articulating with the cannon and greater pastern; the Os Coronæ, or lesser pastern; the Os Pedis, or coffin-bone; and the Os Naviculare, or navicular, or shuttle-bone, not seen, and articulating with the smaller pastern and coffin bones.
 h The corresponding bones of the hind-feet.
 O The Haunch, consisting of three portions, the Ilium, the Ischium, and the Pubis.
 P The Femur, or thigh.
 Q The stifle joint with the Patella.
 R The Tibia, or proper leg bone—behind is a small bone called the fibula.
 S The Tarsus, or hock, composed of six bones. The prominent part is the Os Calcis, or point of the hock.
 T The Metatarsals of the hind leg.

It will be proper here, once for all, to caution the reader, who has hitherto been unaccustomed to reading books of science, against being deterred by the sight of a few of what are termed *hard names*. The fact is, that science must have, to a certain extent, a new language to express minutely and accurately the particular parts or things to be described; and this is the case with every trade, and every art. A carpenter could not without this describe with precision and clearness the different tools in use, nor could he describe the different operations to be performed, without inventing a particular language adapted to his purpose, and whereby he is enabled to express in one word what would otherwise only be accomplished by a long sentence. It is the same with anatomy, except that the names and signs have principally been adopted from the *Latin* and *Greek*, inasmuch as those languages are usually known to scientific men in all countries. This new language becomes one common to all men pursuing the same science. We shall as we go on explain the meaning of the words so adopted, and a very little attention will enable the reader to master them, and

it will require little thought to be convinced of the advantage, in respect of clearness and certainty, derived from their use.

DEFINITION OF ANATOMICAL TERMS.

We here give a short description of the most prominent and most important parts exhibited in the anatomy of the horse. They are explained more fully under their respective divisions, in the body of this work.

The common integuments may be considered as the hair, the cuticle (skin), the cellular membranes, which contain fat and other fluids, and the *panniculus carnosus* or fleshy panicle; to these may be added, the *unquies*, nails or hoofs.

The Muscles are the organs of motion, consisting of fibres or bundles of fibres enclosed in a thin cellular membrane. They are distinctly marked in the *shoulder*, and the *quarter* of the anatomy. The tree-like fibres there exhibited, as well as in other parts, are the veins, which are described on the following page in their order. A close examination of these will afford great assistance to the practitioner in bleeding.

Ligament is a strong, compact substance, which serves to bind one bone to another.

Tendons are hard, insensible cords, by which the muscles are attached to the bones.

Glands may be considered as secretory bodies, composed of all the different vessels inclosed in a membrane; their office appears to be to secrete or form some fluid, as the liver secretes bile, and the kidney urine.

The appendages to bone are cartilage or gristle, *periosteum*, *medulla* or marrow, ligaments and synovia, or joint oil.

Absorbents are vessels which imbibe; as the lacteals, lymphatics, and inhaling arteries.

Lacteals and *Lymphatics* are slender tubes which convey the chyle (milky fluid) from the intestines to the common reservoir.

The nervous system of the horse is composed of white medullary (marrow-like) cords, springing from the brain and spinal marrow, whence they are generally distinguished into the cerebral and spinal nerves.

The cerebral or cerebriine nerves, arise in pairs immediately from the brain.

The spinal nerves are those which arise immediately from the spinal marrow. The internal structure of these bodies is fibrous, and their ramifications extend to every part of the body; it is supposed that the brain is the seat of sensation, and that the nerves are only the messengers of it.

The arteries are long membranous canals or conductors of the blood, composed of three strata, which are called *tunicae* or coats as an external, elastic, a middle muscular, and an internal cuticular. Each of these coats is the cause of some important phenomena, as well in disease as in health. The elastic power enables them to admit a larger quantity of blood at one time than another, and thus they are turgid under inflammation: by this also they can adapt themselves to a

smaller quantity than usual; otherwise a small hæmorrhage would prove fatal. The muscular tunic appears to exist in much greater proportion in the horse than in man, and this accounts for his greater tendency to inflammation, and also why inflammatory affections run to their terminations so much sooner in the horse than in man. The arteries gradually decrease in their diameter as they proceed from the heart.

The veins are vessels which return the blood of the body that has been distributed to it. They have less solidity, and possess two tunics or coats. They usually accompany the arteries in their course, but are more numerous, being wisely divided into a superficial and a deep seated set, to avoid the dangerous effects of interruption.

To prevent the return of the blood they are furnished with valves.

We begin with the head, containing the brain and the most important organs of sense.

The head may be divided into two parts, the skull and the face.

The bones which compose the skull or *cranium*, and which contain and protect the brain are nine in number; two frontal,—two parietal,—two temporal,—the occipital,—the ethmoid, and the sphenoid. The two latter lie principally at the base of the skull. These nine bones are separate in the foal at an early period of its existence; but soon after the birth they are firmly united together by what anatomists call sutures, and so firm is the union, that a fracture will occur in any other part more readily than over a suture.

There is an evident intention in this division of the head into so many bones. When the foetus—the unborn foal—first begins to have life, that which afterwards become bone, is a mere jelly-like substance; this is gradually changed into a harder material—cartilage; and, before the birth of the animal, much of the cartilage is taken away by vessels called absorbents, and bone deposited in its stead. In flat bones, like those of the head, this deposit takes place in the centre, and rays or radiations of bone extend thence in every direction. Then, by having so many bones, there are so many centres of radiation; and, consequently, the formation of bone is carried on so much the more rapidly, and perfected at the time when the necessities of the animal require it. At the period of birth, however, this process is not completed, but the edges of the bones remain somewhat soft and pliant, and therefore, in parturition, they yield a little and overlap each other, and thus, by rendering the birth more easy, they save the mother much pain, and contribute to the safety of the foal. Without a change in the form of the head, from a compression and yielding of the bone of which it is composed, the animal could not be born.

The first of these bones, or the first pair of them, occupying the broad expanse of the forehead, are called the *frontal bones*. They are united together by a most curious and intricate dove-tailing, to defend from injury the brain which lies beneath the upper part of them. Lower down, and where the cavity of the nose is to be defended, their

Formation
of the head.

union is sufficient, but far less complicated. The mechanism is here, as in every part of the frame, and every part of the universe, wisely adjusted to the necessities and wants of the animal.

Few things more clearly indicate the breed or blood of the horse than the form of the frontal bones. Who has not remarked the broad angular forehead of the blood horse, giving him that beautiful expression of intelligence and fire, and the face gradually tapering from the forehead to the muzzle; and then compared it with the large face of the cart or dray horse, and the forehead scarcely wider than the face?

There is placed at the back of the eye, a considerable quantity of fatty substance, on which the eye may revolve easily and without friction. In aged horses, and in diseases attended with general loss of condition, much of this fat disappears; the eye becomes sunken, and the pit above the eye deepens.

CHAPTER II.

DISEASES OF THE SKULL—THE BRAIN—THE EARS—AND THE EYES.

WE now proceed to the *diseases* of the head, and the first of these is

PRESSURE ON THE BRAIN.

This may be produced by some fluid thrown out between the membranes, or occupying and distending the ventricles of the brain. In the grown horse this rarely occurs, but it is well known to breeders as an occasional disease of the foal, under the name of "water in the head." The head is either very much enlarged, or strangely deformed, or both; and the animal dies either in the act of foaling, or a few days after the birth. We cannot apply any effectual remedy.

MEGRIMS.

There is another kind of pressure on the brain, resulting from an unusual determination or flow of blood to it. This organ requires a large supply of blood to enable it to discharge its important functions. It is supposed that ten times more blood flows through the brain than through any other part of the frame of equal bulk. Nature, in the horse more than in many other animals, has made some admirable provisions to cause this great quantity of blood to flow into the brain without much velocity, and thereby to lessen the risk of suddenly overloading it or rupturing its vessels. The arteries pursue their course to the brain in a strangely winding and circuitous manner; and they enter the skull through bony holes which will admit of the enlargement of the vessels only to a very limited extent: yet, from various causes, of which the most common is violent exercise in a hot day, and the horse being fat and full of

Shape indicative of breed.

blood, more than the usual quantity will be sent to the head:—or from some negligence about the harness, as the collar being too small, or the curb-rein too tight, the blood will be prevented from returning from the head: and thus the larger vessels of the brain will be too long and injuriously distended, and, what is of more consequence, the small vessels which run through the substance of the brain will be enlarged, and the bulk of the brain will be increased, and it will press upon the origins of the nerves, and produce, almost without warning, loss of power and consciousness.

The mildest affection of this kind is known by the name of MEGRIMS.

Symptoms. It comparatively rarely happens when the horse is ridden, but should he be driven, and, perhaps, rather quickly, he may perform a part of his journey with his usual cheerfulness and ease, when all at once he will stop, shake his head, be evidently giddy, and half unconscious. In a minute or two this will pass over, and he will go on again as if nothing had happened.

Frequently, however, the attack will be of a more serious nature. He will fall without the slightest warning, or suddenly run round once or twice, and then fall. He will either lie in a state of complete insensibility, or struggle with the utmost violence. In five or ten minutes he will begin gradually to come to himself; he will get up and proceed on his journey, yet somewhat dull, and evidently affected and exhausted by what had happened, although not seriously or permanently ill.

This is a very dangerous disease—dangerous to the horse, which will occasionally die on the spot, and peculiarly dangerous to those who drive him, for there will frequently be no warning or opportunity to escape. It likewise happens, that whether the vessels have been weakened by this violent distension, and afterwards offer less resistance to the flow of blood, or, whatever be the cause, a horse that has once been attacked by megrims is very subject to a return of the complaint. No prudent man will drive a horse that has had a second attack, especially if, in the intermediate time, he has taken proper means to prevent a recurrence of the fit.

At the moment of attack, a person who is able to bleed should take three or four quarts of blood from the neck; or any one can cut the bars of the palate, whence a considerable and sufficient quantity of blood may be readily obtained. The driver should pat and soothe the animal, and carefully examine the harness, and pursue his journey as gently as circumstances will permit. When he gets home, a dose of physic* should be administered if the horse can be spared, and the quantity of dry food lessened, and mashes given, or green meat, or the horse should be turned out at night, or turned out altogether for two or three months.

* By physic, whenever the word occurs in this Treatise, we mean purgative medicine.

APOPLEXY.

The attack sometimes assumes a still more violent form. The horse falls and dies at once. It then rather resembles, or is the same with apoplexy in the human being. To this more serious form of the disease he is subject in the stable, and even at pasture; but there is generally some warning. He will be seen with the head low, extended almost to the ground, and supported against the manger. He staggers as he stands. If moved, he appears as if he would fall. His sight and hearing are evidently affected. This is not mad-staggers, for no inflammation of the brain is found; nor stomach-staggers, for there is no distension of the stomach. The horse will continue in this way from one hour to twelve. He then falls;—grinds his teeth;—his eyes are open, protruded, and fixed—the pupil is dilated;—there are twitchings about the frame;—the muzzle is cold;—the vein of the neck is evidently swelled;—he is unable to swallow;—the drink is returned by the nostril or the mouth, and the dung often voided involuntarily;—the twitchings increase to strong convulsions, and death speedily closes the scene.

If there be time for medical treatment, the course to be pursued is plain enough. Bleed copiously;*—take at once eight or ten quarts. Bleed from a vein in preference to an artery, for an artery which supplies the brain cannot be got at. Bleed from the jugular or common neck vein, for that returns the blood from the brain, and a large quantity rapidly drawn from this vein may possibly give relief. Next back-rake, or remove the dung from the lower intestine with the hand, and give a strong dose of physic: but the case is usually hopeless, and the most decisive and skilful treatment alone can avail. We decidedly object to two methods of cure adopted by some farriers, and farmers too. The first is to blow pepper (and Cayenne pepper if they can get it) up the nostrils of the horse. The violent sneezing that will be produced if the animal is not too insensible must probably, or almost certainly, rupture some of the vessels already over-distended. The other practice is to give spices and bark to rouse the animal. The effect of these would be to quicken the circulation, and to send yet more blood to that organ which already had a great deal too much.

STOMACH-STAGGERS.

A disease not much unlike this is known under the name of STAGGERS. There are two varieties of it—the sleepy or stomach-staggers, and the mad-staggers; frequently, however, they are only different stages of the same disease, or varying with the cause that produced them. In STOMACH-STAGGERS the horse stands dull, sleepy, staggering; when roused he looks vacantly around him; perhaps seizes a lock of hay, and dozes again with it in his mouth; at

* Full directions for bleeding will be given, when we describe the various operations which it may be necessary to perform on the horse.

length he drops, and dies: or the sleepiness passes off, and delirium comes on, when he falls, rises again, drops, beats himself about, and dies in convulsions. The cause of this is sufficiently evident; and the disease never occurs, except by the fault of those who have the management of the horse. It arises from over feeding. The horse has been permitted to get at a too great quantity of food, or food of an improper nature. When he has been kept for some hours without eating, and has been worked hard, and has become thoroughly hungry, he falls ravenously upon every kind of food he can get at; swallowing it faster than his small stomach can digest it; and no water being given to soften it, and to hasten its passage, the stomach becomes crammed, and having been previously exhausted by long fasting, is unable to contract upon its contents. The food soon begins to ferment and to swell, causing great distension; the brain sympathizes with this overloaded organ, and staggers are produced. We can easily imagine this, when we remember the sad headaches occasionally arising from an overfilled or disordered stomach. Sometimes the stomach is ruptured.

We have little to say of the treatment of the disease so far as medicine is concerned, except that as it is almost or quite impossible for the person most accustomed to horses to distinguish between the early stage of stomach and mad-staggers, (distension of the stomach, and inflammation of the brain) we should be most diligent and minute in our inquiry into the history of the horse for the preceding twenty-four hours—whether he could have got an undue quantity of food, or had been worked hard, and kept long fasting. Some say that there is a yellowness of the eye, and twitchings about the breast in the early stage of sleepy or stomach-staggers. We have seen a great many cases of stomach-staggers without this yellowness, or these catchings, and we believe that no one can certainly distinguish between the two, and that we must be guided entirely by the history of the case.

Bleed very largely;—that cannot do harm, and in mad staggers is indispensable. Give a good dose of physic—that also cannot do harm, although in stomach-staggers it cannot do much good, for it can scarcely find its way into the over-distended stomach, and it certainly cannot find its way through it. Keeping the horse from all food will be a very proper proceeding, whichever be the disease.

Some good judges have affirmed that a horse was never cured of stomach-staggers. It was formerly a very difficult thing, but the *stomach-pump* has done wonders in cases of poisoning in the human being, and, by means of a larger and somewhat altered pump, (which every veterinary surgeon, and, we think, every large proprietor of horses, should have on his premises,) this enormous mass of food may, without difficulty, be washed out.

If, however, we can say but little of the treatment of stomach-staggers, we have much to say of its prevention. It attacks old horses oftener than others, and horses that have been hardly

worked, or that have been worked for many hours without food. Let no farmer delude himself with the idea that it is contagious. If his horses have occasionally slight fits of the staggers, or if the disease carries off several of them, he may be assured that there is something wrong in his management. One horse may get at the corn-bin, and cram himself to bursting; but if several are attacked, it is time for him to look about him. The cause will generally be found to be too voracious feeding;—too much food given at once, and perhaps without water, after hard work and long fasting. Nothing is lost by the habitual use of the nose-bag, and a more equal division of the hours of labour and the times of feeding. Some careless and thoughtless people suffer their horses to go from morning to night without being fed, and then they wonder if sometimes the horses hang their heads, and droop, and cannot work. No horse should be worked more than four or five hours without being baited.

There is one consequence of this improper treatment, of which persons do not appear to be aware, although they suffer severely from it. A horse that has frequent half-attacks of staggers very often goes blind. It is not the common blindness from cataract, but a peculiar glassy appearance of the eye. If the history of these blind horses could be told, it would be found that they had been subject to fits of drooping and dulness, and these produced by absurd management respecting labor and food.

Staggers have been known to occur when the animal is at grass; but this usually happens in poor, hard-worked, half-starved animals, and soon after they have been turned out, either in rich pasture, or in a salt marsh, and in hot weather.

There are, however, few diseases of the horse that are not occasionally epidemic, or produced by some influence of the atmosphere, of the nature of which we are ignorant; and stomach-staggers sometimes prevails in particular districts, where there is nothing remarkably wrong in the treatment of the horse. There is at that time something in the atmosphere which weakens the stomach, and disposes it to indigestion, and causes a little error in feeding to be dangerous, or produces considerable disease under the common circumstances of feeding. When this is the case the proprietors of horses should be particularly on their guard, for in most of the horses which then die, the distended stomach will be observed, and will be the actual cause of death. It is very possible that, at certain seasons, some poisonous plants may prevail, or that the hay may not be so nutritive or digestible, and thus the stomach may be weakened. The farmer will weigh all these things in his mind, and act accordingly.

MAD-STAGGERS.

MAD-STAGGERS (inflammation of the brain, brain fever) can, as we have said, be at first with difficulty distinguished from the sleepy, or stomach-staggers, but, after a while, the horse suddenly begins to heave at the flanks;—his nostrils expand,—his

eyes unclose;—he has a wild and vacant stare, and delirium comes rapidly on. He dashes himself furiously about; there is no disposition to do mischief, but his motions are sudden and violent, and accompanied by perfect unconsciousness; and he becomes a terrifying and dangerous animal. This continues either until his former stupor returns, or he has literally worn himself out in frightful struggles.

There are only two diseases with which it can be confounded, and from both of them it is very readily distinguished, *viz.* colic and madness. In *colic* the horse rises and falls, but not with so much violence; he sometimes plunges, but he more often rolls himself about; he looks frequently at his flanks with an expression of pain, and he is conscious.

In *madness* there may be more or less violence; there is sometimes a determination to do mischief; and there is always consciousness.

Over-exertion, when the horse is too fat or full of blood, or especially during hot weather, is a frequent cause of inflammation of the brain; but whatever will produce general fever, may be the cause of mad-staggers.

The treatment adopted by the best practitioners is too often unsuccessful. The horse should be bled until he faints or drops; or if he be down, until he is evidently faint and weak. Both the neck-veins should be opened at once, and the fulness of the stream, or the quickness with which it is taken, is almost as important as the quantity. Physic should then be given. The purge that acts most quickly is the best, and that is the croton nut, powdered *at the time*, and given *in a drink*, in the dose of a half drachm, and followed by smaller doses of ten grains each, every six hours, with plenty of injections of warm soap and water, until the bowels are well opened. If the croton is not at hand, aloes may be given, but dissolved in hot water—an ounce of aloes at the first dose, and, afterwards, a quarter of an ounce every four hours, until purging is produced. This being effected, those medicines should be given which have a tendency to lessen the force of the circulation, and consequently, the determination of blood to the head. The most powerful of these are the foxglove, and tartar emetic, in doses of a drachm each, three or four times in the day. Hellebore should not be given on account of the previously too great determination of blood to the brain. The head should be blistered, but rowels and setons give useless pain, for the horse is either cured or dead before they perceptibly begin to act.

TETANUS, OR LOCKED-JAW.

The nerves proceed from the brain and spinal marrow, and convey the power of feeling and motion to the whole frame. This power may be best conceived by considering it as an influence proceeding from the brain to every part. In a state of health, it is regularly and uniformly distributed; but it is much affected by disease. It may rush on violently and without interruption, and we have cramp, and tetanus, or locked-jaw: or the stream may be

rapid, but with considerable suspensions, and we have fits; or it may be quite suspended, and we have palsy.

TETANUS is one of the most dreadful and fatal diseases to which the horse is subject. It is called LOCKED-JAW, because the muscles of the jaw are earliest and most powerfully affected. Tetanus is a constant spasm of all the voluntary muscles, and particularly of the neck, the spine, and the head. It is generally slow and very treacherous in its attack. The horse for a day or two does not appear to be quite well; he does not feed as usual; partly chews his food and drops it; and gulps his water. The owner at length finds out that the motion of the jaws is considerably limited, and some saliva is disengaging from the mouth. If he tries the mouth, he can open it only a very little way, or the jaws are perfectly and rigidly closed; and thus the only time in which the disease could have been successfully combated is lost.

The jaws are unnaturally fixed, and there is a stiffness of the neck; a difficulty in bringing the head round, and a prominence, and hardness, and unyieldingness of all the muscles of the neck; with an unusual protrusion of the head. It next occurs that the poor animal cannot bend his head. The retractor muscle is affected by spasm, and the eye is drawn into the socket—squinting outward—and the haw protruding over a portion of it. The nostril is expanded, the ear erect, and the countenance anxious;—the back and loins are stiff, and if he is turned in his stall, the whole body turns at once like an unbending piece of wood. The muscles of the belly are also affected by spasm, and he is *tucked up* (his belly contracted and drawn up) to a strange degree. The tail is erect, and constantly quivering. The extremities are singularly fixed;—the hind-legs straddling;—the fore-legs projecting forward and outward (as some one has aptly described it) like the legs of a stool. The pulse at first not much affected, but soon becoming quick, small, and irregular; the breathing more laborious as the disease proceeds; and the countenance wild and haggard, and expressive of extreme agony. The pain which attends the cramp of one limb will enable us to judge of that which must accompany universal spasm. If a person goes near the horse, or touches him in the slightest way, although he may be unable to move, yet the sudden quickening of the pulse will tell what the animal feels and fears. So the disease goes on for nine or ten days, until the animal is exhausted by the expenditure of nervous energy, and the continuance of torture.

If, from strength of constitution or medical treatment, he should recover, the first favourable symptom is a slight and short remission of the spasm; the time of the remission gradually lengthening, and the jaws a little relaxing; but the progress of cure is exceedingly slow, and the horse is left very weak.

Tetanus is evidently an affection of the nerves. A small fibre of some nerve has been injured, and the effect of that injury has spread to the origin of the nerve; the brain has become affected, and universal diseased action speedily follows. Locked-jaw generally arises from a wound, and oftener a wound of a

Causes of disease.

tendinous or ligamentous part; but depending not either upon the extent of the wound, or the degree of inflammation which may be excited. The time of the attack is uncertain, and may be postponed until the wound is nearly or quite healed. It occasionally follows nicking, docking, cropping; whether well or ill performed—whether properly attended to afterwards, or neglected. It has been traced to worms, and particularly to bots; but we do not think that there is any proof of this. Exposure to cold is a frequent cause; water dropping upon the back through the decayed roof of a stable; or the storm pelting upon the uncovered and shivering animal, while the thoughtless owner has sheltered himself.

The rational method of cure would seem to be, first to remove the local cause;—but this will seldom avail much. The irritation is become general, and the spasmodic action constitutional. The habit is formed, and will continue. It is well, however, to endeavour to discover the local cause. If it be a wound in the foot, let it be touched with the hot iron or the caustic, and kept open with digestive ointment. The new irritation thus produced may lessen or remove the old one. If it follows nicking, let the incision be made deeper, and stimulated by digestive ointment;—and if it arise from docking, let the operation be repeated higher. In treating the constitutional disease, efforts must be made to tranquilise the system, and the most powerful agent is bleeding. We have known twenty pounds of blood taken at once and with manifest advantage. There is not a more powerful means of allaying general irritation. Temporary relaxation of the spasm will at least follow, and that will give the opportunity to do another thing in order to reduce and quiet the disturbed system, and that is, to give physic. Here again, that physic is best which is speediest in operation, and will lie in the smallest compass. The croton has no rival in this respect. The first dose should be a half-drachm, and the medicine repeated every six hours, in doses of ten grains, until it operates. The bowels, in all these nervous affections, are very torpid, and there is little danger of inflammation from an over dose of physic. The operation of the physic may be assisted by frequent injections, each containing a drachm of aloes dissolved in warm water.

Then, as it is a diseased action of the nerves proceeding from the spinal marrow, the whole of the spine should be blistered—three or four inches wide. The horse should be placed in a warm stable, yet with pure air, and should be clothed with two or three additional rugs, or, what is much better, sheep-skins warm from the animal, with the raw side inward; and changed as soon as they become dry or putrid.

Having bled largely, and physicked and blistered, we seek for other means to lull the irritation, and we have one at hand, small in bulk and potent in energy—opium. Give at once a quarter of an ounce, reduced to powder, and made into a drink with gruel, or in a small call, (in its crude state it would be too long in dissolving in the stomach:) and give an additional drachm every six hours. If the jaw should be quite fixed, administer it in injections. The bowels must be

TIGHT BINDING

attended to during the exhibition of the opium, and aloes given in small doses, to keep them in a lax state. Camphor and assafoetida may be given by those who please;—we are not aware that they will do injury, but opium is the sheet anchor of the veterinary practitioner.

Great caution and patience are requisite in administering the drinks, for the elevating of the head seems to be exceedingly painful to the horse. A ball may be divided into small pieces, and with a piece of cane or whalebone conveyed to the back part of the mouth, where it will be dissolved, and must be swallowed.

As soon as possible the strength should be supported by nutritive food. The appetite seldom fails in this disease; and it is painful to see the repeated eager efforts of the poor animal to allay his hunger. When his jaws are most firmly fixed, he will sometimes be able to suck in the liquid from a moist mash;—if he has the slightest command over them, he will contrive to swallow the greater part of the mash: and should there be room to introduce the mouth of a small horn, he will thankfully take as much gruel as his attendant will give him. Until the jaws are firmly locked, he may be suffered to have hay, although he should only chew it and drop it from the mouth; for this action of the muscles of the jaws may delay or prevent their total closure. Little medicine will be wanted as he gets better; nourishing food, not too liberally administered, will constitute the best tonic; and should the weather be sufficiently warm, few things will do him more good than to turn him out for two or three hours in the middle of the day. It will extend the muscles of his neck, and bring him to the use of his limbs.

Against one mode of treatment we enter our protest, from its cruelty and its inutility—the application of cold. Some turn the animal out uncovered in a frosty night. We have no faith in the practice of this: but placing the poor horse under a pump, and letting the water flow upon his spasmed limbs for hours together, or dashing it violently upon him, while he crouches and groans all the while, is both cruel and useless.

FITS, OR EPILEPSY.

The stream of nervous influence is sometimes rapid, but the suspensions are considerable, and this is the theory of Fits, or Epilepsy. Fortunately the horse is not often afflicted with this disease, although it is not unknown to the breeder. The attack is sudden. The animal stops;—trembles;—looks vacantly around him, and falls. Occasionally the convulsions which follow are slight; at other times they are terrible. The head and fore part of the horse are most affected, and the contortions are most singular. In a few minutes the convulsions cease; he gets up; looks around him with a kind of stupid astonishment; shakes his ears; urines; and eats or drinks as if nothing had happened.

The only hope of cure consists in discovering the cause of the fits, and an experienced practitioner must be consulted, if the

animal be valuable; generally speaking, however, the cause is so difficult to discover, and the habit of fits is so soon formed, and they will so frequently return, even at a great distance of time, that he who values his own safety, or the lives of his family, will cease to use an epileptic horse.

PALSY.

The stream of nervous influence is sometimes stopped, and thence results Palsy. The power of the muscle is unimpaired, but the nervous energy is deficient. Palsy in the horse is usually confined to the hinder limbs. When purging has been too suddenly stopped, he becomes paralytic. It is sometimes the consequence of violent inflammation of the bowels. It is produced by falls, blows on the loins, injury in casting, and turning in a narrow stall. In these latter cases the spine has been evidently injured. Old carriage horses, and horses of draught of every kind, although not absolutely paralyzed, have often great stiffness in their gait, and difficulty of turning. Possibly they can turn one way and not the other. They are unwilling to lie down, from experience of the difficulty they would have in rising again. These are evident injuries of the spine, and a loss of some of the joints of the loins or back, and are without remedy; and so often is palsy. Bleeding, physicking, antimonial medicines, and stimulating embrocations, are the most likely means of cure.

DISEASES OF THE EYE.

The diseases of the eye constitute a very important, but a most unsatisfactory division of our work; for the maladies of this organ, although few in number, are frequent in their appearance; they are sadly obstinate, and baffle all skill. The eye of the horse appears to be naturally more disposed to disease than that of any other animal with which we are acquainted; and most assuredly there is no domestic animal, the treatment of whose diseases is so much at variance with common sense.

The eye itself is rarely injured. It is placed on a mass of fat, and it turns most readily, and the prong of the fork glances off; but the substance around the eye may be deeply wounded, and very considerable inflammation may ensue. This should be abated by poultices, and bleeding, and physic; but no probe should be used, under the foolish idea of ascertaining the depth of the wound, for, from the constant motion of the eye, it is almost impossible to pass the probe into the original wound, and the effort to accomplish it will give a great deal of pain, and increase the inflammation.

The horse has occasionally a scaly eruption on the edges of the eye lids, attended with great itching, in the effort to allay which, by rubbing the part, the eye may be blemished. The nitrated ointment of quicksilver, mixed with an equal quantity of lard, may be slightly rubbed on the edges of the lids with considerable good effect.

WARTS are sometimes attached to the edges of the lids, and are a

source of great irritation. When rubbed they bleed, and the common opinion is true that they are propagated by the blood. They ^{Warts, Haw,} may be taken off with a sharp pair of scissors, and their ^{&c.} roots touched with the lunar caustic.

The HAW* may be thickened, and project on the fore part of the eye. The eye is drawn back by the retractor muscle to relieve it from the painful influence of the light; and the haw being thus pushed forward, and thickened, and the neighbouring parts thickened, is unable to retract. Cooling applications, and bleeding and physic, will generally set all right. The farrier who talks of cutting out this important organ must be exceedingly ignorant.

In a very few instances long continued inflammation of the haw is followed by ulceration and eating away of the cartilage. If the Goulard lotion, and that succeeded by the white vitriol, fail to abate the inflammation or to retract the part, it may be necessary to extirpate it. The horse must be cast, and the aid of a veterinary surgeon is indispensable, for he alone can determine how much of the neighbouring membranes must likewise be removed.

COMMON INFLAMMATION OF THE EYE.

We may consider inflammation of the eye under two forms—the common and manageable, and the specific and fatal. The *Common Inflammation* is generally sudden in its attack. The lids will be found swelled, the eyes partially closed, with some weeping. The inside of the lid will be red, some red streaks visible on the white of the eye, and the cornea slightly dim. This is usually connected with some degree of catarrh or cold; but it is as often unaccompanied by this, and depends on external irritation, as a blow, or the presence of a bit of hay-seed or oat-husk within the lid, and towards the outer corner where the haw cannot reach it: therefore the lids should always be carefully examined as to this possible source of the complaint. The health of the animal is generally not at all affected; he feeds well, and performs his work with his usual spirit. Cooling applications to the eye, as the Goulard's extract in the proportion of a drachm, or half an ounce of the tincture of opium, to a pint of water, with mash-diet, and gentle physic, will usually get rid of this: or the inflammation will subside without medical treatment.

SPECIFIC OPHTHALMIA, OR MOON-BLINDNESS.

Should three or four days pass, and the inflammation not be abated, we may begin to suspect that it is the true *Ophthalmia*, especially if the eye be very impatient of light, and the cornea be considerably clouded: the aqueous humour then often loses its transparency, even the iris changes its colour, and the pupil is exceedingly contracted. We have now an obstinate disease to combat, and one which will generally maintain its ground in spite of all our efforts. For three, or

* An excrescence resembling a gristle, growing under the nether eyelid.

four, or five weeks, the inflammation will remain undiminished, or if it appears to yield on one day, it will return with redoubled violence on the next. At length, and often unconnected with any of the means we have been using, the eye begins to bear the light, the redness on the membrane of the lid and the white of the eye somewhat suddenly disappears, the cornea clears up, and the only vestige of disease which remains is a slight thickening of the lids, and apparent uneasiness when exposed to a very strong light.

If we imagine that we have got rid of the disease, we shall be sadly disappointed, for in the course of six weeks or two months, either the same eye undergoes a second and similar attack, or the other eye becomes affected. All again seems to pass over, except that the eye is not so perfectly restored, and a slight, deeply-seated cloudiness begins to appear; and after repeated attacks, and alternations of disease from eye to eye, the affair terminates in opacity of the lens or its capsule, attended with perfect blindness either of one eye or both. This affection was formerly known by the name of *moon-blindness*, from its periodical return, and some supposed influence of the moon. That planet, however, has not, and cannot have any thing to do with it.

What is the practitioner doing all this while? He is an anxious and busy, but almost powerless spectator. He foment the eyes with warm water, or applies cold lotions with the extract of lead or opium, or poultices to which these drugs may be added; he bleeds, not from the temporal artery, for that does not supply the orbit of the eye, but from the *angular vein* at the inner corner of the eye, or by scarifying the lining of the lid, or by subtracting a considerable quantity of blood from the jugular. The scarifying of the lids, which may be easily accomplished without a twitch, by exposing the inside of the lids, and drawing a keen lancet slightly over it, is the most effectual of all ways to abate inflammation, for we are then immediately unloading the distended vessels. He places his setons in the cheek, or his rowels under the jaw; and he keeps the animal low, and physicks, or gives fever medicine (digitalis, nitre, and emetic tartar); or, as some have done, considering it as a constitutional disease, administers the corrosive sublimate daily in doses of a scruple. The disease, however, ebbs and flows, retreats and attacks, until it reaches its natural termination, blindness of one or both eyes.

The horse is more subject to this disease from the age of four to six years than at any other period. He has then completed his growth: he is full of blood, and liable to inflammatory complaints, and the eye is the organ attacked from a peculiar predisposition in it to inflammation, the nature or cause of which cannot be explained. Every affection of the eye appearing about this age must be regarded with much suspicion. It is a common opinion that black horses are more subject to blindness than others. We have considerable doubt about this, or rather we believe that colour has no influence either in producing or aggravating the disease.

As this malady so frequently destroys the sight, and there are certain periods when the inflammation has seemingly subsided, and the inexperienced person would be deceived into the belief that all danger is at an end, the eye should be most carefully examined at the time of purchase, and the examiner should be fully aware of all the minute indications of previous or approaching disease. They are a slight thickening of the lids, or puckering towards the inner corner of the eye; a difference in the apparent size of the eye; a cloudiness, although perhaps scarcely perceptible, of the surface of the cornea, or more deeply seated, or a hazy circle round its edge; a gloominess of the eye generally, and dulness of the iris; or a minute, faint, dusky spot in the centre, with or without little fibres or lines diverging from it.

The cause of this inflammation is undoubtedly a strong predisposition to it in the eye of the horse, but assisted by the heated and poisoned air of many stables. Some of our readers whose stables are not too air-tight, see frequently a great deal of this disease; but if they knew its ravages where several horses are crowded together, and scarcely a breath of air admitted, they would deem themselves comparatively fortunate. The heated air has much to do with the production of the disease;—the poisoned air a great deal more; for every one must have observed, on entering a close stable early in the morning, strong fumes of hartshorn, which were painful to his eyes and caused them to water. What must be the constant action of this on the eyes of the horse? The dung of the horse, and the litter of the stables, when becoming putrid, give out fumes of volatile alkali or hartshorn; but besides this, the urine of the horse, for some purpose unknown to us, possibly to teach us to take better care of this useful servant, begins very soon after it is voided to give out an immense quantity of this pungent gas. If we are scarcely able to bear it when we stand in the stable for only a few minutes, we need not wonder at the prevalence of inflammation in the eye of the stabled horse, nor at the difficulty of abating inflammation while the eye continues to be exposed to such painful excitement. Stables are now much better ventilated than they used to be, and this disease is not so prevalent as it was fifty years ago.

The farmer may not be aware of another cause of this disease, to which his horse is more particularly exposed, viz. confinement in a dark stable. Many stables in the country have no glazed windows, but there is a flap which is open for a few hours in the day, or while the carter is employed in the stable, and when that is shut down almost total darkness prevails. Let our reader consider what are his sensations when he suddenly emerges from a dark room into the full glare of light; he is dazzled and bewildered, and some time passes before his vision is distinct. Let this be repeated several times in the day, and what will be the consequence? The sight will be disordered, and the eye irreparably injured. Then let him think of his poor horse, who often stumbles and starts through no fault of his own, although he is corrected for so doing, but because his eyes are necessarily weakened by these sudden

transitions, and disposed to take on this sad inflammation with all its fatal results.

The propagation of various diseases, and this possibly more than any other, from the sire to his progeny, has not been sufficiently considered by breeders. Let a stallion that is blind, or whose sight is defective, possess every other point and quality that can be wished, yet he is worse than useless; for a very considerable proportion of his offspring will most assuredly inherit his weak eyes, or become totally blind. There is no fact better established than this.

The most frequent consequences of this disease are cloudiness of the eye, and cataract. The cloudiness is singular in its nature. It will change in twenty-four hours from the thinnest film to the thickest opacity; and as suddenly the eye will nearly regain its perfect transparency, but only to lose it, and as rapidly, a second time. The most barbarous methods have been resorted to for the purpose of removing this cloudiness. Chalk, and salt, and sugar, and even pounded glass, have been introduced into the eye mechanically to rub off the film. It was forgotten that the cloudiness was the effect of inflammation, and that means so harsh and cruel were very likely to recall the inflammation; that these rough and sharp substances must of necessity inflict excruciating pain; and that, after all, it generally is not a film on the surface of the cornea, but a dimness pervading its substance, and even sinking deep within it, and therefore not capable of being rubbed off. Where the cloudiness can be removed, it will be best effected by first abating inflammation; and then exciting the absorbents to take up the grey deposit, by washing the eye with a very weak solution of corrosive sublimate, containing not more than a grain of the sublimate to an ounce of water.

Opacity of the lens is another consequence of inflammation. A white speck appears on the centre of the lens, which gradually spreads over it, and completely covers it. It is generally so white and pearly as not to be mistaken: at other times more hazy, deceiving the inexperienced, and occasioning doubt in the mind of the professional man. We have seen many instances in which the sight has been evidently affected or almost lost, and yet a different opinion has been given by very fair judges. The eye must be exposed to the light, and yet under the kind of shelter to which we have previously referred, in order to discover the defect. The pupil of the horse is seldom black, like that of the human being, and its greyish hue conceals the recent or thin film which may be spreading over the lens.

Cataract in the eye of the horse admits of no remedy, for two obvious reasons; the retractor muscle draws the eye back so powerfully and so deeply into the socket, that it would be almost impossible to perform any operation; and, could an operation be performed, and the opaque lens removed, the sight would be so imperfect, from the rays of light not being sufficiently converged, that the horse would be worse to us than a blind one. The man who has undergone the operation of couching, may put a new lens before his eye, in the form of a convex spectacle,

but we could not adapt spectacles to the eye of the horse, or fix them there.

GUTTA SERENA.

Another species of blindness is GUTTA SERENA, commonly called the *glass eye*. The pupil is more than usually dilated;—it is immoveable and bright, and glassy. This is palsy of the optic nerve, or its expansion, the retina; and is usually produced by determination of blood to the head. We have described it as a consequence of staggers. So much pressure has been occasioned on the base of the brain, that the nerve has been injured, and its function destroyed. The treatment of

Gutta Serena is quite as difficult as that of cataract. We have heard of successful cases, but we never saw one; nor should we be disposed to incur much expense in endeavouring to accomplish impossibilities. Reasoning from the cause of the disease, we should bleed and physic, and rowel. If we succeeded, it must be by constitutional treatment; but in the majority of cases, the pressure would have long ceased, although the mischief which it had effected remained. As to local treatment, the seat of disease is out of our reach.

BIG HEAD.

This appears to be a disease peculiar to horses in the western states.

The symptoms and remedies, as far as can be accurately ascertained, may be found in the following pages, under the head of Soundness, and the Purchase and Sale of Horses. (For a reference to that chapter see the Index.)

DISEASES OF THE NOSE AND MOUTH.

We now proceed to the description of the *face* of the horse, so called in contradistinction from the upper part of the head, containing the brain. The *nasal bones*, or bones of the nose, are connected with the frontal bones above, and with the lacrymal, and the bones of the upper jaw, on either side; they are united together by a plain suture, which is a continuation of the frontal, and they terminate in a point at the nostril. They are rounded and arched above, because they are exposed to occasional violence and injury, which the arch-form will enable them best to resist; and at the base of the arch, where the main strength should be, they are overlapped by the upper jawbone, as we have described the temporal bone overlapping the base of the parietal. These bones form a principal part of the face; and the length, or shortness, and the character of the face, depend upon them. The largeness and length of these bones constitute the striking difference between the head of the cart horse and of the blood horse.

In some horses, this arch is more than usually developed, and there is, besides, a prominence or increased archness about half-way down the nasal bones. These horses are said to have Roman noses, because this arch of the nose distinguishes the profile of some of the most celebrated of the ancient Romans. We cannot say that the breed of horses

in which the Roman nose usually occurs, possesses superior sagacity or courage; they are generally easy, good-tempered horses, excellent feeders, and hardy constitutioned, but possessing little blood. Many thorough-bred horses have a peculiarity the reverse of the Roman nose. There is a depression or hollow about the middle of the nasal bones. Although this be a characteristic of breeding, it often accompanies an uncontrollable and vicious temper.

These bones form the roof of an important cavity. The sides are constituted above by the nasal bones, and, lower down, by the upper jaw-bones, while plates from these latter bones project and compose the palate, which is both the floor of the nose and the roof of the mouth. Above is a bone called the *palatine*, although it contributes very little to the formation of the palate. It is the termination of the palate, or the border of an opening where the cavities of the mouth and nose meet.

This cavity is divided into two parts by a thick cartilage. When we open the nostril, we see the membrane by which the cartilage, and the whole of the cavity of the nose is lined, and by the colour of which, much more than by that of the lining of the eyelids, we judge of the degree of fever, and particularly of inflammation of the lungs, or any of the air passages. By the sore places or ulcerations discovered on this membrane, we likewise determine on the existence of glanders. This cavity is, on either side, occupied by two bones, which, from their being rolled up somewhat in the form of a turban, are called the *turbinated* or *turban-shaped* bones, part of the cartilage is cut away to display them. They are as thin as gauze, and perforated, like gauze, with a thousand holes. Between them are left sufficient passages for the air.

If they were unrolled they would present a very considerable surface; and on every part of them is spread the substance or pulp of the *olfactory*, or first pair of nerves. These bones, lined with delicate membranes, and covered by the olfactory nerves, are the *seat of smell*: and they are thus expanded, because the sense of smell in the horse must, to a very considerable degree, supply the place of the sense of touch and the lessons of experience in the human being. By this alone is he enabled to select, amongst the nutritive and poisonous herbage of the meadow, that which would support and not destroy him. The troops of wild horses are said to smell the approach of an enemy at a very considerable distance. In his domestic state, the horse does not examine the different food which is placed before him, with his eye, but with his nose; and if the smell displeases him, no coaxing will induce him to eat it. He examines a stranger by the smell, and, by very intelligent signs, expresses the opinion which he forms of him by this inquisition. The horse will evidently recognize his favourite groom when he has nothing else to indicate his approach but the sense of smell. These cavities are likewise organs of voice. The sound reverberates through them, and increases in loudness, as through the windings of a French horn.

The extension of the nostril at the lower part of these cavities is an important part of the face, and intimately connected with breeding,

courage, and speed. The horse can breathe only through the nose.

All the air which goes to and returns from the lungs must pass through the nostrils. In the common act of breathing, these are sufficiently large; but, when the animal is put on his speed, and the respiration is quickened, these passages must dilate, or he will be much distressed. The expanded nostril is a striking feature in the blood horse, especially when he has been excited and not over-blown. The sporting man will not forget the sudden effect which is given to the countenance of the hunter, when his ears become erect, and his nostrils dilate as he first hears the cry of the hounds, and snorts, and scents them afar off; and the painful and spasmed stretching of this part, in the poor over-driven post-horse, will show how necessary it is that the passage to the lungs should be free and open. The nostril should not only be large, but the skin and substance which cover the entrance into the nose should be thin and elastic, that they may more readily yield, when the necessity of the animal requires a greater supply of air, and afterwards return to their natural dimensions. Therefore, nature, which adapts the animal to his situation and use, has given to the cart-horse, that is seldom blown, a confined nostril, and surrounded by much cellular substance, and a thick skin; and to the horse of more breeding, whose use consists in his speed and his continuance, a wider nostril, and much more flexible.

The inhabitants of some countries were accustomed to slit the nostrils of their horses, that they might be the less distressed in the severe and long-continued exertion of their speed. The Icelanders do so to the present day. There is no necessity for this, for nature has made ample provision for all the ordinary and even extraordinary exertion we can require from the horse. Some very powerful muscles proceed from different parts of the face, to the neighbourhood of the nostrils, to draw them back, and dilate them.

There are also four distinct cartilages attached to the nostrils, which, by their elasticity, bring back the nostrils to their former dimensions, as soon as the muscles cease to act. The bones of the nose are also sharpened off to a point, to give wider range for the action of the muscles; while the cartilages are so contrived, as not only to discharge the office we have mentioned, but to protect this projection of bone from injury.

There are two circumstances, which, more than any others, will enable the veterinary surgeon, and the owner of a horse, accurately to judge of the character and degree of many diseases, and to which very few pay sufficient attention; these are the pulse, of which we shall presently speak, and the colour of the membrane of the nose, at which we have hinted, a few pages back, and of which we would again remind the reader. It is the custom of most veterinary surgeons, and of almost every horseman who takes any pains to ascertain for himself the state of his sick horse, to turn down the under eyelid, and to form his opinion by the colour which its lining presents. If it be very red, there is considerable fever;—if

Importance
of extended
nostrils.

Muscles.

Cartilages.

To judge of
disease by
the eye.

it be of a pale pinkish hue, there is little danger. The nose is more easily got at;—the surface presented to the view is more extensive;—the sympathy with almost all the important organs is greater;—and the changes produced by disease are more striking and more conclusive. Let the reader first make himself well acquainted with the uniform pale pink appearance of that portion of the membrane which covers the lower part of the cartilaginous partition between the nostrils, when the horse is in health, and quiet; then the increased blush of red, betokening some excitement of the system;—the streaked appearance of inflammation commenced, and threatening to increase—the intense florid red, of acute inflammation;—the pale ground with patches of vivid red, showing the half subdied, but still existing fever; the uniform colour, although somewhat redder than natural, predicting a return to a healthy circulation; the paleness approaching to white, marking the stage of debility, and sometimes intermingled with radiations of crimson, inducing the suspicion of lurking mischief; and the dark livid colour of approaching stagnation of the vital current: these, with all their shades of difference, will be guides to his opinion and treatment, which every one, who has studied them, will highly appreciate.

NASAL GLEET, OR DISCHARGE FROM THE NOSE.

The most frequent disease of this cavity is an increased and thicker discharge of fluid from the nose. It may be properly called a NASAL GLEET. There is a constant secretion of fluid to lubricate and moisten the membrane that lines the cavity of the nose, which, under catarrh or cold, is increased in quantity, and altered in appearance and consistence. This will properly belong to our account of catarrh or cold; but that to which we immediately refer is a continued and oftentimes profuse discharge when every symptom of catarrh and fever has passed away; an almost incredible quantity of thickened mucus, of different colours:—if the horse is at grass, almost as green as the food on which he lives;—or, if he be stabled, white, straw-coloured, brown, or even bloody, and sometimes evidently mingled with matter or pus; and either constantly running, or snorted out in masses many times in the day; teasing the horse, and a perfect nuisance in the stable, and to the rider. We have known this continue several months, and eventually destroy the horse.

If the discharge be not offensive to the smell, nor mixed with any matter, it is probably merely an increased and somewhat vitiated secretion from the cavities of the nose; and, all fever having disappeared, will frequently yield to small doses of blue vitriol, from one to two drachms, and given twice in the day. If fever or cough remain, the cough medicine which will hereafter be described must be combined with the tonic. If the discharge be mingled with pus, and very offensive, the vegetable tonics, gentian and ginger, may be added to the copper in doses of two drachms of the former, and one of the latter; but there is then reason to apprehend that the discharge will not be controlled, and will terminate in glanders. Turning into a

salt marsh will occasionally effect a cure, when both the mineral and the vegetable tonics have failed.

GLANDERS.

The next and most formidable of all the diseases to which the horse is subject, is GLANDERS. It was described by writers fifteen hundred years ago, and it was then, and is now, not only a loathsome, but an incurable disease; we shall therefore principally confine ourselves to the consideration of its symptoms, nature, and causes, and prevention, and degree of contagion, and these will afford much matter of interest to the farmer.

If we could obtain an authentic history of the glandered horse, we should find that, in the majority of instances, if the disease were bred in him, he had been dull, off his feed, losing flesh, and his coat staring; and that these appearances had for several weeks preceded the characteristic symptoms of glanders. These symptoms, however, may lead to, or be the causes of other diseases, or they may pass away, and the horse may return to perfect health. That which would be considered as the earliest, and an unquestionable symptom of glanders, would be an increased discharge from one or both nostrils; different from the discharge of catarrh, because it is usually lighter and clearer in its colour, and more glutinous or sticky. When rubbed between the fingers it has, even in an early stage, a peculiar, clammy, bird-limy feel. It is not discharged occasionally and in large quantities, like the mucus of catarrh, but it is constantly running from the nostril.

It is a singular circumstance, for which no satisfactory account has yet been given, that when one nostril alone is attacked, it is in a great majority of cases the near or left. M. Dupuy, the director of the veterinary school at Toulouse, gives a most singular account of this. He says that out of eight hundred cases of glanders that came under his notice, only one was affected in the right nostril.

This discharge, in cases of infection, may continue, and in so slight a degree as to be scarcely perceptible, for many weeks or months before the health and capabilities of the horse seem to be injured. It will remain for a long time almost transparent, yet gluey; and then it will begin to be mingled with pus; retaining, however, its sticky character, and being rarely offensive in the early stages. The constant flow of this secretion, and its stickiness, with the absence of cough either before or during the discharge, will be the only symptoms. In process of time, however, pus mingles with the discharge, and then another and a characteristic symptom appears. Some of this is absorbed, and the neighbouring glands become affected; and, if there be discharge from both nostrils, the glands within the under jaw will be on both sides enlarged. If the discharge be from one nostril only, the swelled gland will be found on that side alone. Glanders, however, will frequently exist at an early stage without these swelled glands, and some other diseases, as catarrh, will produce them. Then we must look out for

some peculiarity about these glands, and we shall readily find it. The swelling may be at first somewhat large and diffused, but the surrounding enlargement soon goes off, and one or two small distinct glands remain; and they are not in the centre of the channel, but *adhere closely to the jaw on the affected side.*

The membrane of the nose may now be examined, and will materially guide our opinion. It will either be of a dark purplish hue, or almost of a leaden colour, or of any shade between the two; or, if there be some of the redness of inflammation, it will have a purple tinge; but there will never be the faint pink blush of health, or the intense and vivid red of usual inflammation. Spots of ulceration will probably appear on the membrane covering the cartilage of the nose—not simple sore places, or streaks of abrasion, and quite superficial, but small ulcers usually approaching to a circular form, deep, with the edges abrupt and prominent. When these appearances are observed, there can be no doubt about the matter. Care should be taken, however, to ascertain that these ulcers do actually exist, for spots of mucus adhering to the membrane have been more than once taken for them. The finger should, if possible, be passed over the supposed ulcer, to determine whether it can be wiped away; and it should be recollected, as we have already hinted when describing the duct that conveys the tears to the nose, that the orifice of that duct, just within the nostril, and on the inner side of it, has been mistaken for a cancerous ulcer. This orifice is on the continuation of the common skin of the muzzle which runs a little way up the nostril, while the ulcer of glanders is on the proper membrane of the nose above; and the line of separation between the two is evident on the slightest inspection.

It is proper to state that this discharge has continued unattended by any other disease, or even by ulceration of the nostril for two or three years, and yet the horse was decidedly glandered from the beginning, and capable of propagating the malady.

When ulcers on the membrane of the nose have appeared, the constitution will be evidently affected. The horse will lose flesh; his belly will be tucked up; his coat will be unthrifty, and readily come off; cough will be heard; the appetite will be impaired; the strength will fail; the discharge from the nose will grow more purulent, discoloured, bloody, stinking; the ulcers in the nose will be larger and more numerous; and, the air-passages being obstructed, a grating, choking noise will be heard at every act of breathing. The lungs are now diseased; they are filled with tubercles or ulcerations; and the horse at length dies, an emaciated and loathsome object.

The symptoms frequently vary, and to a most puzzling degree. The discharge will be so slight as scarcely to be perceived, and known only by its stickiness; and the glands will not be in the least degree enlarged. At other times a very small enlarged gland may be found, adhering to the jaw, and may be stationary month after month, and the surgeon may be told that there has never

To judge
from the
membrane of
the nose.

Variation of
Symptoms.

been discharge from the nose. He will, however, be wrongly informed here; it has most assuredly existed, although perhaps to no great degree, at some former period, and he will generally without much difficulty discover it then, although perhaps in so small a quantity that the groom or carter will deny its existence; and he will principally satisfy himself with respect to it, by its gluey feeling.

Glanders have often been confounded with *strangles*, and by those who ought to have known better. *Strangles* are peculiar to young horses. The early stage resembles common cold, with some degree of fever and sore throat; generally with distressing cough, or at least frequent wheezing; and when the enlargement appears beneath the jaw, it is not a single small gland, but a swelling of the whole of the substance between the jaws; growing harder towards the middle; and after a while appearing to contain a fluid, and breaking. In *strangles* the membrane of the nose will be intensely red, and the discharge from the nose profuse, and purulent, or mixed with matter almost from the first; and when the tumour has burst, the fever will abate, and the horse will speedily get well.

Should the discharge from the nose continue for a considerable time after the horse has recovered from *strangles*, as it sometimes does, there is no cause for fear. Simple *strangles* need never degenerate into *glanders*. Good keep, and small doses of the blue vitriol given internally, will gradually make all right.

Glanders have been confounded with catarrh or cold, but the distinction between them is plain enough. Fever accompanies cold, and loss of appetite, and sore throat (the quidding of the food, and gulping of the water are sufficient indications of the latter of these); the discharge from the nose is profuse, and perhaps purulent; and the glands under the jaw, if swelled, are moveable, and there is a thickening around them, and they are tender and hot. With proper treatment the fever abates; the cough disappears; the swellings under the throat subside, and the discharge from the nose gradually ceases, or, if it remain, it is usually very different from that which characterizes *glanders*. In *glanders*, there is seldom cough of any consequence, and, generally, no cough at all.

A running from the nose, small in quantity, and from the smallness of its quantity drying about the edges of the nostril, and so presenting some appearance of stickiness, will, in a few cases, remain after severe catarrh, and especially after the influenza of spring; and these have gradually assumed the character of *glanders*, and more particularly when they have been accompanied by enlarged glands and ulceration in the nose. Here the aid of a judicious veterinary surgeon is indispensable; and he perhaps will experience considerable difficulty in deciding the case. One circumstance will principally guide him. No disease will run on to *glanders* which has not, to a considerable and palpable degree, impaired and broken down the constitution; and *every disease that does this will run on to glanders*. He will look then to the general state and condition of the horse, as well as to the situation

of the glands, the nature of the discharge and character of the ulceration.

If, after all, he is in doubt, an experiment may be resorted to, which wears indeed the appearance of cruelty, and which only the safety of a valuable animal, or of a whole team, can justify: he will inoculate an ass or a horse already condemned to the hounds with the matter discharged from the nose. If the horse be *glandered*, the symptoms of *glanders* or *farcy* will appear in the inoculated animal in the course of a few days.

The history we have given of the symptoms of *glanders* will pretty clearly point out its nature. It is an affection of the membrane of the nose. Some say that it is the production of tubercles, or minute tumours in the upper cells of the nose, which may long exist undetected, and hard to be detected except by a scarcely perceptible running from the nostril, caused by the slight irritation which they occasion. These tubercles gradually become more numerous; they cluster together, suppurate, and break; and small ulcerations are formed. The ulcers discharge a poisonous matter, which is absorbed and taken up by the neighbouring glands, and which, with greater or less rapidity, vitiates the constitution of the animal, and is capable of communicating the disease to others. Other surgeons content themselves with saying that it is an inflammation of the membrane of the nose, which may assume an acute or chronic form, or in a very short time, or exceeding slowly, run on to ulceration.

The malady proceeds as we have already described it, but, before its termination, becomes connected with *farcy*. Few horses die of *glanders* without exhibiting some appearance of *farcy*; and *farcy*, in its latter stages, is almost invariably accompanied by *glanders*:—*they are different forms or stages of the same disease*.

There can be no doubt that the membrane of the nose is the original seat of *glanders*; that the disease is for a time purely local; that the inflammation of the tubercles must proceed to suppuration before that matter is formed on which the poisoning of the constitution depends; that the whole circulation does at length become empoisoned; and that the horse is destroyed by the general irritation and disease produced.

Glanders may be either bred in the horse, or communicated by contagion. What we have further to remark on this malady will be arranged under these two heads.

Improper stable management we believe to be a far more frequent cause of *glanders* than contagion. The air which is necessary to respiration is changed and empoisoned in its passage through the lungs, and a fresh supply is necessary for the support of life. That supply may be sufficient, barely to support life, but not to prevent the vitiated air from again and again passing to the lungs, and producing irritation and disease. The membrane of the nose, possessed of extreme sensibility for the purposes of smell, is easily irritated by this poison, and close and ill-ventilated stables oftenest witness the ravages of *glanders*. Professor Coleman relates a case

which proves to demonstration the rapid and fatal agency of this cause. "In the expedition to Quiberon, the horses had not been long on board the transports, before it became necessary to shut down the hatchways (we believe for a few hours only); the consequence of this was, that some of them were suffocated, and that all the rest were disembarked either glandered or farcied."*

In a close stable, the air is not only poisoned by being repeatedly breathed, but there are other and more powerful sources of mischief. The dung and the urine are suffered to remain fermenting, and giving out injurious gases. In many dark and ill-managed stables a portion of the dung may be swept away, but the urine lies for days at the bottom of the bed, the disgusting and putrefying nature of which is ill concealed by a little fresh straw which the lazy horsekeeper scatters over the top.

The stables of the gentleman are generally kept hot enough, and far too hot, although, in many of them, a more rational mode of treatment is beginning to be adopted; but they are lofty and roomy, and the horses are not too much crowded together, and a most scrupulous regard is paid to cleanliness. Glanders seldom prevail there. The stables of the farmer are ill-managed and filthy enough, and the ordure and urine sometimes remain from week to week, until the horse lies on a perfect dunghill, while there is no declivity to drain away the moisture, nor any regular pavement to prevent it from soaking into the earth, nor any water to clean even the surface, but the only instrument of purification is an old stumped broom. Glanders seldom prevail there; for the same carelessness which permits the filth to accumulate, leaves many a cranny for the wind to enter, and sweep away the deleterious fumes from this badly roofed and unceiled place.

The stables of the horse-dealer are hot enough; but a principle of strict cleanliness is enforced, for there must be nothing to offend the eye or the nose of the customer; and there glanders are seldom found. but if the stables of many of our post-horses, and of those employed on our canals, be examined, almost too low for a tall horse to stand upright—too dark for the accumulation of filth to be perceived—too far from the eye of the master,—ill-drained, and ill-paved,—and governed by a false principle of economy, which begrudges the labour of the man, and the cleanliness and comfort of the animal;—these will be the very hot-beds of the disease, and in many of these establishments it is an almost constant resident.

When speaking of inflammation of the eye, and the effect of ill-ventilated stables in producing it, we remarked that the urine of the horse contained an unusually large quantity of hartshorn; that the litter wetted by it was disposed most rapidly to ferment, and that the gases extricated must be extremely prejudicial to so delicate an organ. It may, then, be easily imagined that the constant presence of those

* See Percival's excellent Lectures on the Veterinary Art, vol. iii. p. 455.

pungent fumes, and the irritation which they would cause on that membrane which is the very seat of smell, must predispose for, and often generate a disease which is primarily an affection of this membrane.

Glanders may be produced by any thing that injures, or for a length of time acts upon, and weakens the vital energy of this membrane. They have been known to follow a fracture of the bones of the nose. They have been the consequence of violent catarrh, and particularly the long continued discharge from the nostrils, of which we have spoken. They have been produced by the injection of stimulating and acrid substances up the nostril; and every thing that weakens the constitution generally, will lead to glanders. It is not only from bad stable-management, but from the hardships which they endure, and the exhausted state of their constitution, that post and machine horses are so subject to glanders; and there is scarcely an inflammatory disease to which the horse is subject, that is not occasionally wound up and terminated by the appearance of glanders.

Glanders, however, are highly contagious. The farmer cannot be too well aware of this; and, considering the degree to which they often prevail, the legislature would be justified in interfering by some severe enactments, as they have done in the case of the small-pox in the human subject. The early and marked symptom of Contagion. glanders is a discharge from the nostrils of a peculiar character; and if that, even before it becomes purulent, be rubbed on a wound, or on a mucous surface, as the nostrils, it will produce a similar disease. Glanders are not communicated by the air or breath. If the division between two horses were sufficiently high to prevent all smelling and snorting at each other, and contact of every kind, and they drank not out of the same pail, a sound horse might live for years, uninfected, by the side of a glandered one. The matter of glanders has been mixed up into a ball, and given to a healthy horse, without effect; yet in another experiment of the same kind, the poor animal died. The mouth or gullet had probably some small wounds or ulcers in it. Some horses have eaten the hay left by those that were glandered, and no bad consequence has followed; but others have been speedily infected. The glanderous matter must come in contact with a wound, or fall on some membrane, thin and delicate like that of the nose, and through which it may be absorbed. It is easy, then, accustomed as horses are to smell each other, and to recognize each other by the smell; eating out of the same manger, and drinking from the same pail, to imagine that the disease may be very readily communicated. One horse has passed another when he was in the act of snorting, and has become glandered. Some fillies have received the infection, from the matter blown by the wind across a lane, when a glandered horse, in the opposite field, has claimed acquaintance by neighing or snorting. It is almost impossible for an infected horse to remain long in a stable with others, without irreparable mischief.

If some persons underrate the danger, it is because the disease may remain unrecognized in the infected horse for some months, or even years; and therefore when it appears, it is attributed to other causes, or to after inoculation. We would deeply impress it on the mind of the farmer, that no glandered horse should be employed on his farm in any kind of work, or permitted to remain for a day on his premises: nor should a glandered horse be permitted to work on any road, or even to pasture on any field. He may be capable of work for years after the disease has become undoubted, but mischief may so easily and extensively be effected, that the public interest demands that every infected animal should be summarily destroyed, or given over for experiment to a veterinary surgeon, or recognized veterinary establishment.

Our opinion of the treatment of glanders is implied in what we have just stated. There are a few instances of the spontaneous cure of chronic glanders, or glanders long established and slow in their progress. The discharge has existed for a considerable time; at length it has gradually diminished, and has ceased without medical treatment. but in the majority of these supposed cases, the matter was only pent up for a while, and then, bursting from its confinement, flowed again in double quantity: or if glanders have not reappeared, the horse, in eighteen or twenty-four months, has become farcied, or consumptive, and died. We view these cures with much suspicion: but even allowing that some have occurred, they are so few and far between, that our expressed opinion of the incurable nature of the disease, in the present state of veterinary knowledge, is scarcely affected. As for medicine, there is scarcely a drug to which a fair trial has not been given, and many of them have had a temporary reputation; but they have passed away, one after the other, and are no longer used. The blue vitriol and the Spanish-fly have held out longest, and in a few cases, either nature, or these medicines, have done wonders; but, in the majority of instances, they have palpably failed. Where the life of a valuable animal is at stake, and the owner takes every precaution to prevent infection, he may subject the horse to medical treatment; but we indignantly object to the slitting of the nostril, and scraping of the cartilage, and searing of the gland, and firing the frontal and nasal bones, and to those injections of pepper and mustard, corrosive sublimate and vitriol, by which the horse has been tortured, and the practitioner disgraced. At the veterinary school, and by veterinary surgeons, it will be most desirable that every experiment should be tried to discover a remedy for this pest; but, in ordinary instances, he is not faithful to his own interest or that of his neighbours, who does not remove the possibility of danger in the most summary way.

Supposing that glanders have made their appearance in the stables of a farmer, is there any danger after he has removed or destroyed the infected horse?—certainly there is, but not to the extent that is commonly supposed. There is no necessity

Infection left
in the stable.

for pulling down the racks and mangers, or even the stable itself, as some have done. The poison resides not in the breath of the animal, but in the nasal discharge, and that can only reach certain parts of the stable; and if the mangers, and racks, and bales, and partitions, are first well scraped, and next scoured with soap and water, and then thoroughly washed with a solution of the chloride of lime, (one pint of the chloride to a pailful of water,) and the walls are lime-washed, and the head-gear burned, and the clothing baked and washed, and the pails new painted, and the iron-work exposed to a red heat, all danger will cease.

The tricks which some dealers resort to at fairs and markets, in order to conceal the existence of glanders, are most infamous, and should be visited with the severest penalty of the law. Having given the horse a brushing gallop, that he may thoroughly clear the nose, some of them blow powdered alum up the nostrils a little while before he is shewn; others use white vitriol; and although the horse may be sadly tortured, about which they care nothing, the discharge is for some hours stayed. Others roll up a pledget of tow, and introduce it into the nostril, sufficiently high to escape common observation. Both these tricks may be discovered by the uneasiness of the animal, and his repeated efforts to sneeze, as well as by his general appearance, and if the disease be far advanced, most assuredly by the red or raw appearance of the nose, and by the stinking breath.

Happy should we be, if we could say any thing satisfactory of the prevention of glanders. The danger from exposure to infection can scarcely be avoided by those who travel much, and whose horses must stand in stables the inmates of which are so promiscuous, and so frequently changed. Although we cannot prevent contagion, we have more power in preventing the disease from occurring without contagion, and that is a point of importance, at least if the opinion of Professor Coleman be correct, that not one horse in a thousand receives the disease from contagion. To this, however, we cannot subscribe, for not only the history of cavalry regiments, but the experience of every breeder and proprietor of horses will prove the infectious nature of the complaint.

No fact is more certain, than that he who will keep a glandered horse in his stable, or work him in his team, will sooner or later lose the greater part of his stud. However, the generation of the disease may certainly be much prevented, and the first and most effectual mode of prevention will be to keep the stables cool and well ventilated, for the hot and and poisoned air of low and confined stables is one of the most prevalent causes of glanders.

Next to ventilation stands cleanliness; for the foul air from the fermenting litter, and urine and dung, must not only be highly injurious to health generally, but irritate and predispose to inflammation that delicate membrane, which is the primary seat of the disease. If to this be added regular exercise, and occasional green meat during the summer, and carrots in the winter, we shall have stated all that can

be done in the way of prevention. The farmer's horse in his cool or cold stable, and during the greater part of the year running loose when not at work, would be exempt from glanders, if, at the market and the fair, he were not so much exposed to contagion. In truth, glanders may be considered as the consequence of the stabling of the horse. In South America and in Arabia they are unknown; but wherever the European plan of stabling has been introduced, glanders have followed in its train: and therefore if any means are resorted to for the cure of glanders, the first, and perhaps the only effectual one would be to remove every exciting cause of the disease; to restore the horse almost to a state of nature; to turn him out for a long time, or at least to throw open his stable as much as the season and the weather will permit. Experience, however, tells us, that, although the symptoms have disappeared when the exciting causes of disease have been removed, and the horse has returned to his stable after a twelvemonth's run apparently sound, every symptom has gradually shewn itself again when these causes have been once more called into action.

FARCY.

Description of the disease. FARCY is intimately connected with glanders; they will run into each other, or their symptoms will mingle together, and before either arrives at its fatal termination its associate will almost invariably appear. An animal inoculated with the matter of farcy will often be afflicted with glanders, while the matter of glanders will frequently produce farcy. They are different types or stages of the same disease. There is, however, a very material difference in their symptoms and progress, and this most important of all, that while glanders are generally incurable, farcy, in its early stage and mild form, may be successfully treated.

Veterinary writers tell us that it is a disease of the absorbents in the skin. The small arteries are employed in building up and nourishing the various parts of the body; and another set of vessels are busied in taking up and carrying away that which is worn out and useless. There is no part of the body on which thousands of these little tubes do not open. Those of the skin are not only employed in removing useless materials, but in taking up various substances, and principally fluids which may be in contact with the skin. The little vessels which are thus occupied, collect together and form larger branches, which run in company with the superficial veins, and therefore farcy was once supposed to be a disease of the veins, and the tumours by which it is characterized accompany the course of the veins. The poison which they take up produces inflammation in them, which gradually spreads along the absorbent, and causes it to swell.

Appearance of Farcy buds These vessels, small as they are, contain valves, like those in the common pump, which permit the fluid to pass one way, but prevent its return. The inflammation, which pursues the natural course of the fluid through these tubes, that is, to-

wards the reservoir into which it is thrown before it enters the heart, seems to be arrested by these valves, and they inflame and swell; and therefore the first indication of this disease, even before any drooping, or loss of condition, or of appetite, is generally the appearance of little tumours—*farcy buds*—close to some of the veins, following the course of the veins, and connected together by a kind of cord, which farriers call *corded veins*. When they are few and small they may possibly exist for several weeks without being observed; but at length they increase in number and in size, and become painful and hot, and some of them begin to ulcerate. They appear usually about the face or neck, or inside of the thigh, and in the latter case there is some general enlargement of the limb, and lameness.

In some cases, however, the horse will droop for many days before the appearance of the *buttons* or *farcy buds*;—his appetite will be impaired;—his coat will stare;—he will lose flesh. The poison is evidently at work, but has not gained sufficient power to cause the absorbents to swell. In a few instances these buds do not ulcerate, but become hard and difficult to disperse. The progress of the disease is then suspended, and possibly for many months the horse will appear to be restored to health; but he bears the seeds of the malady about him, and, all at once, the farcy assumes a virulent form, and hurries him off. These buds have sometimes been confounded with the little tumours or lumps of *surfeit*. They are generally higher than these tumours;—not so broad;—have a more knotty feeling, and are principally found on the inside of the limbs, instead of the outside.

Termination. The increase of these buds marks the progress of the disease, and that progress is retarded by the resistance of these valves. The ulcers spread around, and are cured with considerable difficulty. Larger tumours appear in the groin and between the fore-leg, and ulcerate and spread, and the hollows and burrowings run deep in every direction, and the horse becomes a miserable and loathsome object. Glanders speedily appear, and death ensues.

Different forms of the disease. Few things are more unlike, or more perplexing, than the different forms which farcy assumes at different times. One of the legs, and particularly one of the hinder-legs, will suddenly swell to an enormous size. At night the horse will appear to be perfectly well, and, in the morning, one leg will be three times the size of the other, with considerable fever, and scarcely the power of moving the limb.

We do not mean that enlargement of the hind leg, with red shining skin, and exudation of fluid on the skin, reaching from the fetlock to the heel, round and smooth, very painful, attended with extreme lameness, and which the groom calls a farcy humour. This will yield to frequent fomentation, and a good dose of physic. It is effusion of fluid beneath the skin, from want of exercise and over-feeding. The enlargement of farcy occupies more of the limb, and presents an uneven surface, with sudden projections and depressions, and betrays in some part the corded absorbent, and the inflamed and swelled valve

At other times the head will be subject to this enlargement—the muzzle will particularly swell, and a stinking discharge will issue from the nose. Sometimes the horse will gradually lose flesh and strength; he will be hide-bound—mangy eruptions will appear in different parts; the legs will swell; cracks will appear at the heels, and the inexperienced person may conceive it to be a mere want of condition combined with grease.

Farcy, like glanders, springs from infection, or from bad stable management. It is produced by all the causes which give rise to glanders; but with this difference, that it is more frequently generated, and is sometimes strangely prevalent in particular districts. It will attack, at the same time, several horses in the same ill-conducted stable, and others in the neighbourhood, who have been exposed to the same predisposing causes. The practitioner is always afraid of seeing too much of this disease when he meets with one case of farcy, where there has been gross inattention to the horses. Some have denied that it is a contagious disease. They must have had little experience. It is true that the matter of farcy must come in contact with a wound, or sore, in order to communicate the disease; but accustomed as horses are to nibble and play with each other, and sore as the corners of the mouth are frequently rendered by the bit, it is easy to imagine that this may often be effected; and experience tells us, that a horse having farcy-ulcers cannot be suffered to remain with others without extreme risk. We recollect an instance in which virulent and fatal farcy was communicated by a scratch from the currycomb, which had been previously used on a glandered horse.

The treatment of farcy varies with the form it assumes. In the button or bud farcy, a mild dose of physic should be first administered. The buds should be then carefully examined, and if any of them have broken, the budding iron, of a dull red heat, should be applied to them; or if matter should be felt in them, showing that they are disposed to break, they should be penetrated with the iron. These wounds should be daily inspected, and if, when the slough of the cautery comes off, they look pale, and foul, and spongy, and discharge a thin matter, they should be frequently washed with a lotion, composed of a drachm of corrosive sublimate dissolved in an ounce of rectified spirit; the other buds should likewise be examined, and opened with the iron as soon as they evidently contain matter. When the wounds begin to look red, and the bottom of them is even and firm, and they discharge a thick white or yellow matter, the friar's balsam will speedily heal them. As, however, the constitution is now tainted, local applications will not be sufficient, and the disease must be attacked by internal medicines, as soon as the physic has ceased to operate. The corrosive sublimate will be the best alterative, and may be given in doses of ten grains, gradually increased to a scruple, with two drachms of gentian and one of ginger, and repeated morning and night until the ulcers disappear, unless the horse is violently purged, or the mouth becomes sore, when a drachm of blue vitriol may

be substituted for the corrosive sublimate. During this, the animal should be placed in a large box, with a free circulation of air; and green meat, or carrots, the latter more particularly, should be given him, with a fair allowance of corn. If he could be turned out during the day, it would be advantageous; but at all events he should be daily exercised. It is related by Mr. Blaine, that a horse so reduced as not to be able to stand, was drawn into a field of tares, and suffered to take his chance: the consequence was, that when he had eaten all within his reach, he was able to rise and search for more, and eventually recovered. In an early stage of the disease, and if glanders have not appeared, this treatment will frequently succeed. If, after the wounds have healed, the absorbents should continue to be corded, a blister, or light firing, will probably be serviceable.

It should be remembered, that a horse which has experienced one attack of farcy will be very subject to a relapse, and, therefore, should be regarded with a watchful eye, and occasional alteratives of Æthiop's mineral, with turpentine, in the proportions of one drachm of the former and four of the latter, made into a ball with linseed meal, should be given, and green meat or carrots, when circumstances will permit.

In the species of farcy attended with enormous swelling, it will be prudent to bleed moderately as well as to physic. The iron will not be necessary, but the same alterative medicine will be useful, and the leg should be frequently fomented with warm water. In both cases, although the air should be fresh and cool, the horse should be warmly clothed.

The WATER FARCY, confounded by name with the common farcy, and by which much confusion has been caused and a great deal of mischief done, is a dropsical affection of the skin, either of the chest or of the limbs generally, and belongs to another part of our subject.

A tumour termed a POLYPUS sometimes occupies one of the nostrils. It will grow to a very large size, obstructing the breathing, and sadly annoying the horse. As this can only be removed by an operation, which a veterinary surgeon alone is competent to perform, we do not describe it particularly.

THE LIPS.

The lips of the horse are far more important organs than many suppose. They are, in a manner, the hands of the horse; and if any one will take the trouble to observe the manner in which he gathers up his corn with them, and collects together the grass before he divides it with his nippers, he will be satisfied that the horse would be no more able to convey the food to his mouth without them, than the human being could without his hands.

The lips are composed of muscles for the sake of strength, and of a multitude of small glands, which secrete a fluid that covers the inside of the lips and the gums, in order to prevent friction, and likewise furnishes a portion of the moisture so necessary for the proper chewing of the food. The skin covering the lips is very

thin, because, if these are the hands of the horse, they should possess considerable feeling; and for the same purpose likewise, they are scantily covered with hair, and that hair is fine and short; and long hairs or feelers, called the beard, are superadded for the same purpose. The horse is guided and governed principally by the mouth, and therefore the lips are endowed with extraordinary sensibility, so that the animal feels the slightest motion of the hand of the rider or driver, and, as it were, anticipates his very thoughts. The *fineness* or *goodness of the mouth* consists in its exquisite feeling, and depends on the thinness of this membrane. We shall say more of this, when we have described the lower jaw and palate.

The lips of the horse should be thin, if the beauty of the head be regarded, for if they are loaded with fat they cannot be so sensible as they ought to be: yet, although thin, they should evidently possess power, and be strongly and regularly closed. A firm, compressed mouth, gives a favourable and no deceptive idea of the muscular power of the animal. Lips apart from each other, and hanging down, indicate weakness or old age, or dulness and sluggishness.

The depth of the mouth, or the distance from the fore part to the angle of the lips, should be considerable, for the sake of beauty. A short protuberant mouth would be a bad finish to the tapering face of the blood horse;—more room is likewise given for the opening of the nostril, which we have seen to be an important consideration. The bridle will not be carried well, and the horse will hang heavy on hand, if there be not considerable depth of mouth.

The angles of the lips are frequently made sore or wounded by the smallness or shortness of the snaffle, and by the unnecessary and cruel tightness of the bearing rein. This rein not only gives the horse a grander appearance in harness, and places the head in that position in which the bit most powerfully presses upon the jaw, but there is no possibility of driving without it, unless the arm of the driver were as strong as that of Hercules; and most certainly there is no safety if it be not used. There are few horses who will not bear upon something, and it is better to let them bear upon themselves than upon the arm of the driver. Without this control, many of them would hang their heads low and be disposed every moment to stumble, and would defy all pulling, if they tried to run away. There is, and can be no necessity, however, for using a bearing rein so tight as to cramp the muscles of the head, and which is indicated by the animal's continually tossing up his head:—they may indeed be cramped to such a degree, that the horse is scarcely able to bring his head to the ground, when turned to grass. The tight rein injures the angles of the lips, and frequently brings on poll-evil. We saw a poor horse at work, unroughed, during a severe frost. He was continually sliding about, and in danger of falling. The stupid driver buckled the bearing-rein as tight as he could, *to keep him up*; and the consequence was, that by the sudden and forcible pressing upon the iron, in the slips which would still every moment occur, the corners of the

Use of the
bearing rein.

mouth were absolutely cut through to a considerable depth. Except it be a restive or determined horse, there should be little more bearing on the mouth than is generally used in riding. This the horse likes to feel, and it is necessary for him in the swift gallop. We must have the bearing-rein, whatever some men of humanity may say against it; but we need not use it cruelly.

THE BONES OF THE MOUTH.

The bones in and giving form to the mouth, are the superior maxillary, or upper jaw, containing the grinders, the anterior maxillary, or lower part of the upper jaw, containing the upper-nippers or cutting-teeth; the palatine bone, and the posterior maxillary or under jaw containing all the under teeth. (See Skeleton.)

THE PALATE.

Adhering to a portion of the bones just described, and being the lining of the roof of the mouth, is the hard palate, composed of a firm dense substance divided into several ridges called *bars*.

Precisely in a line between the middle and second cutting teeth, and a little more than an inch within the mouth, the artery and vein make a curve. They may there be cut down upon with a sharp knife, and a plentiful stream of blood will be obtained, which will usually stop of itself when two or three quarts of blood have been obtained. The artery being cut across will shrink, and soon cease to bleed, and the application of a sponge filled with cold water will generally stop the bleeding of the vein. No injury will result from the division of the nerve, for it is a mere nerve of feeling, distributed over those parts.

LAMPAS.

Some of the lower bars occasionally swell, and rise to a level with, and even beyond the edge of the teeth, and they are very sore, and the horse feeds badly on account of the pain he suffers from the pressure of the food on the bars. This is called the *LAMPAS*; and it may arise from inflammation of the gums, propagated to the bars, when the horse is shedding his teeth; (and young horses are more subject to it than others;) or from some slight febrile tendency in the constitution generally, as when a young horse has lately been taken up from grass, and has been over-fed, or not sufficiently exercised.

In the majority of the cases the swelling will soon subside without medical treatment; or a few mashes, and gentle alteratives, will relieve the animal. A few slight cuts across the bars with a lancet or penknife, and taking care to avoid the principal artery and vein of the palate, will relieve the inflammation, and cause the swelling to subside; indeed, this scarification of the bars will seldom do harm, although it is far from being so necessary as is supposed. To the brutal custom of the farrier, who sears and burns down the bars with a red hot iron, we do most peremptorily object. It is

Cause of the
disease.

Relief.

torturing the horse to no purpose; and it is rendering that part callous, on the delicate sensibility of which all the pleasure and safety of riding and driving depend. It may be prudent in case of lamppas, to examine the grinders, and more particularly the tushes, to see whether either of them is endeavouring to make its way through the gum. If with the gum lancet, or penknife, two incisions across each other be made on the tooth, the horse will experience immediate relief.

THE LOWER JAW.

The posterior or lower jaw may be considered as forming the floor of the mouth. The body or lower part of it contains the *Formation.* under cutting teeth, and the tushes, the sides are two flat pieces of bone, containing the grinders. On the inside, is a hole through which blood-vessels and nerves enter to supply the teeth, and some of which escape again at another hole on the outside, and near the nippers. The branches are broader and thinner, rounded at the angle of the jaw, and terminating in two processes. One, the *coracoid*, from its sharpness or supposed resemblance to a beak, passes under the zygomatic arch, and the temporal muscle, arising from the whole surface of the parietal bone, is inserted into it, and wrapped round it; and by its action, principally, the jaw is moved, and the food is ground. The other, the *condyloid*, or rounded process, is received into the glenoid (shallow) cavity of the temporal bone, at the base of the zygomatic arch, and forms the joint on which the lower jaw moves. This joint being placed so near to the insertion of the muscle, or the centre of motion, the temporal muscle must act with very considerable mechanical disadvantage, and must possess immense power.

This joint is admirably contrived for the purpose which the animal requires. It will admit freely and perfectly of the simple *Use.* motion of a hinge, and that is the motion of the jaw in nipping the herbage and seizing the corn. But the grass, and more particularly the corn, must be crushed and bruised before it is fit for digestion. Simple champing, which is the motion of the human lower jaw, and that of most beasts of prey, would very imperfectly break down the corn. It must be put into a *mill*; it must be actually *ground*.

The jaws contain the teeth, which are the millstones employed in this operation. The mouth of the horse at five years old contains forty teeth, viz. six nippers or cutting teeth in front, a tush on each side, and six molars, or grinding teeth, above and below; they are contained in cavities in the upper and lower jaws, surrounded by bony partitions, to which they are accurately fitted, and by which they are firmly supported. For a little way above these bony cavities, they are surrounded by a hard substance called the gum, so dense, indeed, and adhering so closely to the teeth and the jaws, as not to be separated without very great difficulty; singularly compact, that it may not be wounded by the hard or sharp particles of the food, and almost devoid of feeling, for the same purpose.

The term *nipper* is familiar to the horseman and the farrier, and

much better expresses the action of these teeth than the word *incisor* or *cutter* which is adopted by anatomists. Whoever has *Nipper.* observed a horse in the act of browsing, and the twitch of of the head which accompanies the separation of each portion of grass, will perceive that it is nipped or torn rather than cut off.

These teeth are covered with a polished and exceedingly hard substance, called the enamel; indeed, it is so hard that it almost *Enamel.* bids defiance to the action of a file. It spreads over that portion of the teeth which appears above the gum, and not only so but as they are to be so much employed in nipping the grass, and gathering up the animal's food, and in such employment even this hard substance must be gradually worn away, a portion of it, as it passes over the upper surface of the teeth, is bent inward, and sunk into the body of the teeth, and forms a little pit in them; and the inside and bottom of this being blackened by the food, constitutes the *mark* of the teeth, by the gradual disappearance of which, in consequence of the wearing down of the teeth, we are enabled for several years to judge of the

AGE OF THE ANIMAL.

The colt's nipping teeth are rounded in front, somewhat hollow towards the mouth, and present at first a cutting surface, *Six months old.* with the outer edge rising in a slanting direction above the inner edge. This, however, soon begins to wear down until both surfaces are level, and the *mark*, which was originally long and narrow, becomes shorter, and wider, and fainter. At six months the four nippers are beginning to wear to a level. The four middle teeth are evidently level—the corner ones becoming so. The mark in the two middle teeth is wide and faint; in the two next teeth it is darker, and longer, and narrower; and in the corner teeth it is darkest, and longest, and narrowest.

At the completion of the first year, a fourth grinder usually comes up, and the yearling has then, or soon afterwards, six *One year.* nippers, and four grinders above and below in each jaw, which, with the alteration in the appearance of the nippers, will enable us to calculate pretty nearly the age of the foal, subject to some variations arising from the period of weaning, and the nature of the food.

At the age of one year and a half, the mark in the central nippers will be much shorter and fainter; that in the two other *One and a half year.* pairs will have undergone an evident change, and all the nippers will be flat.

At two years all this will be more manifest. About this period a *Two years old.* fifth grinder will push out, and now, likewise, will commence another process. The first teeth are adapted to the size and wants of the young animal. They are sufficiently large to occupy and to fill the colt's jaws; but when the jaws are expanded with the increasing growth of the animal, the teeth are separated too far from each other to be useful, and another and larger set is required

Evident provision is made for these, even before the colt is foaled. In cavities in the jaw, beneath the first and temporary teeth, are to be seen the rudiments of a second and permanent set. These gradually increase, and some with greater rapidity than others, and pressing upon the roots or fangs of the first teeth, the consequence of this pressure is, not that the first teeth are forced out, but the portion pressed upon gradually disappears; it is *absorbed*—taken up, and carried away, by numerous little vessels, whose office it is to get rid of the worn out or useless part of the system. This absorption continues to proceed as the second teeth grow and press upon their predecessors, until the whole of the fang is gone, and the crown of the tooth, or that part of it which was above the gum, having no longer firm hold, drops out, and the second teeth appear, larger and stronger, and permanent. In a few instances, however, the second teeth do not rise immediately under the temporary or milk teeth, but somewhat by their side, and then, instead of this gradual process of absorption and disappearance from the point of the root upwards, the root being compressed sideways, diminishes throughout its whole bulk; the crown of the tooth diminishes with the root; and the whole is pushed out of its place, to the forepart of the first grinder, and remains for a considerable time, under the name of a *wolf's tooth*, causing swelling and soreness of the gums, and frequently wounding the cheeks. These would be gradually quite absorbed, but the process might be slow and the annoyance would be great; and therefore it is proper to get rid of these diminutive teeth, either by punching them out, or drawing them as soon as they are perceived.

This change of teeth commences in those which earliest appeared, and, therefore, the front or first grinder gives way at the age of two years, and is succeeded by a larger and permanent tooth. Now, likewise, seriously commences, in too many cases, the roguery of horse-dealers and breeders. A colt rapidly increases in value, as his age and growth increase. A three-year-old colt is worth twenty-five per cent. more than a two-year-old one; and if a dealer has a strong and likely colt, that was dropped early in the year, and whose form and points might deceive the unwary, he is anxious to pass him if he can for a three-year-old. To accomplish this, he must give him a three-year-old mouth; and between two years and a half and three years, the two middle nippers are displaced, and succeeded by two permanent teeth.

During the period between the falling out of the central milk nippers, and the coming up of the permanent ones, the colt, having a broken mouth, may have some difficulty in grazing. If he should fall away considerably in condition, he should be fed with corn, or cut meat.

This cut will represent a three year-old mouth. The central teeth are larger than the others, with two grooves in the outer convex surface, and the mark is long, narrow, deep and black; and not having yet attained their full growth, they are not so

Three
year-old.

high as the others. The mark in the two next nippers is nearly worn out, and it is wearing away in the corner nippers. Is it possible to give this mouth to an early two-year-old? The ages of all horses are reckoned from May, but some are foaled even so early as January, and being actually four months over the two years, if they have been well nursed and fed, and are strong and large, they may with the inexperienced, have an additional year put upon them. The central nippers are punched or drawn out, and the others appear three or four months earlier than they otherwise would. In a natural process they could only rise by long pressing upon, and causing the absorption of the first set. The first set mechanically oppose their rising, and that opposition being removed, it is reasonable to imagine that their progress will be more rapid. Three or four months will be gained, and these three or four months may enable the breeder to term him a late colt of a preceding year. To him, however, who is accustomed to horses, (although it is long practice alone which could give this facility of judgment,) the general form of the animal, the little development of the forehead, the continuance of the mark on the next pair of nippers, its more evident existence in the corner ones, some enlargement or irregularity about the gums from the violence used in forcing out the teeth, the small growth of the first and fifth grinders, and the non-appearance of the sixth grinder, which if it is not through the gum at three years old, is swelling under it, and preparing to get through, any or all of these circumstances, carefully attended to, will be a sufficient security against deception.

It is so unusual to look at the teeth in the upper jaw of a young horse, that the dealer who wishes to give a false appearance of age, frequently confines his operation to the lower jaw, and, in consequence of this, when the teeth of the lower jaw are thus made to push out, they are still below the gum in the upper jaw, although, in the natural process, they are cut a little sooner in the upper than in the lower jaw. It may, therefore, be good policy always to examine both jaws.

A horse then at three years old ought to have the central permanent nippers growing—the other two pairs wasting—six grinders in each jaw, above and below—the first and fifth molars level with the others, and the sixth protruding. The sharp edge of the new incisors, although it could not be well expressed in our cut, will be very evident when compared with the neighbouring teeth.

As the permanent nippers grow, and press upon the teeth at their side, those teeth will begin gradually to diminish. Not only will the mark be wearing out, but the crowns of the teeth will be considerably smaller.

At three years and a half, or between that and four, the next pair of nippers will be changed, and the mouth at that time cannot be mistaken. The central nippers will have attained

Three and a
half years.

an additional year, but the fraud may be detected by an examination similar to that which we have already described.

At four years, the central nippers will be fully developed; the sharp edge somewhat worn off; the mark shorter, wider and fainter: the next pair will be up, but they will be small, with the mark deep, and extending quite across them; and the corner nippers larger than the inside ones, yet smaller than they were, flat, and the mark nearly effaced; the sixth grinder will have risen to a level with the others, and the tushes will begin to appear.

The tushes are four in number, two in each jaw, situated between the nippers and the grinders, much nearer to the former than the latter, and nearer in the lower jaw than in the upper, but this distance increasing in both jaws with the age of the animal. In shape it somewhat resembles a cone; it protrudes about an inch from the gum, and has its extremity sharp-pointed and curved. At the age of which we are now speaking, the tushes are almost peculiar to the horse, and castration does not appear to prevent or retard their developement. All mares, however, have the beginnings of them in the chambers of the jaw, and they appear externally in the majority of old mares. Their use is not evident:—perhaps in the wild state of the animal they are weapons of offence; so as that he can more firmly seize, and more deeply wound his enemy.

At four years and a half, or between that and five, the last important change takes place in the mouth of the horse. The corner nippers are shed, and the permanent ones begin to appear; the central nippers are considerably worn, and the next pair are beginning to show marks of usage. The tush has now protruded, and is generally a full half inch in height; externally it has a rounded prominence, with a groove on either side, and within it is evidently hollowed. Our readers need not be told that from the rising of the corner nipper the animal changes its name—the colt becomes a horse, and the filly a mare.

At five years the horse's mouth is almost perfect. The corner nippers are quite up, with the long deep mark irregular on the inside; and the other nippers bearing evident tokens of increasing wearing. The tush is much grown;—the grooves have almost, or quite disappeared; and the outer surface is regularly convex:—it is still as concave within, and with the edge nearly

as sharp as it was six months before; the sixth molar is quite up, and the third molar is wanting. This last circumstance, if the general appearance of the animal, and particularly before, and the wearing of the centre nippers, and the growth and shape of the tushes, be likewise carefully attended to, will prevent deception, if a late four-year-old be attempted to be substituted for a five. The nippers may be brought up a few months before their time, and the tushes a few weeks, but the grinder is with difficulty displaced. The three last grinders and the tushes are never shed.

At six years the *mark* on the centre nippers is worn out. There will still be a difference of colour in the centre of the tooth.

Six years. The cement filling the hole made by the dipping in of the enamel will present a browner hue than the other part of the tooth, and it will be evidently surrounded by an edge of enamel, and there will even remain a little depression in the centre, and also a depression round this case of enamel; but the deep hole in the centre of the teeth, with the blackened surface which it presents, and the elevated edge of enamel, will have disappeared. Persons not much accustomed to horses have been sadly puzzled here. They expected to find a plain surface of an uniform colour, and knew not what conclusion to draw when there was both discolouration and irregularity.

In the next incisors the mark is shorter, broader, and fainter; and in the corner teeth the edges of the enamel are more regular, and the surface is evidently worn. The tush has attained its full growth, being nearly or quite an inch in length, convex outward, concave within, tending to a point, and the extremity somewhat curved. The third grinder is fairly up, and all the grinders are level.

Now, or perhaps at a period of six months before, the horse may be said to have a perfect mouth. All the teeth are produced, fully grown, and have hitherto sustained no material injury. During these important changes of the teeth the animal has suffered less than could be supposed possible. With children, the period of teething is fraught with danger. Dogs are subject to convulsions, and hundreds of them die, from the irritation caused by the cutting or shedding of their teeth; but the horse appears to feel little inconvenience. The gums and palate are occasionally somewhat hot and swollen, but the slightest scarification will remove this. The teeth of the horse are more necessary to him than those of the other animals are to them. The child may be fed, and the dog will bolt his victuals, but the food of the horse must be well ground down, or the nutriment cannot be extracted from it.

At seven years, the mark, in the way in which we have described it, is worn out in the four central nippers, and fast wearing away in the corner teeth; and the tush is beginning to be altered. It is rounded at the point; rounded at the edges; still round without, and beginning to get round inside

At eight years old, the mark is gone from all the bottom nippers; the tush is rounder in every way; and the mark is now said to be out of the mouth. There is nothing remaining in the bottom nippers which can afterwards clearly show the age of the horse, or justify the most experienced examiner in giving a positive opinion.

Dishonest dealers have been said to resort to a method of prolonging the mark in the lower nippers. It is called *bishoping*, from the name of the scoundrel who invented it. The horse of eight or nine years old is thrown, and with an engraver's tool a hole is dug in the now almost plain surface of the corner teeth, and in shape and depth resembling the mark in a seven-year-old horse. The whole is then burned with a heated iron, and a permanent black stain is left: the next pair of nippers are sometimes lightly touched. An ignorant man would very easily be imposed on by this trick; but the irregular appearance of the cavity, the diffusion of the black stain around the tushes, the sharpened edges and concave inner surface of which can never be given again, and the marks on the upper nippers, together with the general conformation of the horse, can never deceive the careful examiner.

Horsemen, after the horse is eight years old, are accustomed to look to the nippers in the upper jaw, and some conclusion has been drawn from the appearances which they present. It cannot be doubted that the mark remains in them some years after it is obliterated from the nippers in the lower jaw; because the hard substance, or kind of cement, by which the pit or funnel in the centre of the tooth is occupied, does not reach so high, and there is consequently a greater depth of tooth to be worn away in order to reach it; and because the upper nippers are not so much exposed to friction and wear as the under. The lower jaw alone is moved, and pressed forcibly upon the food: the upper jaw is without motion, and has only to resist that pressure.

There are various opinions as to the intervals between the disappearance of the marks from the different cutting teeth. Some have averaged it at two years, and others at one. We are inclined to adopt the latter opinion, and then the age would be thus determined: at nine years the mark will be worn from the middle nippers—from the next pair at ten, and from all the upper nippers at eleven. During these periods the tush is likewise undergoing a manifest change: it is blunter, shorter, and rounder. In what degree this takes place in the different periods, long and most favourable opportunities for observation can alone enable the horseman to decide, or rather we believe that the tush alone will not enable us to form a very accurate judgment.

The tushes are exposed to but little tear and wear. The friction against them must be slight, proceeding only from the passage of the food by them, and from the motion of the tongue, or from the bit; and their alteration of form, although generally as we have described them, is frequently uncertain. The tush will sometimes be blunt at eight, and remain pointed at eighteen: and occasionally, according to the direction which they take, or degree in which they rub against each other,

the tushes on the different sides will present an apparent variation of one or two years. The upper tush, although the latest in appearing is soonest worn away.

Are there any circumstances to guide our judgment after this? There are those which will prepare us to guess at the age of the horse, or to approach within a few years of it, until he becomes very old: but there are none which will enable us accurately to determine; and the indications of age must now be taken from the shape of the upper surface of the nippers. At eight, they are all oval, the length of the oval running across from tooth to tooth: but as the horse gets older, the teeth diminish in size, and they at first diminish in width, and not in thickness. They become a little apart from each other, and their surfaces are rounded. At nine, the centre nippers are evidently so,—at ten, the

others begin to have the oval shortened. At eleven, the second pair of nippers are quite rounded, and at thirteen, the corner ones have that appearance. At fourteen, the faces of the central nippers become somewhat triangular. At seventeen, they are all so. At nineteen, the angles begin to wear off, and the central teeth are again oval, but in a reversed direction, *viz.* from outward, inward; and at twenty-one, they all wear this form. This is the opinion of some veterinary surgeons. We believe the statement is correct to a very considerable extent, but we leave our readers to form their own judgment.

It would be folly indeed to expect accuracy at this advanced age of the horse, when we are bound to confess, that the rules we have laid down for determining this matter at an earlier period, although they are recognized by horsemen generally, and referred to in courts of justice, will not guide us in every case. Stabled horses have the mark sooner worn out than those that are at grass, and a crib-biter may deceive the best judge by one or two years. The age of the horse, likewise, being uniformly calculated from the 1st of May, it is sometimes exceedingly difficult, or almost impossible, about that time, to determine whether the animal be a late foal of one year, or an early one of the next. At nine or ten, the bars of the mouth become less prominent, and their regular diminution will designate increasing age. At eleven or twelve, the lower nippers change their original upright direction, and project forward or horizontally; and they become yellow and covered with tartar. They are yellow, because the teeth must grow to answer to the wear and tear of them; but the enamel which covered their surface when they were first produced cannot be repaired, and that which wears this yellow colour in old age is the part which, in youth, was in the socket, and therefore destitute of enamel.

The upper nippers become arched, and project over the lower ones, wearing down the outer edge, and gradually making that the lowest, which was at first considerably the highest.

The general indications of old age, independent of the teeth, are deepening of the hollows over the eyes,—grey hairs, and particularly over the eyes, and about the muzzle; thinness

Appearances
in an advanced
age.

Other signs.

and hanging down of the lips; sharpness of the withers; sinking of the back; lengthening of the quarters; and the disappearance of windgalls, spavins, and tumours of every kind.

Of the natural age of the horse we should form a very erroneous estimate, from the early period at which he is now worn out and destroyed. Mr. Blaine tells us of a gentleman, who had three horses, which died at the age of thirty-five, thirty-seven and thirty-nine. Mr. Cully mentions one that received a ball in his neck, at the battle of Preston, in 1715, and which was extracted at his death, in 1758; and Mr. Percival gives an account of a barge horse that died in his sixty-second year.

DISEASES OF THE TEETH.

Of the diseases of the teeth in the horse, we know little. Carious or hollow teeth have occasionally, but not often, been seen; but the edges of the grinders from the wearing off of the enamel, or the irregular growth of the teeth, become rough, and wound the inside of the cheek; it is then necessary to adopt a summary but effectual method of cure, namely, to rasp them smooth. Many bad ulcers have been produced in the mouth, by the neglect of this.

The teeth sometimes grow irregularly in length, and this is particularly the case with the grinders, from not being in exact opposition to each other, when the mouth is shut. The growth of the teeth still going on, and there being no mechanical opposition to it, one of the back teeth, or a portion of one of them, shoots up half an inch or more above the others. Sometimes it penetrates the bars above, and causes soreness and ulceration; at other times, it interferes partially, or altogether, with the grinding motion of the jaws, and the animal pines away without the cause being suspected. Here the saw should be used, and the projecting portion reduced to a level with the other teeth. The horse which has once been subjected to this operation should afterwards be frequently examined, and especially if he lose condition; and, indeed, every horse that gets thin or out of condition, without fever, or any other apparent cause, should have his teeth and mouth carefully examined, and especially if he quids (partly chewing and then dropping) his food, without any indication of sore throat, or if he holds his head somewhat on one side, while he eats, in order to get the food between the outer edges of the teeth. A horse that has once had very irregular teeth is materially lessened in value, for, although they may be sawn down as carefully as possible, they will project again at no great distance of time.

THE TONGUE.

The tongue is the organ of taste, and employed in disposing the food for grinding between the teeth, and afterwards collecting it together, and conveying it to the back part of the mouth, in order to be swallowed. It is also the main instrument in drinking, and the canal through which the water passes in the act of drinking. The root of it

is firmly fixed at the bottom of the mouth, by a variety of muscles; the fore part is loose in the mouth. It is covered by a continuation of the membrane which lines the mouth, and which, doubling beneath, and confining the motions of the tongue, is called its *frænum* or bridle. On the back of the tongue, this membrane is thickened and roughened, and is covered with numerous conical *papillæ*, or little eminences, on which the fibres of a branch of the fifth pair of nerves expand, and on which the sense of taste depends. The various motions of the tongue are accomplished by means of the ninth pair of nerves. The substance of the tongue is composed of muscular fibres, with a great deal of fatty matter interposed between them, and which gives to this organ its peculiar softness.

DISEASES OF THE TONGUE.

The tongue is sometimes exposed to injury, from carelessness or violence in the act of drenching, or administering a ball, being pressed against, and cut by the edges of the grinders. A little diluted tincture of myrrh, or alum, dissolved in water, or even nature unassisted, will speedily heal the wound. The horse will bite his tongue,—most frequently in his sleep. If the injury be trifling, it requires little care, but in some instances, a portion of the tongue will be torn or nearly bitten off, and the assistance of a veterinary practitioner will be needed.

Bladders will sometimes appear along the under side of the tongue, which will increase to a considerable size, and the tongue itself will be much enlarged, and the animal will be unable to swallow, and a great quantity of ropy saliva will drivel from the mouth. This disease often exists without the nature of it being suspected. It resembles what is called the *blain* in the cow, which is a very serious complaint in that animal, frequently connected with much fever, and terminating in suffocation. If the mouth of the horse be opened, one large bladder, or a succession of bladders of a purple hue, will be seen to extend along the whole of the under side of the tongue. If they be lanced freely and deeply, from end to end, the swelling will very rapidly abate, and any little fever that remains may be subdued by cooling medicine. The cause of this disease is not clearly known. It usually proceeds, perhaps, from indigestion, connected with a general tendency to inflammation.

THE SALIVARY GLANDS.

In order that the food may be properly ground down to prepare it for digestion, it is necessary that it should be previously moistened. The food of the stabled horse, however, is dry, and his meal is generally concluded without any fluid being offered to him. Nature has made a provision for this. It has placed in the neighbourhood of the mouth, various glands, to secrete, and that plentifully, a limpid fluid, somewhat salt to the taste: this fluid is conveyed from the glands into the mouth, by various ducts in the act of chewing, and being mixed

with the food, renders it more easily ground, more easily passed afterwards into the stomach, and better fitted for digestion.

The principal of these is the *parotid* gland. It is placed in the hollow which extends from the root of the ear to the angle of the lower jaw.

The parotid gland sympathizes with every inflammatory affection of the upper part of the throat, and therefore it is found swelled, hot, and tender, in almost every catarrh or cold. The cold is to be attacked by the usual means; and a stimulating application, almost amounting to a blister, well rubbed over the gland, will best subdue the inflammation of that body.

In bad strangles, and sometimes in violent cold, this gland will swell to a great size and ulcerate, or an obstruction will rise in some part of the duct, and the accumulating fluid will burst the vessel, and a fistulous ulcer will be formed, very difficult to heal. A veterinary surgeon alone will be competent to the treatment of either case; and the principle by which he will be guided, will be to heal the abscess in the gland as speedily as he can; or, if the ulcer be in the duct, either to restore the passage through the duct, or to form a new one, or to cut off the flow of the saliva by the destruction of the gland.

The second source of the saliva is from the *submaxillary* glands, or the glands under the jaw. The submaxillary glands occupy the space underneath, and between the sides of the lower jaw, and consist of numerous small glands, each with its proper duct, which unite together, and form on each side a common duct or vessel, that pierces through the muscles at the root of the tongue, and opens in little projections or heads, upon the *frænum* or bridle of the tongue, about an inch and a half from the front teeth. When the horse has catarrh or cold, these glands, like the parotid gland, enlarge. This often takes place after strangles, and several distinct kernels are to be felt under the jaw. We have already stated, that they may be distinguished from those swellings which accompany or indicate glanders, by their being larger, generally not so distinct, more in the centre of the channel or space between the jaws, and never adhering to the jaw-bones. The farriers call them *vives*, and often adopt cruel and absurd methods to disperse them, as burning them with a lighted candle, or hot iron, or even cutting them out. They will, in the majority of instances, gradually disperse, as the disease which produced them subsides; or they will yield to slightly stimulating embrocations; or, if they are obstinate in their continuance, they are of no further consequence, than as indicating that the horse has laboured under severe cold or strangles.

During catarrh or inflammation of the mouth, the little projections marking the opening of these ducts on either side of the bridle of the tongue are apt to enlarge, and the mouth under the tongue is a little red, and hot and tender. The farriers call these swellings *BARBS* or *PAPS*, and as soon as they discover them, mistaking the effect of disease for the cause of it, set to work to cut them close

Ulcerated
gland.

Catarrh.

off. The bleeding which follows this operation somewhat abates the local inflammation, and affords temporary relief: but the wounds will not speedily heal; the saliva continues to flow from the orifice of the duct, and running into the irregularities of the wound, cause it to spread and deepen; and even when it heals, the mouth of the duct being frequently closed, and the saliva continuing to be secreted by the submaxillary gland, it accumulates in the duct, until that vessel bursts, and abscesses are formed, which eat deeply under the root of the tongue, and long torment the poor animal, and when closed, after a great deal of trouble, are very apt to break out again for months and years afterwards.

All that is necessary with regard to these paps or barbs is to abate the inflammation or cold which caused them to swell, and they will very soon and perfectly subside. He who ever talks of cutting them out is not fit to be trusted with a horse.

A third source of saliva is from glands under the tongue (the *sublingual* glands,) which open by many little orifices under the tongue, resembling little folds of the skin of the mouth, hanging from the lower surface of the tongue, or found on the bottom of the mouth. These likewise sometimes enlarge, during cold or inflammation of the mouth, and then they are called *gigs*, and *bladders*, and *flaps in the mouth*. They have the appearance of small pimples, and the farrier is anxious to cut them off, or burn them down. The better way is to let them alone, for in a few days they will generally disappear. Should any ulceration follow them, a little tincture of myrrh, or a solution of alum, will readily heal them.

Beside these three principal sources of saliva, there are little glands to be found thickly studded on every part of the mouth, cheeks, and lips, which pour out a considerable quantity of fluid, to assist in moistening and preparing the food.

Connected with these glands, and particularly with the submaxillary and parotid glands, and being either an inflammation of them, or of the cellular substance around them, is

THE STRANGLES.

This is a disease principally incident to young horses—usually appearing between the fourth and fifth year, and oftener in the spring than in any other part of the year. It is preceded by cough, and can at first be scarcely distinguished from common cough, except that there is more discharge from the nostril, of a yellowish colour, mixed with matter, but generally without smell; and likewise a considerable discharge of ropy fluid from the mouth, and greater swelling than usual under the throat. This swelling increases with uncertain rapidity, accompanied by some fever, and disinclination to eat, partly arising from the fever, but more from the pain the animal feels in the act of chewing. There is considerable thirst; but after a gulp or two, the horse ceases to drink, yet is evidently desirous of more. In the attempt to swallow, and sometimes when not drinking, a convulsive

cough comes on, which almost threatens to suffocate the animal, and thence probably the name of the disease. The tumour is about the centre of the channel under the jaw, it soon fills the whole of the space, and is evidently one uniform body, and may thus be distinguished from glanders, or the enlarged glands of catarrh. At length the centre of it becomes more prominent and softer, and it evidently contains a fluid. This rapidly increases, the tumour bursts, and a great quantity of pus is discharged. As soon as the tumour has broken, the cough subsides, and the horse speedily mends, although some degree of weakness may hang about him for a considerable time.

Of the cause of the disease we can say but little. Few horses, possibly none, escape its attack; but, that attack having passed over, the animal is free from it for the remainder of his life. Catarrh may precede, or may predispose to the attack, and undoubtedly the state of the atmosphere has much to do with it, for both its prevalence and its severity are connected with certain seasons of the year and changes of the weather. There is no preventive for the disease, nor do we believe that there is any thing contagious in it. There are strange stories told with regard to this; but the explanation of the matter is, that when several horses in the same farm or in the same neighbourhood have had strangles at the same time, they have been exposed to the same powerful but unknown exciting cause.

The treatment of strangles is very simple. As the essence of the disease consists in the formation and suppuration of the tumour under the jaw, the principal, or almost the sole attention of the practitioner should be directed to the hastening of these processes: therefore, as soon as the tumour of strangles evidently appears, the part should be actively blistered. Old practitioners used to recommend poultices; which, from the thickness of the horse's skin, must have very little effect, even if they could be confined on the part; and from the difficulty and almost impossibility of this, and their getting cold and hard, they must weaken the energies of nature, and delay the ripening of the tumour. Fomentations are little more effectual. A blister will not only secure the completion of the process, but hasten it by many days, and save the patient much pain and exhaustion; and it will produce another good effect—it will, previous to the opening of the tumour, abate the internal inflammation and soreness of the throat, and thus lessen the cough and wheezing.

As soon as the swelling is soft on the top, and evidently contains matter, it should be deeply and freely lanced. It is a bad, although frequent practice, to suffer the tumour to burst naturally, by which a ragged ulcer is formed, very slow to heal, and difficult of treatment. If the incision is deep and large enough, no second collection of matter will be formed: and that which is already formed may be suffered to run out slowly, all pressure with the fingers being avoided.

The part should be kept clean, and a little friar's balsam daily injected into the wound.

The remainder of the treatment will depend on the symptoms. If there is much fever, and evident affection of the chest, and which should carefully be distinguished from the oppression and choking occasioned by the pressure of the tumour, it will be proper to bleed. In the majority of cases, however, bleeding will not only be unnecessary, but injurious. It will delay the suppuration of the tumour, and increase the subsequent debility. A few cooling medicines, as nitre, emetic tartar, and perhaps digitalis, may be given, as the case requires. The appetite, or rather the ability to eat, will return with the opening of the abscess. Bran-mashes, or fresh cut grass, should be liberally supplied, which will not only afford sufficient nourishment to recruit the strength of the animal, but keep the bowels gently open. If the weakness be not great, no further medicine will be wanted, except a dose of mild physic, to prevent the swellings or eruptions which sometimes succeed to strangles. In cases of debility, a small quantity of tonic medicine, as camomile, and gentian with ginger, in doses of a couple of drachms, may be administered.

As strangles seem to be a disease from which few horses escape, and which, although attended with little danger, is sometimes tedious in its progress, and accompanied by much debility, some foreign veterinary surgeons have endeavoured to produce a milder disorder by inoculating, either with the matter from the tumour, or the discharge from the nose; and it is said that a disease, with all the characters of strangles, but shorter and milder in its course, has supervened.

CANKER AND WOUNDS IN THE MOUTH.

The mouth is injured much oftener than the careless owner suspects, by the pressure of a sharp bit. Not only are the bars wounded and deeply ulcerated, but the lower jaw between the tush and the grinders is sometimes torn even to the bone, and the bone itself affected, and portions of it come away. It may be necessary to have a sharp bit for the headstrong and obstinate beast, yet if that be severely and unjustifiably called into exercise, the animal may rear, and endanger himself and his rider; but there can be no occasion for a thousandth part of the torment which the trappings of the mouth often inflict on a willing and docile servant, and which either render the mouth hard, and destroy all the pleasure of riding, or cause the horse to become fretful or vicious.

Small ulcers are sometimes found in various parts of the mouth, said to be produced by rusty bits, but oftener arising from contusions inflicted by the bit, or from inflammation of the mouth. If the curb-bit is in fault, a snaffle or Pelham bit should be used; if there be inflammation of the mouth, a little cooling medicine may be administered; and to the ulcers themselves, tincture of myrrh,

diluted with an equal quantity of water, or an ounce of alum dissolved in twenty times the weight of water, may be applied with advantage.

THE PHARYNX.

Proceeding to the back of the mouth, we find the PHARYNX, (*carrying or conveying* the food towards the stomach.) It begins at the root of the tongue, is separated from the mouth by the soft palate which hangs down from the palatine bone, and extends to the epiglottis or covering to the windpipe. When the food has been sufficiently ground by the teeth, and mixed with the saliva, it is gathered together by the tongue, and then by the action of the cheeks and tongue and back part of the mouth, forced against the soft palate, which, giving way, and being raised upwards towards the entrance into the nose, prevents the food from going that way. It passes to the pharynx, and the soft palate falling down again, prevents its return to the mouth, and prevents, likewise, except in extreme cases, the act of vomiting in the horse. Whatever is returned from the stomach of the horse, passes through the nose.

The sides of the pharynx are lined with muscles which now begin powerfully to contract, and by that contraction the bolus is forced in until it reaches the gullet, which is the termination of the pharynx. Before, however, the food reaches the gullet, it has to pass over the entrance into the windpipe, and should any portion of it enter into that tube, much inconvenience and danger might result; therefore, this opening is not only lined by muscles by which it may be closed at the pleasure of the animal, but it is likewise covered by a heart-like elastic cartilage, the epiglottis, with its back towards the pharynx, and its hollow towards the aperture. The epiglottis yields to the pressure of the bolus passing over it, and lies flat on the entrance into the windpipe, and prevents the possibility of any thing entering into it; and no sooner has the food passed over it, than it rises again by its own elasticity, and leaves the upper part of the windpipe once more open for the purpose of breathing. The voice of animals is

The voice,
how produced.

produced by the passage of air through this aperture, communicating certain vibrations to folds of the membrane covering the part, and these vibrations are afterwards modified in their passage through the cavities of the nose. To understand the diseases of these parts, we must consider the anatomy of the neck generally.

CHAPTER III.

THE ANATOMY AND DISEASES OF THE NECK AND NEIGHBOURING PARTS.

The neck of the horse and of every animal belonging to the class *mammalia*, except one species, is composed of seven bones, called *vertebræ*, movable or turning upon each other. They are connected together by strong ligaments, and form so many distinct joints, in order to give sufficiently extensive motion to this important part of the body. The bone nearest to the skull is called the *atlas*, because, in the human being, it supports the head. In the horse, the head is suspended from it. It is a mere ring-shaped bone, with broad projections sideway; but without the sharp and irregular processes which are found on all the others. The *pack-wax*, or ligament, by which the head is principally supported, and which is strongly connected with all the other bones, passes over this without touching it, by which means the head is much more easily and extensively moved. The junction of the atlas with the head is the seat of a very serious and troublesome ulcer, termed

POLL-EVIL.

From the horse rubbing and sometimes striking his poll against the lower edge of the manger, or hanging back in the stall, and
How caused. bruising the part with the halter; or from the frequent and painful stretching of the ligaments and muscles, by unnecessary tight reining, and occasionally, we fear, from a violent blow on the poll, carelessly or wantonly inflicted, inflammation comes on, and a swelling appears, hot, tender, and painful. We have just stated, that the ligament of the neck passes over the atlas, or first bone, without being attached to it, and the seat of inflammation is between the ligament, and the bone beneath; and being thus deeply situated, it is serious in its nature and difficult of treatment.

The first thing to be attempted is to abate the inflammation by bleeding, physic, and the application of cold lotions to the
Remedy. part. By these means the tumour will sometimes be dispersed. This system, however, must not be pursued too far. If the swelling increases, and the heat and tenderness likewise increase, matter will form in the tumour; and then our object will be to hasten its formation by warm fomentations, poultices, or embrocations. As soon as matter is formed, which may be known by the softness of the tumour, and before it has time to spread around and eat into the neighbouring parts, it should be evacuated: and now comes the whole art of treating poll evil; *the opening into the tumour must be so contrived that all the matter shall run out*, and continue afterwards to run out as it is formed, and not collect at the bottom of the ulcer, irritating and corroding it. This can be effected by a seton alone. The needle should enter at the top of the tumour,

How to apply a seton.

penetrate through its bottom, and be brought out at the side of the neck, a little below the abscess. Without any thing more than this, except frequent fomentation with warm water to keep the part clean, and to obviate inflammation, poll-evil in its early stage, will frequently be cured. If the ulcer has deepened and spread, and threatens to eat into the ligaments of the joints of the neck, it may be necessary to stimulate its surface, and perhaps painfully so, in order to bring it to a healthy state, and dispose it to fill up; and, in extreme cases, even the scalding mixture of the farrier may be called into requisition. This, however, will be ineffectual, except the pus or matter is enabled, by the use of setons, perfectly to run out of the wound; and the application of these setons will require the skill and anatomical knowledge of the veterinary surgeon. In very desperate cases, the wound may not be fairly exposed to the action of our caustic applications, without the division of the ligament of the neck, by which we have described the head as being almost entirely supported. This, however, may be done with perfect safety, for although the ligament is carried on to the occipital bone, and some strength is gained by this prolongation of it, the main stress is on the second bone; and the head will continue to be supported, although the ligament should be divided between the second bone and the head. The divided ligament will soon unite again, and its former usefulness will be restored when the wound is healed.

PROPER FORM OF THE NECK.

In the carriage horse, a neck that is not half concealed by the collar is indispensable, so far as appearance goes; and it is only the horse with a neck of tolerable length, that will bear to be reined up, so as to give this part that arched and beautiful appearance which fashion demands. It is no detriment to the riding horse, and there are few horses of extraordinary speed, which have not the neck rather long. The race horse at the top of his speed not only extends it as far as he can, that the air-passages may be as straight as he can make them, and that he may therefore be able to breathe more freely, but the weight of the head and neck, and the effect increasing with their distance from the trunk, add materially to the rapidity of the animal's motion, by throwing his weight considerably forward. It has been said, that a horse with a long neck will bear heavy on the hand. We do not believe that either the length of the neck, or even the bulk of the head, has any influence in causing this. They are both counterbalanced by the power of the ligament of the neck. The *setting on* of the head is most of all connected with heavy bearing on the hand, and a short-necked horse will bear heavily, because, from the thickness of the lower part of the neck, consequent on its shortness, the head cannot be rightly placed. The head and neck, however, should be proportioned to each other. A short head on a long neck, or a long head on a short neck, would equally offend the eye.

The neck of a well formed horse, however fine at the top, should be

muscular at the bottom, or the horse to which it belongs will generally be weak and worthless. Necks devoid of this muscularity are called *loose necks* by horsemen, and are always considered a very serious objection to the animal. If the neck be thin and lean at the upper part, and be otherwise well-shaped, the horse will usually carry himself well, and the head will be properly curved for beauty of appearance, and ease of riding. When an instance to the contrary occurs, it is to be traced to very improper management, or to the space between the jaws being unnaturally small.

The back of the head being pulled back, and the muzzle protruded, the horse cannot by possibility carry his head well; he will become what is technically called a star-gazer;—heavy in hand, boring upon the bit, and unsafe. To remedy this, recourse is had, and in the majority of cases without avail, to the martingale, and against which the horse is continually fighting, and which is often a complete annoyance to the rider. Such a horse is almost useless for harness.

Inseparable from this is another sad defect, so far as the beauty of the horse is concerned;—he becomes *ewe-necked*;—he has a neck like a ewe—not arched above, and straight below, until near to the head, but hollowed above and projecting below; and the neck rising low out of the chest, even lower sometimes than the points of the shoulders. There can scarcely be any thing more unsightly in a horse. The head of such a horse can never be got down; and the bearing rein of harness must be to him a source of constant torture.

The mane is apt to become entangled, if it be not regularly combed. The teeth of the comb should be large, and sufficiently far apart. There never can be occasion to pull the mane, as grooms are too much accustomed to do, tugging it out in little parcels. It will then never lie smooth. A strong comb, with only two or three teeth in it, will keep it sufficiently thin and smooth.

THE BLOOD-VESSELS OF THE NECK.

Running down the inner part of the neck are the principal blood-vessels going to and returning from the head, with the windpipe and gullet. The external arteries are the *carotid*, of which there are two. They ascend the neck on either side, close to the windpipe, until they have reached the middle of the neck, where they somewhat diverge, and lie more deeply. Having reached the larynx, they divide into two branches, the external and the internal; the first goes to every part of the face, and the second, to the brain.

The vertebral arteries run through canals in the bones of the neck, supplying the neighbouring parts as they climb, and at length enter the skull at the large hole in the occipital bone, and ramify on and supply the brain.

We can conceive few cases in which it would be either necessary or justifiable to bleed from an artery. Even in mad-staggers the bleeding is more practicable, safer, and more effectual, from the jugular vein than from the temporal or any

Bleeding
from an
artery.

other artery. If an artery be opened in the direction in which it runs, there is sometimes very great difficulty in stopping the bleeding; it has even been necessary to tie the vessel in order to accomplish this purpose. If the artery be cut across, its coats are so elastic that the two ends are immediately drawn apart under the flesh on each side, and are thereby closed; and after the first gush of blood no more can be obtained.

THE VEINS OF THE NECK.

The external veins which return the blood from the head to the heart are the jugulars. The horse has but one on either side. The human being and the ox have two. It is the principal vessel by which the blood is conveyed from the head. The jugular is said to take its rise from the base of the scull; it then descends, receiving other branches in its way towards the angle of the jaw, and behind the parotid gland; and emerging from that, and being united to a large branch from the face, it takes its course down the neck. Veterinary surgeons and horsemen have agreed to adopt the jugular, a little way below the union of these two branches, as the place for bleeding; and a very convenient one it is; for it is easily got at, and the vessel is large. Of the manner of bleeding, and the states of constitution and disease in which it is proper, we shall speak hereafter, confining ourselves at present to an occasional consequence of bleeding, namely,

INFLAMMATION OF THE VEIN.

It is usual and proper, after bleeding, to bring the edges of the cut carefully together, and to hold them in contact by inserting a pin through the skin, with a little tow twisted round it. In ninety-nine cases out of a hundred the wound quickly heals, and gives no trouble, but in a few instances, from using a blunt instrument, or a dirty or rusty one; or striking too hard, and bruising the vein with the thick part of the fleam; or pulling the skin too far from the neck, and suffering some blood to insinuate itself into the cellular texture; or neglecting to tie the horse up for a little while, and thereby enabling him to rub the bleeding place against the manger, and tear out the pin; or from the animal being worked immediately afterward, and the collar pressing the blood against the orifice; or the reins or the bridle rubbing against it; or having several blows clumsily given, and a large and ragged wound made; or from some disposition to inflammation about the horse, for the bleeder is not always in fault if the wound does not heal. The edges of it separate, and are swelled and red; a discharge of thin bloody fluid proceeds from the cut, followed perhaps in a few days by matter; the neck swells, and is hot and tender; the vein, particularly above the wound, is hard and cordy; the cordiness of the vein increases more and more upward; and little abscesses begin to form about the original wound. This is sometimes a very serious case, for the inflammation continues to spread upwards, and destroys the horse. It is easy to imagine why it spreads upward.

Symptoms.

THE WINDPIPE.

because the blood has run off below the wound, and nothing remains there to irritate; but the vein becoming thickened in its coats, and diminished in its capacity, and at length quite closed by the inflammation, the blood descending from the head, and pressing upon the closed part, will coagulate; and that clot of blood will gradually increase, and the obstruction, and the inflammation produced by that obstruction, will increase, and that necessarily upward.

Human surgeons say that inflammation of a vein spreads *towards* the heart. In the horse, and we will venture to say in every animal, it spreads in the direction in which the coagulation is formed, and that in the jugular must be upward, although *from* the heart. In the veins of the arm and leg it will likewise spread upward, and then *towards* the heart, because the coagulation takes place in that direction.

The application of the hot iron to the orifice of the wound will sometimes stimulate it, and cause its edges to unite. When this fails, and the swelling is large, and abscesses have formed, it is for the veterinary surgeon to decide how far he will introduce setons into them, or inject a caustic liquid, or dissect out the diseased portion of the vein.

Should the vein be destroyed, the horse will not be irreparably injured; and perhaps, at no great distance of time, scarcely injured at all; for nature is ingenious in making provision to carry on the circulation of the blood. All the vessels conveying the blood from the heart to the different parts of the frame, or bringing it back again to the heart, communicate with each other by so many channels, and in such various ways, that it is impossible by the closure or loss of any one of them materially to impede the flow of the vital current. If the jugular be destroyed, the blood will circulate through other vessels almost as freely as before.

THE WINDPIPE.

In the fore part of the throat is placed a curiously constructed tube, extending from the back part of the mouth to the lungs, and designed for the conveyance of air to and from these organs. The windpipe of the horse is composed of nearly sixty rings of cartilage, connected together by strong and elastic ligaments. The rings are broad in front, narrowing behind, and there overlapping each other, so as to be capable of considerable extension and contraction; and across the posterior part run strong muscular fibres, which give to that portion of the tube a power of action, depending not indeed on the will, but on sympathy with other parts concerned in breathing.

This singular and beautiful mechanism deserves serious attention. It is necessary for the comfort, and even the existence of the animal, that this air-tube should be free from compression, and always open; and it is attached to the neck, long, and capable of the most varied motion. Would any tube composed of an uniform substance, however elastic, maintain its form and size amidst all these complicated motions? When the horse is browsing, the windpipe is an inch or more longer

than when the neck is arched; there is, therefore, the ligamentous substance between the circular rings, which will lengthen the tube when required, and immediately contract to its former dimensions when the force that caused the elongation is removed.

The windpipe is lined by a membrane, likewise curiously contrived. It is smooth and plain in front under the broad cartilaginous rings, and where little change of dimension can take place; but behind, it is puckered into several folds, running down the windpipe, and not across it, and adapting itself easily to any change in the size of the tube.

Then it is easy to imagine that the windpipe of a good horse should be large to admit the passage of a greater quantity of air; Best shape and in horses from which speed is required, as in the blood-horse, the windpipe is comparatively larger than in other breeds devoted to slower work.

The windpipe should project from the neck. It should be as it were detached from the neck, for two important reasons; first, that it may easily enter between the channels of the jaw, so that the horse may be reined up without suffering inconvenience; and, next, that being more loosely attached to the neck, it may more readily adapt itself to the changes required, than if it were enveloped by fat or muscle, to a certain degree unyielding: therefore, in every well-formed neck, it is indispensable that the windpipe should be prominent and loose on the neck. We do not require this in the heavy cart-horse, and we do not often find it, because he is not so much exposed to those circumstances which will hurry respiration, and require an enlargement in the size of the principal air-tube.

THE LARYNX.

At the top of the windpipe is placed the *larynx*. It is situated where, from the sudden bending or motion of the head, it is liable to more frequent and to greater injury than the windpipe; and therefore it is composed of stronger cartilages than that tube. First is the *thyroid*, or helmet-shaped cartilage, forming the front and side parts of the larynx, and protecting the other parts. Its bulk and strength are apparent on the slightest handling.

Immediately below the thyroid, and with its broad part behind, is the *cricoid*, ring-like cartilage. This is likewise for the purpose of strength in a part so exposed to injury, but not so strong as the thyroid because so much danger cannot threaten from behind.

ROARING.

The larynx and upper part of the windpipe are subject to various diseases. The first we shall mention is **ROARING** so called Diseases of the larynx. from a peculiar sound uttered by the horse when briskly trotted or galloped, particularly up hill. In moderate exercise it is scarcely, or not at all perceived, but when the animal is in brisk exercise it may be heard at the distance of several yards. It

may be easily detected by striking the horse suddenly, or even threatening him with a stick, when he will utter a singular grunt or groan.

It usually is explained as the consequence of inflammation of the part. A fluid, rapidly changing into a tough viscid substance, is thrown out, and adheres to the sides of the larynx and upper part of the windpipe, materially obstructing the passage, and sometimes running across it in bands. When the horse is blown, or his breathing much hurried, the air whistles through these obstructions. We believe this to be the most general cause of the disease, and a roarer is evidently unsound, for he is incapable of the exertion which may not only be occasionally, but ordinarily required of him.

Much light, however, has lately been thrown on other causes of this complaint. Many roarers have been examined after death, Cause. and no vestige of these bands has been found; but some have had the shape of the larynx and upper part of the windpipe materially deformed, crooked, and compressed; and others have presented no appearance of disease. Then we have been compelled to look out for other causes of roaring, and some very probable ones have been readily found. The parts may have been subject to inflammation, and some parts of the air-tube may have become thickened and inelastic. In this way the inflammation of strangles may have been communicated to the larynx or windpipe, followed by some alteration of structure. Roaring is no unusual consequence of strangles.

A more frequent cause, and previously unsuspected, is tight reining. There can be no doubt that many more carriage-horses become roarers, than those that are used for the saddle alone; and the explanation of this at once presents itself in the continued and painful pressure on these parts, caused by reining in the carriage-horse, and teaching him to bear himself well. We have seen the larynx, and that portion of the windpipe immediately beneath it, flattened and bent, and twisted in the strangest way, which could not have been produced by disease, but by mechanical injury alone. The mischief is usually done with young horses. The arched neck and elevated head of the carriage-horse is an unnatural position, from which the animal, most habituated to it, is eager to be relieved. Horse-breakers, and coachmen, and carters, should be made to understand, that when the horse's head is first confined by the bearing rein, great gentleness, and care, and caution, are necessary. Injury must be done if the Directions to hostlers. throat be violently pressed upon, and especially when it is exposed to additional danger, from the impatience of the animal, unused to controul, and suffering pain. The head of the riding horse is gradually brought to its proper place by the hands of the teacher, who skilfully increases, or relaxes the pressure, and humours and plays with the mouth; but the poor carriage-horse is confined by a rein that never slackens, and his nose is bent in at the expense of the larynx and windpipe, and the injury is materially increased, if the head be not naturally well set on, or if the neck be thick, or the jaws narrow.

The shape of the larynx and wind-pipe will occasionally be altered if they be thus squeezed between the jaws, and the bones of the neck or the muscles which expand the opening into the windpipe for the purpose of natural breathing, and especially of quick and hurried breathing, will be so compressed, that they will be incapable of full action, and by degrees will lose the power of action, even when not pressed upon, and, in fact, become palsied; and therefore, the opening not being sufficiently enlarged during the rapid breathing of the animal, moving with speed, the air will rush violently through the diminished aperture, and the sound termed *roaring* will be produced.

It is a common opinion that crib-biting frequently terminates in roaring. There is nothing in crib-biting that can possibly lead to roaring; but there is a method adopted to cure crib-biting, than which nothing can be more likely to produce it: we mean the straps which are so tightly buckled round the upper part of the neck, and which must compress, and sometimes distort or paralyse the larynx.

The habit of *coughing* a horse, to ascertain the state of his wind, is an occasional cause of roaring. The larynx or trachea is violently and painfully squeezed in this operation; and the violence being often repeated, inflammation and injury may ensue.

The treatment of roaring is very unsatisfactory. If we have been correct in our account of the nature and cause of the disease, a cure seems to be perfectly out of the question. If it arise from a distorted larynx, there is no mechanical contrivance that can restore the natural and perfect structure; if from a band or ring of lymph diminishing the size of the passage, we know not by what means that can be removed; or if the muscles of the larynx be palsied, we know not the stimulus that can rouse them again to action, or the manner in which that stimulus is to be applied.

In the early stage of the disease, whether it proceed from violent pressure on the part by improper curbing, or be connected with, or consequent on catarrh or strangles, or the enlargement of some neighbouring part, inflammation will be present, and we shall be justified in having recourse to those measures which will abate inflammation. Bleeding will not be improper if roaring is the consequence of previous disease; it will be indispensable, if it be connected with present disease of the chest. The degree to which the bleeding should be carried, will depend on the degree of general or local inflammation. To bleeding should succeed purging, and to this, medicines that will lessen the force of the circulation,—as nitre, emetic-tartar, and digitalis. These should be followed by blisters, to remove the inflammation, if possible, from an internal and important part to the skin. The blisters may at first be confined to the upper part of the throat, but, if unsuccessful there, they should extend over the whole length of the wind-pipe. In extreme cases, and where the obstruction seems to threaten suffocation, we may be justified in cutting into the wind-pipe, and either introducing a tube into the opening, or cutting out a portion of one of

To cure
roaring.

the rings. This operation, however, the agriculturist will scarcely dare to perform, although it is simple enough to him who understands the anatomy of the neck. It is called *bronchotomy*. By means of it, the animal will be enabled to breathe through an aperture below the seat of inflammation, or the distorted and obstructed part; and time will be given for the adoption of other modes of relief or cure. Some practitioners have talked of cutting into the windpipe, to extract the band or ring of coagulated matter that obstructs the passage; we can only say, that if they happen to hit upon the precise situation of this ring or band, they will be more fortunate than their folly deserves.

Another circumstance should be mentioned, and the breeder should not forget it, that the roarer, whether horse or mare, will often entail this disease on its progeny. This entailment of disease by the parent on the offspring is a subject which has not sufficiently engaged the attention, or entered into the calculation, of the agriculturist.

THE ŒSOPHAGUS, OR GULLET.

The gullet extends from the back part of the mouth to the stomach, and conveys the food from the one to the other. At the top of the neck, it is immediately behind the wind-pipe, but it soon inclines to the left, and runs down the neck close to the wind-pipe, and on its left; therefore when we give a ball to a horse, we watch the left side of the neck to see whether it passes down the gullet. Having entered the chest between the first two ribs, the gullet passes along the upper part of it, and then piercing the diaphragm, or midriff, enters the stomach. It is composed of three coats—the outer one of slight loose cellular substance: the middle one muscular, and divided into two distinct layers, the outermost layer having the fibres lengthways, by which the gullet may be shortened, and in shortening, widened for the reception of the food; the fibres of the inner layer running circularly round the tube, so that the portion immediately above a pellet of food, will, by its contraction, force the food downward, and by successive actions drive it into the stomach. The inner coat, which is a continuation of the membrane of the pharynx, lies in folds or plaits, extending lengthways. The muscular coat being highly elastic, readily gives way to the pressure of the food, and these plaits enable the inner or cuticular coat, likewise, sufficiently to dilate.

The gullet has in a few cases been strictured, or contracted in some part, so that the food could only be swallowed in small quantities, and with great difficulty. If the stricture be near the entrance into the stomach, there is no remedy, for the part cannot be got at. If it be higher up, a veterinary surgeon alone can determine how far relief is practicable. Substances have sometimes stuck in the gullet. Bran and chaff swallowed greedily, or too large or hard a ball, have remained in some part of the gullet, and caused very alarming symptoms. The tube used for the hove in cattle, will sometimes dislodge this foreign substance; but should this be impracticable, the gullet must be opened, which a scientific practitioner alone is competent to perform.

CHAPTER IV.

THE CHEST AND ITS CONTENTS—THE HEART AND THE LUNGS.

THE form of the chest is of the greatest importance. It contains the heart and the lungs;—the one employed in circulating the blood, and the other in restoring to it the power of supporting life; and on the size and the soundness of these organs, the health and the strength of the animal principally depend. The speed and wind of the horse are most intimately connected with the size of the lungs. In proportion to the quantity of air which they contain, and the less frequent necessity of renewing that air by the act of breathing, will the animal be at his ease, or distressed, when violent exertion is demanded of him. Therefore, one of the first things which the judge of the horse examines, is the capacity of the chest; and if he finds considerable depth in the girth, and roundness behind the point of the elbow;—the horse carrying what is called a good barrel;—he is satisfied as to the capacity of the chest. The form of the chest has as much to do with the value of the horse as its capacity. An ox may have a chest rounded before as well as behind, and then there will be room enough for the heart to circulate, and the lungs to purify sufficient blood to clothe him with all the muscle and fat he was intended to yield: we require from him no speed, and, therefore, his legs will not fail him, should too much weight be thrown on them, nor will he be disposed to stumble and fall. One principal quality of the horse, however, is his speed; and if undue weight be thrown before, his legs and feet will be battered, and injured, and worn out by the unavoidable concussion to which they will be exposed in the trot or the gallop; and likewise the centre or bulk of his weight will be too easily thrown beyond the natural situation of his feet, and he will be exceedingly unsafe. Therefore, for the light carriage and the saddle, although we want capacity of chest, we want it not too much before. A moderate breadth, with depth at the girth, and a swelling out, or barrelling behind the elbow, will be the most desirable form. Horses with narrow chests may have plenty of spirit, and willingness for work; but they have not the appetite or the endurance of those whose breast is moderately wide.

The heavy cart or dray horse, whose power of draught is equal to the weight which he can throw into the collar, requires the broad chest, not only that his weight may be thrown more before, but that by the increased capacity of his chest he may obtain that bulk and size which will enable him to press with the requisite force upon the collar.

Depth of chest has another advantage; it not only gives increased capacity to the cavity within it, but increased room for the insertion of those muscles on and between the ribs, by the action of which, the chest is alternately expanded and contracted in the act of breathing;

Dimensions
of the chest
best suited
for service.

and the action of which is so necessary when the breathing is quickened by exercise.

Again, depth of chest will admit of a great deal more increased expansion, than will a chest approaching to a circular form. That which is somewhat straight may be easily bent into a circle; but that which is already rounded can scarcely be made more so: therefore it is that the heavy horse, with all his capaciousness of chest, is easily blown, and incapable of speed, because all this expanse was employed in the accumulation of flesh and fat, and can be very little increased when exertion causes the flow and the change of blood to be considerably more rapid. The flatter chest may be readily expanded as the circumstances of the animal may require. A judge of the horse never likes to see a chest too high from the ground, and legs too long. The animal may be free and speedy, but there is not sufficient capacity of chest to render him a good feeder, or to give him much endurance.

The next point of consequence regarding the capacity of the chest, is the length or shortness of the carcass; or the extent of the ribs from the elbow backward. Some horses are what is called *ribbed home*; there is but little space between the last rib and the hip-bone. In others the distance is considerably greater, which is evident by the falling in of the flank. The question here is, what service is required from the horse? If he have to carry a heavy weight, and much work to do, let him be ribbed home,—let the last rib, and the hip-bone be close to each other. There is more capacity of chest and belly; there is less distance between the points of support; there is more strength and endurance. A hackney can scarcely be too well ribbed home.

If speed, however, be required, there must be room for the full action of the hinder limbs; and this can only exist when there is sufficient space between the last rib and the hip-bone. The owner of the horse must make up his mind as to what he wants from him, and be satisfied if he obtains that; but let him be assured that he cannot have every thing: this would require those differences of conformation which cannot possibly exist in the same animal.

THE SPINE AND BACK.

The spine or back-bone consists of a chain of bones from the poll to the extremity of the tail. We will now proceed to that portion of the spine which forms the roof of the chest and belly. It consists of twenty-three bones from the neck to the haunch; eighteen, called *dorsal vertebrae*, composing the back; and five *lumbar vertebrae*, occupying the loins. On this part of the animal the weight or burden is laid, and there are two principal things to be considered, easiness of carriage, and strength. If the back were composed of unyielding materials, if it resembled a bar of wood or iron, the jar or jolting, in the rapid motion of the animal, could not possibly be endured. To avoid this, as well as to assist in turning, the back is divided into numerous bones; and between each pair of bones, there is interposed a cartilaginous substance, most highly elastic, which will yield and give way to every

jar, not so much as to occasion insecurity between the bones, or to permit considerable motion between any one pair; yet forming altogether an aggregate mass of elasticity, so springy that the rider sits almost undisturbed, however high may be the action, or however rapid the pace.

Strength is as important as ease; therefore these bones are united together with peculiar firmness. The round head of one is exactly fitted to the cup or cavity of that immediately before it; and between them is placed the elastic ligamentous substance we have just described, so strong, that in endeavouring to separate the bones of the back, the bones will break sooner than this substance will give way. Beside this there are ligaments running along the broad under surface of these bones; ligaments between each of the *transverse* processes, or side projections of the bones; and ligaments between the *spinous* processes, or upright projections; and a continuation of the strong ligament of the neck running along the whole course of the back and loins above these, lengthening and contracting, as in the neck, with the motions of the animal, and forming a powerful bond of union between the bones.

By these means those shocks and jars are avoided which would be annoying to the rider, and injurious and speedily fatal to the horse.

These provisions, however, although adequate to common or even severe exertion, will not protect the animal from the consequences of brutal usage; and, therefore, if the horse be much overweighted, or violently exercised, or too suddenly pulled upon his haunches, these ligaments are strained:—inflammation follows;—and the ligament becomes changed to bone, and the joints of the back lose their elasticity and ease of motion; or rather in point of fact cease to exist. On account of the too hard service required from them, and especially before they have gained their full strength, there are few old horses, who have not some of the bones of the back or loins *anched*, united together by bony matter, and not by ligament. When this exists to any considerable extent the horse is not pleasant to ride; he turns with difficulty in his stall;—he is unwilling to lie down, or when down to rise again;—and he has a curious straddling action. Such horses are said to be *broken-backed*, or *chincked in the chine*.

Fracture of the bones of the back rarely occurs, on account of their being so strongly united by ligaments, and defended by muscular substance. If a fracture of these bones does happen, it is during the violent struggles after the horse has been cast for an operation.

The length of the back is an important consideration. A long-backed horse will be easy in his paces, because the increased distance between the fore and hind legs, which are the supports of the spine, will afford greater room for the play of the joints of the back. A long spring has much more play than a short one, and will better obviate concussion. A long-backed horse is likewise formed for speed, for there is room for him to bring his hinder legs more under him in the act of galloping, and thus more powerfully

Length of
back for good
saddle-horse.

propel or drive forward the body: but, on the other hand, a long-backed horse will be weak in the back, and easily overweighted. A long spring may be easily bent and broken. The weight of the rider, likewise, placed further from the extremities, will act with mechanical disadvantage upon them, and be more likely to strain them. A short backed horse may be a good hackney, and be able to carry the heaviest weight, and possess great endurance; but his paces will not be so easy, nor his speed so great, and he may be apt to overreach himself.

The comparative advantage of a long or short carcase depends entirely on the use for which the horse is intended. For general purposes the horse with a short carcase is very properly preferred. He will possess health and strength; for horses of this make are proverbially hardy. He will have sufficient ease not to fatigue the rider, and speed for every ordinary purpose. Length of back will always be desirable when there is more than usual substance generally, and particularly when the loins are wide, and the muscles of the loins large and swelling. The two requisites, strength and speed, will then probably be united.

The back should be depressed a little immediately behind the withers, and then continue in an almost straight line to the loins. This is the form most consistent with beauty and strength. Some horses have a very considerable hollow behind the withers. They are said to be *saddle-backed*. It seems as if a depression were purposely made for the saddle. Such horses are evidently easy goers, for this curve inward must necessarily increase the play of the joints of the back; but in the same proportion they must be weak and liable to sprain. To the general appearance of the horse, this defect is not in any great degree injurious; for the hollow of the back is uniformly accompanied by a beautifully arched crest.

A few horses have the curve outward. They are said to be *roach-backed*, from the supposed resemblance to the arched back of a roach. This is a very serious defect;—altogether incompatible with beauty, and materially diminishing the usefulness of the animal. It is almost impossible to prevent the saddle from being thrown on the shoulders, or the back from being galled;—the elasticity of the spine is destroyed;—the rump is badly set on;—the hinder legs are too much under the animal;—he is continually overreaching himself, and his head is carried awkwardly low.

THE LOINS.

The loins are attentively examined by every good horseman. They can scarcely be too broad and muscular. The strength of the back, and the strength of the hinder extremities, will depend materially on this. The breadth of the loins is regulated by the length of the transverse or side processes of that part. The bodies of the bones of the loins are likewise larger than those of the back; and a more dove-tailed kind of union subsists between these bones, than between those of the back. Every provision is made for strength here.

Form.

The union of the back and loins should be carefully remarked. There is sometimes a depression between them; a kind of line is drawn across which shows imperfection in the construction of the spine, and is regarded as an indication of weakness.

THE WITHERS.

The spinous or upright processes of the dorsal vertebræ, or bones of the back, above the upper part of the shoulder, are as remarkable for their length as are the transverse or side processes of the bones of the loins. They are flattened and terminated by rough, blunted extremities. The elevated ridge which they form is called the *withers*. The spine of the first bone of the back has but little elevation, and is sharp and upright. The second is longer and inclined backward, the third and fourth increase in length, and the fifth is the longest;—they then gradually shorten until the twelfth or thirteenth, which becomes level with the bones of the loins.

High withers have been always, in the mind of the judge of the horse, associated with good action, and generally with speed. The reason is plain enough:—they afford larger surface for the attachment of the muscles of the back; and in proportion to the elevation of the withers, these muscles act with greater advantage. The rising of the fore parts of the horse, even in the trot, and more especially in the gallop, depends not merely on the action of the muscles of the legs and shoulders, but on those of the loins, inserted into the spinous processes of these bones of the back, and acting with greater power in proportion as these processes, constituting the withers, are lengthened. The arm of the lever to which the power is applied will be longer; and we well know that in proportion to the length of this arm will be the ease with which a weight is raised. Therefore good and high action will depend much on elevated withers.

It is not difficult to understand how speed will likewise be promoted by the same conformation. The power of the horse is in his hinder quarters. In them lies the main spring of the frame, and the fore quarters are only elevated and thrown forward to receive the weight forced on them by the action of the hinder quarters. In proportion, however, as the fore-quarters are elevated, will they be thrown farther forward, or, in other words, will the stride of the horse be lengthened: they are elevated and thrown forward in proportion to the elevation of the withers, and therefore in this point of view the form of the withers is very much connected with speed.

Before we quite leave the roof of the chest, we will speak of some accidents or diseases to which it is exposed. The first is of a very serious nature.

FISTULOUS WITHERS.

When the saddle has been suffered to press long upon the withers, a tumour will be formed, hot and exceedingly tender. It may sometimes be dispersed by the cooling applications recommended in the treatment of poll-evil; but if, in despite of

Cause of
disease, and
remedy for.

these, the swelling should remain stationary, and more especially if it should become larger and more tender, warm fomentations and poultices and stimulating embrocations should be applied diligently to it, as to the tumour of poll-evil, in order to hasten the formation of matter. As soon as the matter can be fairly detected, a seton should be passed from the top to the bottom of the tumour, so that the whole of the matter may run out, and continue to run out as it is afterwards formed. The after treatment must be precisely that which we have recommended for a similar disease in the poll.

In neglected fistulous withers the ulcer may be larger and deeper, and more destructive than in poll-evil. It may burrow beneath the shoulder-blade, and the matter may appear at the point of the shoulder or the elbow; or the bones of the withers may become carious.

WARBLES, SITFASTS, AND SADDLE GALLS.

On other parts of the back, tumours and very troublesome ulcers may be produced by the same cause. The little tumours resulting from the pressure of the saddle are called *warbles*, and when they ulcerate they frequently become *sitfasts*. The ulcer has a portion of callous skin in the centre of it, resembling leather in its appearance, and so closely adhering as not to be separated without great force or absolute dissection; and hence the name given to this peculiar ulcer. Warbles are too often but little regarded. They will frequently disappear without medical treatment, but they will, at other times, degenerate into sitfasts. If it be practicable, the horse should have rest, or at all events, the stuffing of the saddle should be so contrived that every degree of pressure be removed from the part; then goulard and vinegar or brine should be frequently applied for the purpose of dispelling the enlargement. Should this prove ineffective, and the sitfast appear, let it by no means be torn out, but apply a mild blister which will cause it speedily to separate; and then let the wound be dressed with Friar's balsam, or Turner's cerate, or both.

For saddle galls there is no better application than strong salt and water, mixed with a fourth-part of tincture of myrrh. Common sense and common humanity would suggest the necessity of chambering the saddle and the collar, and not suffering the animal, with sore places as broad as the hand, to be unnecessarily tortured by the rubbing of the rough and hardened stuffing.

THE RIBS.

The ribs constitute the sides of the chest. They are usually eighteen on either side, and, in a few instances, nineteen or twenty. They are crooked or twisted in their figure, but so united to the spine by a true joint, the head of each rib being received between the bodies of two of the bones of the back, that they form so many arches, differing in roundness in different horses.

Between the ribs, and mainly contributing to their motion, are two layers of muscles, the *intercostals*. According as the ribs are brought

nearer to, or recede from each other, the cavity of the chest will be increased or diminished. These two layers are curiously contrived. If the fibres ran straight across from rib to rib, they would be exceedingly short, a short muscle could have but little contraction, and a very slight change of form or dimension could be produced. They run diagonally from rib to rib, and thus are more than double the length that they could otherwise have been; and so the degree of contraction is doubled, and the ribs are moved through a greater space. More perfectly to produce this effect, the muscular fibres of the outer layer run one way, and those of the inner layer a contrary, crossing each other in the form of an X. When these muscles contract, as they act from the fore ribs upon the hinder ones, although the ribs are brought nearer to each other, they are thrown outward, and the real effect is to expand, and not to contract the cavity of the chest. This is, perhaps, somewhat difficult to imagine, but it is the actual explanation of the matter. The ribs are drawn forward, and when so, they must be thrown outward, and the chest is necessarily expanded.

MUSCLES OF THE BREAST.

There are some important muscles attached to the breast, and therefore, every horse should have a breast tolerably expanded. A horse thin and narrow in the breast, must be deficient in important muscular power.

Between the legs and along the breast-bone is the proper place in which to insert rowels, in cases of inflamed lungs.

CHEST-FOUNDER.

The muscles in the chest are occasionally the seat of a singular and somewhat mysterious disease. The old farriers used to call it *anticor* and *chest-founder*. The horse has considerable stiffness in moving, evidently not referable to the feet. There is tenderness about the muscles of the breast, and occasionally swelling, and after a while, the muscles of the chest waste considerably. We believe it to be nothing more than rheumatism, produced by suffering the horse to remain too long tied up, and exposed to the cold, or riding him against a very bleak wind. Sometimes a considerable degree of fever accompanies this; but bleeding, physic, a rowel in the chest, warm embrocations over the parts affected, warm stabling, and warm clothing, with doses of a drachm or two of antimonial powder, will soon subdue the complaint.

DROPSY OF THE SKIN OF THE CHEST.

Dropsical swellings often appear between the fore-legs, and on the chest. They are effusions of fluid underneath the skin. They accompany various diseases, particularly when the animal is weakened by them, and sometimes appear when there is no other disease than the debility, which, in the spring and fall of the year, accompanies the changing of the coat. The treatment will vary with the cause of the

affection, or the accompanying disease. Small punctures with the lancet will seldom do harm;—friction of the part, if it can be borne, will be serviceable;—mild exercise should be used;—diuretics given, mixed with some cordial, with liberal food, as carrots, malt mash, and occasionally a very mild dose of physic, and that followed by tonics and cordials, with diuretics. The vegetable tonics, as gentian and columbo with ginger, will be most effectual.

The cavity of the trunk consists of two compartments, divided from each other by the *diaphragm* or *midriff*. The first, into which we have traced the gullet and the windpipe, contains the heart and the lungs. It is lined by a delicate membrane called the *pleura* (the side, or membrane of the side,) which likewise extends over and affords a covering to the lungs. A portion of it, dipping down from its attachment to the spine, separates the chest into two parts, each of which contains one of the lobes or divisions of the lungs; and this portion, the *mediastinum* (standing in the middle,) forms a kind of bag enveloping the heart. The use of this membrane is to throw out a fluid to moisten the different surfaces, and prevent all dangerous friction or rubbing between these important parts; and also, to support these organs in their natural situation.

THE HEART.

The heart is placed between a doubling of the pleura, and is likewise surrounded by a membrane or bag of its own, called the *pericardium* (about the heart.) This likewise throws out a fluid, for the purposes above mentioned. When the pericardium or the heart itself becomes inflamed, this secretion is much increased; and so much fluid accumulates as to obstruct the beating of the heart. This disease is called *dropsy of the heart*. It is not easily distinguished from inflammation of the lungs; but this is a matter of little consequence, for the treatment would be nearly the same in both.

The heart is the engine by which the blood is circulated through the frame. It is composed of four cavities, two above called auricles, from their supposed resemblance to a dog's ear, and two ventricles or little bellies, occupying the substance of the heart. The blood which has circulated through the frame, and nourished it, returns to the heart through the veins. It enters the auricle on the right side, where it accumulates as in a reservoir, until there is enough to fill the ventricle below. The auricle then contracts, and throws the blood into the ventricle. That contracts in its turn, and drives the blood, not back again into the auricle, for there is as complete a valve as that in the sucker of a pump to prevent this, but through an aperture that leads to the lungs. The blood traverses, as we shall presently see, all the little vessels and cells of the lungs, and undergoes an important change there, and is carried to the left auricle; thence it descends to the left ventricle, and by the powerful closing of the ventricle, is propelled into the arteries. The first artery, the aorta, rises from the left ventricle, and the blood, by the force communicated to it, by the sudden contraction of the ventricle

and assisted by the elastic power of the arteries which keeps them open and free from obstruction, and also by the pressure of the muscular and elastic coats, endeavouring to return to their former dimensions, pursues its course through every part of the frame.

The heart is subject to disease. It powerfully sympathises with the maladies of every part. An injury of the foot will speedily double the quickness of the beatings or pulsations of the heart. It sometimes is inflamed, without previous affection of any other part. This is not a frequent, but a most dangerous disease, and is characterised by a pulse quick and strong, and a bounding action of the heart that may occasionally be seen at the side, and even heard at the distance of several yards. There is also a peculiar alertness and quickness in every motion of the animal; and an energy of expression in the countenance exceedingly remarkable. Speedy and copious blood-letting will alone avail to save the horse; for the heart, over excited and called on to perform this double work, must soon be exhausted.

THE ARTERIES.

The vessels which carry the blood from the heart are called arteries (*keeping air*, the ancients thought that they contained air.) They are composed of three coats; the outer or elastic is that by which they are enabled to yield to the gush of blood, and enlarge their dimensions as it is forced along them, and by which also they contract again as soon as the gush of blood has passed; the middle coat is the muscular, by which this contraction is more powerfully performed, and the blood urged on in its course; the inner or membranous coat is the mere lining of the tube.

This yielding of the artery to the gush of blood, forced into it by the contraction of the heart, constitutes

THE PULSE.

The pulse is a very useful assistant to the practitioner of human medicine, and much more so to the veterinary surgeon, whose patient cannot describe either the seat or degree of ailment or pain. The number of pulsations in any artery will give the number of the beatings of the heart, and so express the irritation of that organ, and of the frame generally. In a state of health, the heart beats in the farmer's horse about thirty-six times in a minute. In the smaller, and in the thorough-bred horse, the pulsations are 40 or 42. This is said to be the *standard* pulse,—the pulse of health. It varies singularly little in horses of the same size and breed, and where it is found there can be little materially wrong. The most convenient place to feel the pulse, is at the lower jaw, a little behind the spot where the submaxillary artery and vein, and the parotid duct, come from under the jaw. There the number of pulsations will be easily counted, and the character of the pulse, a matter of fully equal importance, will be clearly ascertained. Many horsemen put the hand to the side. They can certainly count the pulse there, but

Place to feel
the pulse.

they can do nothing more. We must be able to press the artery against some hard body, as the jaw-bone, in order to ascertain the manner in which the blood flows through it, and the quantity that flows.

When the pulse reaches fifty or fifty-five, some degree of fever may be apprehended, and proper precaution should be taken. Seventy or seventy-five will indicate a somewhat dangerous state, and put the owner and the surgeon not a little on the alert. Few horses long survive a pulse of one hundred, for by this excessive action the energies of nature are speedily worn out.

Some things, however, should be taken into account in forming our conclusion from the frequency of the pulse. Exercise, a warm stable, and fear, will wonderfully increase the number of pulsations.

When a careless, brutal fellow goes up to a horse, and speaks hastily to him, and handles him roughly, he adds ten beats per minute to the pulse; and will often be misled in the opinion he may form of the state of the animal. A judicious person will approach the patient gently, and pat and soothe him, and even then the circulation, probably, will be little disturbed; and he should take the additional precaution of noting the number and quality of the pulse, a second time, before he leaves the animal.

If a *quick* pulse indicate irritation and fever, a *slow* pulse will likewise characterise diseases of an opposite character. It accompanies the sleepy stage of staggers, and every malady connected with deficiency of nervous energy.

The heart may not only be excited to more frequent, but also to more violent action. It may contract more powerfully upon the blood, which will be driven with greater force through the arteries, and the expansion of the vessels will be greater and more sudden. Then we have the *hard* pulse,—the sure indicator of considerable fever, and calling for the immediate and free use of the lancet.

Sometimes the pulse may be hard and jerking, and yet *small*. The stream though forcible is not great. The heart is so irritable, that it contracts before the ventricle is properly filled. The practitioner knows that this shews a dangerous state of disease. It is an almost invariable accompaniment of inflammation of the bowels.

A *weak* pulse, when the arterial stream flows slowly, is caused by the feeble action of the heart. It is the reverse of fever, and expressive of debility.

The *oppressed* pulse is when the arteries seem to be fully distended with blood; there is obstruction somewhere, and the action of the heart can hardly force the stream along, or communicate pulsation to the current. This is the case in sudden inflammation of the lungs. They are overloaded and gorged with blood, which cannot find its way through their minute vessels. This accounts for the well-known fact of a copious bleeding increasing a pulse previously oppressed. A portion being removed from the distended and choked vessels the remainder is able to flow on.

There are many other varieties of the pulse, which it would be tedious here to particularise, and we will conclude our remarks on it by observing, that, during the act of bleeding, its state should be carefully observed. Many veterinary surgeons, and gentlemen too, are apt to order a certain quantity of blood to be taken away, but do not condescend to superintend the operation. This is unpardonable in the surgeon, and censurable in the owner of the horse. The horse is bled for some particular purpose. There is some state of disease, indicated by a peculiar quality of the pulse, which we are endeavouring to alter. The most experienced practitioner cannot tell what quantity of blood must be abstracted to produce the desired effect. The change of the pulse can alone indicate when the object is accomplished; therefore, the operator should have his finger on the artery during the act of bleeding, and, comparatively regardless of the quantity, continue to take blood, until, in inflammation of the lungs, the oppressed pulse becomes fuller and more distinct, or the strong pulse of considerable fever is evidently softer, or the animal exhibits symptoms of faintness.

The arteries divide as they proceed through the frame, and branch out into innumerable minute tubes, termed capillaries (hair-like tubes,) and they even become so small as to elude the sight. The slightest puncture cannot be inflicted without wounding some of them.

In these little tubes, the nourishment of the body, and the separation of all the various secretions is performed, and, in consequence of this, the blood is changed; and when these capillaries unite together, and begin to enlarge, it is found to be no longer arterial, or of a florid red colour, but venous, or of a blacker hue. Therefore, the principal termination of the arteries is in veins. The point where the one ends, and the other commences, cannot be ascertained; it is when the red arterial blood, having discharged its function, is changed to venous or black blood; but this is a process gradually performed, and therefore the vessel is gradually changing its character.

Branches from the ganglial or sympathetic nerves wind round these vessels, and endue them with energy to discharge their functions. When the nerves communicate too much energy and these vessels consequently act with too much power, *inflammation* is produced. If this disturbed action be confined to a small space, or a single organ, it is said to be *local*, as inflammation of the eye, or of the lungs; when this inordinate action spreads from its original seat, and embraces the whole of the arterial system, *fever* is said to be present, and which usually increases in proportion as the local disturbance increases, and subsides with it.

INFLAMMATION.

Local inflammation is characterised by redness, swelling, heat, and pain. The redness proceeds from the increased quantity of blood flowing through the part, occasioned by the increased action of the vessels. The swelling arises from the same cause, and from the

deposit of fluid in the neighbouring substance. The natural heat of the body is produced by the gradual change which takes place in the blood, in passing from an arterial to a venous state. If more blood be driven through the capillaries of an inflamed part, and in which this change is effected, more heat will necessarily be produced there; and the pain is easily accounted for, by the distention and pressure which must be produced, and the participation of the nerves in the disturbance of the surrounding parts.

We have spoken of some of these local inflammations, and shall speak of others when describing the structure of the parts that are occasionally attacked by them. The treatment will in some degree vary with the part attacked, and the degree of the inflammation; but it will necessarily include the following particulars.

If inflammation consist of increased flow of blood to and through the part, the ready way to abate the inflammation is to lessen the quantity of blood. If we take away the fuel, the fire will go out. All other means are comparatively unimportant, compared with *bleeding*. Blood may be taken from the jugular, and so the general quantity may be lessened; but if it can be taken from the neighbourhood of the part, it will be productive of tenfold benefit. One quart of blood taken from the foot in acute founder, by unloading the vessels of the inflamed part, and enabling them to contract, and, in that contraction, to acquire tone and power to resist future distention, will do more good than five quarts taken from the general circulation. An ounce of blood obtained by scarifying the swelled vessels of the inflamed eye, will give as much relief as a copious bleeding from the jugular. It is a principle in the animal frame which should never be lost sight of by the veterinary surgeon, or the horseman, that if by bleeding the process of inflammation can once be checked,—if it can be suspended but for a little while,—although it may return, it never returns with the same degree of violence, and in many cases it is got rid of at once. Hence the necessity of bleeding early, and bleeding largely, in inflammation of the lungs, or of the bowels, or of the brain, or of any important organ. Many horses are lost for want of bleeding, or from insufficient bleeding, but we never knew one materially injured by the most copious abstraction of blood in the *early* stage of acute inflammation. The horse will bear, and with advantage, the loss of an almost incredible quantity of blood. Four quarts taken from him, will be comparatively little more than one pound taken from the human being. We can scarcely conceive a considerable inflammation of any part of the horse, either proceeding from sprains, contusions, or any other cause, in which bleeding, local (if possible) or general, or both, will not be of essential service.

Next in importance to bleeding is purging. Something may be removed from the bowels, the retention of which would increase the general irritation and fever;—the blood will be materially lessened, for the quantity of serous or watery fluid which is separated from it by a brisk purge, the action of which in the horse continues probably

for more than twenty-four hours, is enormous, and while the blood is thus determined to the bowels, less even of that which remains will flow through the inflamed part. When the circulation is directed to one set of vessels, it is proportionably diminished in other parts. It was first directed to the inflamed parts, and they were overloaded and injured: it is now directed to the bowels, and the inflamed parts are relieved. While the purging continues, there is also some degree of languor and sickness felt, and the force of the circulation is thereby diminished, and the general excitement lessened. The farmer will, therefore, see the importance of physic in every case of considerable external inflammation. If the horse is laid by for a few days from injury of the foot, or sprain, or poll-evil, or wound, or almost any cause of inflammation, a physic ball should be given.

In cases of internal inflammation, much judgment is required to determine when a purgative may be beneficial or injurious. In inflammation of the lungs or bowels it should never be given. There is so strong a sympathy between the various contents of the cavity of the chest, that no one of them can be inflamed to any great extent, without all the others being disposed to become inflamed; and, therefore, a dose of physic in inflamed lungs would be frequently as fatal as a dose of poison. The excitement produced on the bowels by the purgative will soon run on to inflammation, which no medical skill can stop.

The means of abating external inflammation are various and seemingly contradictory. The heat of the part very naturally and properly led to the application of cold embrocations and lotions. Heat has a strong tendency to equalize itself, or to leave that substance which has a too great quantity of it, or little capacity to retain it, for another which has less of it, or more capacity to retain it. Hence the advantage of cold applications, by which a great deal of unnatural heat is speedily taken away from the inflamed part. The foot labouring under inflammation is put into cold water; or the horse is made to stand in water or wet clay, and various cold applications are used to sprains. The part is wetted with diluted vinegar or goulard, or salt and water. We believe that when benefit is derived from these applications, it is to be attributed to their coldness alone, and that water, and when especially cooled below the natural temperature, is quite as good as any thing else. An ounce of nitre dissolved in a pint of water, will lower the temperature of the fluid many degrees; but the lotion must be applied immediately after the salt has been dissolved, and it should be applied in such a way that the inflamed part may be fully exposed to the process of evaporation. While the fluid is converted into vapour, by the heat of the skin, a considerable degree of cold is produced. Let the limb or the part have the full benefit of this, by being uncovered. A bandage may be afterwards applied to strengthen the limb, but during the continuance of active inflammation it will only confine the heat of the part, or prevent the part from benefiting by the salutary influence of the cold produced by the evaporation of the water.

Sometimes, however, we resort to warm fomentations, and if benefit be derived from their use, it is to be traced to the warmth of the fluid, and not to any medicinal property in it; and warm water will do as much good to the horse who has so thick a skin, as a decoction of chamomile, or marsh-mallow, or even of poppy heads, or any nostrum that the farrier may recommend. Fomentations increase the warmth of the skin, and open the pores of it, and promote perspiration, and so lessen the tension and swelling of the part, assuage pain, and relieve inflammation. Fomentations, to be useful, should be long and frequently employed, and at as great a degree of heat as can be used without giving the animal pain. Poultices are nothing but more permanent, or longer-continued fomentations. The part is exposed to the influence of warmth and moisture for many hours or days without intermission, and perspiration being so long kept up, the distended vessels will be very materially relieved. The advantage derived from a poultice is attributed to the heat and moisture, which, by means of it, can be long applied to the skin, and it should be composed of materials which will best afford this heat and moisture. The bran poultice of the farrier will therefore be objectionable. It is never perfectly in contact with the surface of the skin, and it becomes nearly dry in a few hours, and then is injurious. Linseed-meal is a much better material for a poultice; it will remain moist for twenty-four hours. The poultice is easily made by pouring hot water on the meal, a little at a time, and moulding it well with the hand until the cataplasm attains its proper consistence.

It is often very difficult to decide when a cold or hot application is to be used, and no general rule can be laid down, except that in cases of superficial inflammation, and in the early stage, cold lotions will be preferable; but when the inflammation is deeper seated, or fully established, warm fomentations may be most serviceable.

Stimulating applications are frequently used in local inflammation. We have shewn the action of a blister in hastening the suppuration of the tumour of strangles. When the inflammation is deeply seated, a stimulating application to the skin will cause some irritation and inflammation there, and lessen or sometimes remove the original one, hence the use of rowels and blisters in inflammation of the chest. Inflammation to a high degree cannot exist in parts so near to each other. If we excite it in one, we shall abate it in the other, and also by the discharge which we establish from the one, we shall lessen the determination of blood to the other.

With one caution we will dismiss this part of our subject; stimulating and blistering applications should never be applied to a part already inflamed. We shall not put out a fire by heaping more fuel upon it. Hence the mischief which the farrier often does by rubbing his abominable oils on a recent sprain, hot and tender. Many a horse has been ruined by this absurd treatment. When the heat and tenderness have disappeared by the use of cold lotions or fomentations, and the leg or sprained part remains enlarged, or even bony matter threatens to be

deposited, we may be justified in exciting inflammation of the skin by a blister, in order to rouse the deeper seated absorbents to action, and enable them to take up this deposit; but we would again state it as a principle that, except to hasten the natural process and effects of inflammation, a blister, or stimulating application, should, in the treatment of the horse, never be applied to a part already inflamed.

FEVER.

Fever is general increased arterial action, either without any local affection, or in consequence of the sympathy of the system with inflammation in some particular part.

The first is pure fever. Some have denied that it exists in the horse, but they must have been strangely careless observers of the diseases of that animal. The truth of the matter is, that the usual stable management and general treatment of the horse are so absurd, that various parts of him are rendered so liable to take on inflammation, that pure fever will exist but a very little time without degenerating into inflammation of these parts. The lungs are so weakened by the heated and foul air of the ill-ventilated stable, and by sudden changes from almost insufferable heat to intense cold; and the feet are so injured by hard usage and injudicious shoeing, that, sharing from the beginning in the general vascular excitement which characterises fever, they soon become excited far beyond other portions of the frame; and that which commenced as fever becomes inflammation of the lungs or feet. Pure fever, however, is sometimes seen, and runs its course as fever.

It begins frequently with a cold or shivering fit, although this is not essential to fever. The horse is dull, unwilling to move, with a staring coat, and cold legs and feet. This is succeeded by warmth of the body; unequal distribution of warmth to the legs; one hot, and the other three cold, or some unnaturally warm, and others unusually cold, although not the deathly coldness of inflammation of the lungs; the pulse quick, soft, and often indistinct; breathing somewhat laborious; but no cough, or pawing, or looking at the flanks. The animal will scarcely eat, and is very costive. While the state of pure fever lasts, the shivering fit returns at nearly the same hour every day, and is succeeded by the warm one, and that often by a very slight sweating one; and this goes on for several days until local inflammation appears, or the fever gradually subsides. No horse ever died of pure fever; if he is not destroyed by inflammation of the lungs, or feet, or bowels succeeding to the fever, he gradually recovers.

What we have said of the treatment of local inflammation will sufficiently indicate that which we should recommend in fever. Fever is general increased action of the heart and arteries, and therefore evidently appears the necessity for bleeding, regulating the quantity of blood taken by the degree of fever, and usually continuing to take it (the finger being kept on the artery) until some impression is made upon the system. The bowels should be gently opened, but the danger of inflammation of the lungs, and the uniformly injurious

consequence of purgation in that disease, will prevent the administration of an active purgative. One drachm and a half of aloes may be given morning and night with the proper fever medicine, until the bowels are slightly relaxed, after which nothing more of an aperient quality should be administered. Digitalis, emetic tartar, and nitre should be given morning and night, in proportions regulated by the circumstances of the case, and these should give way to white hellebore in doses of half a drachm twice in the day if symptoms of inflammation of the lungs should appear. The horse should be warmly clothed, but be placed in a cool and well-ventilated stable.

Symptomatic fever is generally increased arterial action, proceeding from some local cause. No organ of consequence can be long disordered or inflamed without the neighbouring parts being disturbed, and the whole system gradually participating in the disturbance. Inflammation of the feet or of the lungs never existed long as to any material extent, without being accompanied by some degree of fever.

The treatment of symptomatic fever should resemble that of simple fever, except that particular attention should be paid to the state of the part originally diseased. If the inflammation which existed there can be subdued, the general disturbance will usually cease.

The arteries terminate occasionally in openings on different surfaces of the body. On the skin they pour out the perspiration, and on the different cavities of the frame they yield the moisture which prevents friction. In other parts they terminate in glands, in which a fluid, essentially different from the blood is secreted or separated from it: such are the parotid and salivary glands, the kidneys, the spleen, and the various organs or laboratories which provide so many, and such different secretions, for the multifarious purposes of life; but the usual termination of arteries is in veins.

THE VEINS.

These vessels carry back to the heart the blood which had been conveyed to the different parts by the arteries. They have but two coats, a muscular and a membranous; both of them are thin and comparatively weak. They are more numerous and much larger than the arteries, and consequently the blood, lessened in quantity by the various secretions separated from it, flows more slowly through them. It is forced on partly by the first impulse communicated to it by the heart; partly, in the extremities and external portions of the frame, by the pressure of the muscles; and in the cavity of the chest, its motion is assisted or principally caused by the sudden opening of the ventricles of the heart, after they have closed upon and driven out their contents, and thereby causing a vacuum which the blood rushes on to fill. There are curious valves in the veins which prevent the blood from flowing backward.

BOG AND BLOOD SPAVIN.

The veins of the horse, although their coats are thin compared with those of the arteries, are not subject to the enlargements (varicose veins) which are so frequent, and often so painful, in the legs of the human being. The legs of the horse may exhibit many of the injurious consequences of hard work, but the veins will, with one exception, be unaltered in structure. Attached to the extremities of most of the tendons, and between the tendons and other parts, are little bags containing a mucous substance to enable the tendons to slide over each other without friction, and to move easily on the neighbouring parts. From violent exercise these little bags are liable to enlarge. Windgalls and thoroughpins are instances of this. There is one of them on the inside of the hock at its bending: this sometimes becomes considerably increased in size, and the enlargement is called a *bog-spavin*. A vein passes over this bag, which is pressed between the enlargement and the skin, and the passage of the blood through it is impeded; the vein is consequently distended by the accumulated blood, and the distension reaches from this bag as low down as the next valve. This is called a *blood-spavin*. Blood-spavin then is the consequence of bog-spavin. It very rarely occurs, and is, in the majority of instances, confounded with bog-spavin.

Blood-spavin does not always cause lameness, except the horse is very hard worked, and then it is doubtful whether the lameness should not be attributed to the enlarged mucous bag rather than to the distended vein. Both of these diseases, however, render a horse unsound, and materially lessen his value.

Old farriers used to tie the vein, and so cut off altogether the flow of the blood. Some of them, a little more rational, used to dissect out the bag which caused the distension of the vein: but the modern and more prudent way is to endeavour to promote the absorption of the contents of the bag. This may be attempted by pressure long applied. A bandage may be contrived to take in the whole of the hock except its point; and a compress made of folded linen being placed on the bog-spavin, may confine the principal pressure to that part. It is, however, very difficult to adapt a bandage to a joint which admits of such extensive motion; therefore most practitioners apply two or three successive blisters over the enlargement, when it usually disappears; but unfortunately it returns again if any extraordinary exertion is required from the horse.

BLEEDING.

The veins are selected in preference to the arteries for the purpose of bleeding, because they are more superficial and larger, and blood can be more easily and certainly procured from them, and the flow of the blood can be more easily stopped.

This operation is performed with a fleam or a lancet. The first is the common instrument, and the safest, except in skilful hands. The

lancet, however, has a more surgical appearance, and will be adopted by the veterinary practitioner. A bloodstick, a piece of hard wood loaded at one end with lead, is used to strike the fleam into the vein. This is sometimes done with too great violence, and the opposite side of the coat of the vein is wounded. Bad cases of inflammation have resulted from this. If the fist be doubled, and the fleam is sharp and is struck with sufficient force with the lower part of the hand, the bloodstick may be dispensed with.

For general bleeding the jugular vein is selected. The horse is blindfolded on the side on which he is to be bled, or his head turned well away; the hair is smoothed along the course of the vein with the moistened finger; then with the third and little fingers of the left hand, which holds the fleam, pressure is made on the vein sufficient to bring it fairly into view, but not to swell it too much, for then, presenting a rounded surface, it would be apt to roll or slip under the blow. The point to be selected is about two inches below the union of the two portions of the jugular at the angle of the jaw. The fleam is to be placed in a direct line with the course of the vein, and over the precise centre of the vein, as close to it as possible, but its point not absolutely touching the vein. A sharp rap with the bloodstick or the hand on that part of the back of the fleam immediately over the blade, will cut through the vein, and the blood will flow. A fleam with a large blade should always be preferred, for the operation will be materially shortened, which will be a matter of some consequence with a fidgety or restive horse; and a quantity of blood drawn speedily will have far more effect on the system than double the weight slowly taken; while the wound will heal just as readily as if made by a smaller instrument. There is no occasion to press so hard against the neck with the pail, or can, as some do; a slight pressure, if the incision has been large enough, and straight, and in the middle of the vein, will cause the blood to flow sufficiently fast; or the finger being introduced into the mouth between the tushes and the grinders, and gently moved about, will keep the mouth in motion, and hasten the rapidity of the stream by the action and pressure of the neighbouring muscles.

When sufficient blood has been taken, the edges of the wound should be brought closely and exactly together, and kept together by a small, sharp pin being passed through them. Round this a little tow, or a few hairs from the mane of the horse, should be wrapped, so as to cover the whole of the incision; and the head of the horse should be tied up for several hours to prevent his rubbing the part against the manger. In bringing the edges of the wound together, and introducing the pin, care should be taken not to draw the skin too much from the neck, otherwise blood will insinuate itself between the skin and the muscles beneath, and cause an unsightly and sometimes troublesome swelling.

The blood should be received into a vessel the dimensions of which are exactly known, so that the operator may be able to calculate at every period of the bleeding the quantity that is subtracted. Care

likewise should be taken that the blood flow in a regular stream into the centre of the vessel, for if it be suffered to trickle down the sides, it will not afterwards undergo those changes by which we partially judge of the extent of inflammation. The pulse, however, and the symptoms of the case collectively, will form a better criterion than any change in the blood. Twenty-four hours after the operation, the edges of the wound will have united, and the pin should be withdrawn. When the bleeding is to be repeated, if more than three or four hours have elapsed, it will be more prudent to make a fresh incision rather than to open the old wound.

Few directions are necessary for the use of the lancet. They who are competent to operate with it, will scarcely require any. Directions for using the lancet. If the point be sufficiently sharp the lancet can scarcely be too broad shouldered; and an abscess lancet will generally make a freer incision than that in common use. A spring lancet has lately been invented by Mr. Weiss in the Strand, by which any one may bleed from the jugular, or from a smaller vein safely and certainly. Whatever instrument be adopted, too much care cannot be taken to have it perfectly clean, and very sharp. It should always be most carefully wiped and dried immediately after the operation, otherwise in a very short time the edges will begin to be corroded.

For general bleeding the jugular vein is selected as the largest superficial vein, and most easily got at. In every affection of the head, and in cases of fever or extended inflammatory action, it is decidedly the best place for bleeding. In local inflammation blood may be taken from any of the superficial veins. In supposed affections of the shoulder, or of the fore-leg or foot, the *plate* vein, which comes from the inside of the arm, and runs upwards directly in front of it towards the jugular, may be opened. In affections of the hinder extremity, blood is sometimes abstracted from the *saphæna*, or thigh vein, which runs across the inside of the thigh. In foot cases it may be taken from the coronet, or, much more safely, from the toe; not by cutting out, as the farrier does, a piece of the sole at the toe of the frog, which sometimes causes a wound difficult to heal, and followed by festering, and even by canker; but cutting down with a fine drawing-knife, called a searcher, at the union between the crust and the sole at the very toe until the blood flows, and, if necessary, encouraging its discharge by dipping the foot in warm water. The mesh-work of both arteries and veins will be here divided, and blood is generally obtained in any quantity that may be needed. The bleeding may be stopped with the greatest ease, by placing a bit of tow in the little groove that has been cut, and tacking the shoe over it.

THE LUNGS.

The chest, likewise, contains the lungs, most important from the office which they discharge, and the diseases to which they are liable. There are two lungs, the right and the left, separated from each other by the mediastinum. The right lung is larger than the left, because

the heart, inclining to the left, leaves less room on that side of the chest. Each of the lungs is likewise partially divided into lobes; the right lung contains three, and the left two. When the windpipe enters the chest, it divides into two parts, one going to each lung; and when these reach the substance of the lungs, they separate into innumerable branches, each terminating in a little bag or cell. These branches, with the cells attached to them, bear no slight resemblance to bunches of minute grapes. Around these cells spread countless blood-vessels, being the extreme ramifications of those which conveyed the blood from the right side of the heart to the lungs, and the commencement of those which carry it back from the lungs to the left side of the heart; and the cells and the blood-vessels are connected together by an intervening substance of a fibrous and cellular texture.

The office of the lungs may be very shortly stated. The blood passing through the capillaries of the body, and contributing to the nourishment of the frame, and furnishing all the secretions, becomes, as we have described, changed. It is no longer able to support life: it is possessed of a poisonous principle, and that principle is a superabundance of a substance called *carbon*, which must be got rid of before the blood can again be usefully employed. There is an ingredient in the atmospheric air called *oxygen*, which has a strong attraction for this carbon, and which will unite with it wherever it finds it. The chest enlarges by the action of the diaphragm, and the intercostal and other muscles, as we have narrated; and the lungs expanding with the chest, in order to fill up the vacuum which would otherwise exist between them and the sides of the chest, these cells enlarge, and a kind of vacuum is formed in each of them, and the air rushes down and fills them, and being divided from the venous and poisoned blood by these membranes alone, it is enabled to act upon the blood, and attracts from it this carbon, and thus purifies it, and renders it arterial blood, and fit for the purposes of life. This being accomplished, the chest contracts, and the lungs are pressed into smaller compass, and a portion of the air, impregnated with the carbon, and rendered poisonous in its turn, is squeezed out. Presently the chest expands again, and the lungs expand with it, and fresh pure air is admitted, which is shortly pressed out again, empoisoned by the carbon of the blood; and these alternate expansions and contractions constitute the act of breathing.

When the animal powerfully exerts himself, a more ample supply of pure blood is required to sustain the energies of life, and the action of the muscles forces the blood more rapidly through the veins; hence the quick and deep breathing of a horse at speed; hence the necessity of a capacious chest, in order to yield an adequate supply, and the connexion of this capacity of the chest with the speed and the endurance of the horse; hence the wonderful relief which the mere loosening of the girths affords to a horse blown and distressed, enabling the chest to expand and to contract to a greater extent, in order to yield more purified blood; and hence the relief afforded by even a short period

of rest, during which this expenditure is not required, and the almost exhausted energies of these organs have time to recover. Hence, likewise, appears the necessity of an ample chest for the accumulation of much flesh and fat; for, if a considerable portion of the blood be employed in the growth of the animal, and it be thus rapidly changed, there must be provision for its rapid purification, and that can only be effected by the increased bulk of the lungs, and the corresponding largeness of the chest to contain them.

The diseases of these organs are among the most serious to which the horse is exposed, and interfere most with his usefulness.

Diseases. A glandered horse may be, and often is too long employed in our service; a blind horse, under the guidance of the driver, may employ both his strength and his speed for our benefit; but a horse with diseased lungs is worth nothing at all, and hence some of the difficulties with which the veterinary practitioner has to struggle. A surgeon who practises on the human body will obtain the gratitude of his patient, if he so far removes a severe affection as to enable him to live on with a certain degree of comfort, although his activity and his power of exertion may be considerably impaired; but the veterinary surgeon is thought to have done nothing, unless he renders the animal perfectly sound—unless, in fact, he does that which it is absolutely impossible to accomplish.

INFLAMMATION OF THE LUNGS.

There is no animal among all those whom we have subdued that previous to his breaking in, is so free from disease as the horse; there is no animal which, after he has been enlisted in our service, is so liable to disease, and especially of the lungs. How do we account for this? Few things can be more injurious to the delicate membrane that lines the cells of the lungs, than the sudden change from heat to cold to which, under the usual stable management, the horse is subject. In the spring and autumn, the temperature or heat of most stables is several degrees higher than that of the open air; in winter it is frequently more than thirty degrees. The necessary effect of this must be to weaken and exhaust the energies of the parts most exposed to the influence of these changes, and they are the lungs. It is, however, not only heated but empoisoned air that the horse respire;—composed of his own contaminated breath, and of vapours from his dung, and particularly from his urine, strongly impregnated with hartshorn, painful to the eyes and irritating to the chest.

There is likewise an intimate connexion between the lungs and the functions of the skin. When the insensible perspiration is suddenly stopped, cold and cough are the first consequences. What must inevitably happen to the horse that stands, twenty hours out of the four and twenty, in a heated atmosphere, and stands there warmly clothed, and every pore of his skin opened, and the insensible perspiration, and the sensible too, profusely pouring out, and then, with his coat stripped from his back, is turned shivering into a nipping winter's air?

The discharge from the skin is at once arrested, and the revulsion, or pernicious effect of the sudden stoppage of a natural evacuation, falls on the lungs, too much weakened, and disposed to inflammation by heated air and poisonous fumes.

These simple observations are pregnant with interest and instruction to all connected with horses. He who would have his stud free from disease, and especially disease of the lungs, must pursue two objects, coolness and cleanliness. In the gentleman's stable, the first of these is studiously avoided, from the prejudice or the idleness of the groom, and from these stables proceed most of the cases of inflamed lungs; especially when this heat is combined with that temporary but mischievous nuisance, the repeated breathing of the same air during the night, and that air more vitiated by the fumes of the dung and urine. In the stables of the post-rider, where not only closeness and heat, but the filth that would not be endured in a gentleman's establishment, are found, both inflammation of the lungs and glanders prevail; and in the stables of many agriculturists, cool enough from the poverty or the carelessness of the owner, but choked with filth, inflammation of the lungs is seldom seen, but mange, glanders, and farcy abound.

Inflammation of the substance of the lungs is sometimes sudden in its attack, but generally preceded by symptoms of fever.

Symptoms. The pulse is occasionally not much increased in frequency, but oppressed and indistinct; the artery is plainly to be felt under the finger, and of its usual size, but the pulse no longer indicates the expansion of the vessel, as it yields to the gush of blood, and its contraction when the blood has passed; it is rather a vibration or thrill, communicated to a fluid already over-distending the artery; in a few cases, even this almost eludes the most delicate touch, and scarcely any pulsation is to be detected. The extremities are cold;—the nostril is expanded;—the head thrust out, and the flanks begin to heave. There is a peculiarity in the working of the flank. It is not the deep laborious breathing of fever, nor the irregular beating of the broken wind, in which the air appears to be drawn in by one effort, while two seem to be necessary to expel it; but it is a quick hurried motion, evidently expressive of pain, and of inability to complete the action, on account of the pain, or of some mechanical obstruction. The membrane of the nose is of an intensely florid red—more vivid in the inside corners of the nostrils, and remaining concentrated there if at times it should seem to fade away higher up. The countenance is singularly anxious, and indicative of suffering, and many a mournful look is directed at the flanks. The horse stands in a singular manner, stiff, with his forelegs abroad, that the chest may be expanded as much as possible and he is unwilling to move, lest for a moment he should lose the assistance of the muscles of the arms and shoulders, in producing that expansion; and, for the same reason, he obstinately stands up day after day, and night after night; or if he lies down from absolute fatigue, it is but for a moment.

In many instances, however, the approach of the disease is very treacherous, and the most careful practitioner may be deceived. The groom may perceive that the horse is somewhat off his feed, and dull, but he pays little attention to it; or if it arrests his notice, he only finds that the coat stares a little, that the legs are colder than usual, and the breathing in a slight degree quickened and shortened. In other cases, the symptoms are those of common fever, catarrh, or distemper; and the characteristics of true inflammation of the lungs appear late and unexpectedly. The cold leg and ear, the quickened, not deepened inspiration, the disinclination to lie down, and the anxious countenance, will always alarm the experienced observer.

Whatever may be the state of the pulse at first, it soon becomes oppressed, irregular, indistinct, and at length almost imperceptible. The heart is labouring in vain to push on the column of blood with which the vessels are distended, and the flow of which is obstructed by the clogged-up passages of the lungs. The legs and ears, which were cold before, become more intensely so—it is a clayey, deathly coldness. The mouth soon participates in it, and the breath too. The bright red of the nostril fades away, or darkens to a livid purple. The animal grinds his teeth. He still persists in standing, although he often staggers and almost falls; at length he drops, and after a few struggles dies.

The duration of the disease is singularly uncertain. It will occasionally destroy in less than twenty-four hours, and then the lungs present one confused and disorganised mass of blackness, and would lead the inexperienced person to imagine that long inflammation had gradually so completely broken down the substance of the lungs. Such a horse is said to die rotten, and many attempts have been made to prove that he must have been unsound for a great while, and probably before he came into his last owner's possession, and some expensive law-suits have been instituted on this ground. Let our readers, however, be assured, that this black, decomposed appearance of the lungs proves no disease of long standing, but inflammation intense in its nature, and that has very speedily run its course. The horse has died from suffocation, every portion of the lungs being choked up with this black blood, which has even broken into and filled all the air-cells by means of which it should have been purified.

More frequently the disease lasts a little longer. The lungs are sufficiently pervious for some blood to be transmitted; but the inflammation is too great to be subdued, or proper means have not been taken to subdue it; and it runs its usual course, and proceeds to actual mortification, and the lungs are found not only black, but putrid. This, too, would prove recent and violent inflammation, and not any old and unsuspected disease. This termination would be indicated, a day or two before the death of the animal, by the stinking breath, and the offensive discharge from the nose.

A frequent, and to the practitioner and the owner a most annoying

termination of inflammation of the lungs, is dropsy in the chest. The disease seems to be subdued; the horse is more lively; his appetite returns; his legs and ears become warm; and those about him are deceived into the belief that he is doing well: nay, the most skilful surgeon is sometimes deceived. The anxiety to save his patient makes him hope the best, although the coat continues unhealthy, there is a yellow discharge from the nostrils, the pulse is irregular, and the horse is frightened if suddenly moved, and especially if his head be considerably raised in the act of drenching, and he rarely or never lies down. Many days or some weeks will pass on, with these contradictory and unsatisfactory appearances; and a judgment of the result can only be formed by balancing them against each other. At length the patient shivers, the old symptoms return, and he very soon dies. On opening him, both sides of the chest are found nearly filled with fluid, impeding the pulsation of the heart, and the expansion of the lungs, and destroying the horse by suffocation.

Although the life of the horse may be saved, the consequences of inflammation of the lungs may often materially lessen, or even destroy the usefulness of the animal. As in many external inflammations considerable thickening of the part long remains, so a deposit of the coagulable portion of the blood may be left in the substance of the lungs, occupying the place of many of the air-cells, and preventing the contraction and closing of others. This produces the peculiarity of breathing, almost incompatible with speed or continuance, called *thick wind*; and frequently precedes *broken wind*, when, from the violent action of the lungs, and that action thus impeded by the obstruction we have described, some of the air-cells become ruptured. Too frequently, considerable irritability remains in the membrane lining the air-cells, and in other portions of the air-passages, and a cough is established, which, from its continuance, and the difficulty of its removal, is called *chronic cough*. We have already considered inflammation of the lungs, as one of the causes of *roaring*.

The treatment of inflammation of the lungs must evidently be of the most decisive kind. We have to struggle with a disease intense in its character, and we must attempt radically to cure, and not merely to palliate it. We must look to the future usefulness of the horse, and not to the possibility of his being enabled to drag on an existence almost uncomfortable to himself. Supposing the attack to have just commenced, the horse should be bled, not only until the pulse begins to rise, but until it afterwards begins to flutter or to stop, or the animal is evidently faint. The effect of the bleeding, and not the quantity of the blood taken, should be regarded; for the inflammation being subdued, the lost blood will soon be supplied again. This is one of the cases in which it is absolutely necessary that the surgeon, or the owner, should stand by with his finger on the pulse, and mark the effect that is produced. If, six hours afterwards, the horse continues to stand stiff, and heaves as quickly and as laboriously as before, and the legs are as intensely cold, and the

membrane of the nose as red, the bleeding should be repeated, until the same effect again follows. In the majority of cases the inflammation will be now subdued. A third bleeding may, however, sometimes be necessary, but must not be carried to the same extent, for it is possible, by too great evacuation of blood, to subdue not merely the disease, but the powers of nature. If, after this, the legs become cold, and the heaving returns, and the membrane of the nose reddens, and the horse persists in standing, bleedings to the extent of two or three quarts will be advisable, to prevent the re-establishment of the disease. In all these bleedings, let not the necessity of a broad shouldered fleam or lancet, and a full stream of blood be forgotten. These are circumstances of far more importance than is generally imagined. The appearance of the blood will be some guide in our treatment of the case. The thickness of the adhesive buffy, yellow-coloured coat, which in a few hours will appear on it, will mark with some degree of accuracy the extent of the inflammation. Not regardless of the appearance of the blood, but not putting too much faith in it, we must look to the horse to determine how far that inflammation may have been diminished, or a repetition of the bleeding be necessary.

When the bleeding has evidently taken effect, we must consider by what means we may further abate, or prevent the return of the inflammation. We should blister the whole of the brisket, and the sides, as high up as the elbows. *Blisters* are far preferable to *rowels*. They act on a more extensive surface; they produce a great deal more inflammation; and they are speedier in their action.

To ensure the full operation of the blister, the hair must be closely shaved, and an ointment composed of one part of powdered Spanish flies, and four of lard and one of resin, well rubbed in. The lard and the resin should be melted together, and the powdered flies afterwards added.

To form a rowel, the skin is raised between the finger and thumb, and, with a lancet, or with scissors contrived for the purpose, a slit is cut an inch in length. Into this a piece of tow is inserted, sufficient to fill it, and previously smeared with blister ointment. This causes considerable inflammation and discharge. If a little of the tow be left sticking out of the incision, the discharge will conveniently dribble down it. The tow should be changed every day, with or without the ointment, according to the action of the rowel, or the urgency of the case. The large piece of stiff leather, with a hole in its centre, used by the farrier, is objectionable, as not being easily changed, and frequently, in the extraction of it tearing the skin so as to cause a lasting blemish.

The blister sometimes will not rise. It will not when the inflammation of the chest is at its greatest intensity: too much action is going on there, for any to be excited elsewhere. The blister occasionally will not act in the later stages of the disease, because the powers of nature are exhausted. It is always a most unfavourable symptom when the blisters or the rowels do not take effect. The best time for

the application of the blister, is when the inflammation is somewhat subdued by the bleeding; and then by the irritation which it excites, and in a part so near the original seat of disease, the inflammation of the chest is either abated or transferred to the skin; for, as we have before observed, it is an important law of nature, that no two violent actions of different kinds can take place in the frame at the same time.

Next comes the aid of medicine. If the patient was a human being the surgeon would immediately purge him. We must not do this: for from sympathy between the bowels and the lungs in the horse, we should either produce a fatal extension of inflammation, or a transferring of it in a more violent form, and the horse would assuredly die. We must back-rake, administer clysters, or perhaps give eight ounces of Epsom salts, dissolved in warm gruel. No castor-oil must be given. It may be a mild and a safe aperient for the human being: it is a very dangerous one for the horse.

Having a little relaxed the bowels, we eagerly turn to cooling or sedative medicines. The farrier gives his cordial to support the animal, and prevent rottenness. He adds fuel to the fire, and no wonder that the edifice is frequently destroyed. Nitre, digitalis, and emetic tartar, should be given in the doses already recommended, and persisted in until an intermittent state of the pulse is produced. Many practitioners give hellebore in doses of half a drachm, or two scruples, every six or eight hours, and they say with considerable advantage. It is continued until the horse hangs his head, and saliva drivels from his mouth, and he becomes half stupid, and half delirious. These symptoms pass over in a few hours, and the inflammation of the chest is found to be abated. If it be so, it is on the principle of the blister: the determination of blood to the head, and the temporary excitement of the brain or its membranes, divert the inflammation or a portion of it, from its original seat, and give time for the parts somewhat to recover their tone. We confess that we prefer the digitalis, emetic tartar, and nitre: they considerably lower the pulse, and are safe.

It is of importance that we determine the blood, or a portion of it, from the inflamed and over-distended part to some other region. On this principle we warmly clothe the horse labouring under this disease, that we may cause the blood to circulate freely through the vessels of the skin, and that we may keep up the insensible perspiration, and perhaps produce some sweating. But do we put the horse in a warm place? No; for then we should bring the heated and poisoned air in contact with the inflamed lungs, and increase the excitement, already too great. It is an absurd practice to shut up every door and window, and exclude, if possible, every breath of air;—rather let every door and window be thrown open, and let pure and cold air find access to these heated parts. It is interesting to see how eagerly the horse avails himself of the relief which this affords him. If no direct draft blows upon him, he can scarcely be placed in too cool a box (stall.)

Now and then the whole skin of the horse may be rubbed with the

brush, if it does not tease and hurry him; but it is indispensable that the legs should be frequently and well hand-rubbed to restore the circulation in them, and they should be covered with thick flannel bandages. As to food, we do not want him to take any at first, and most certainly the horse should not be coaxed to eat. A very small quantity of hay may be given to amuse him, or a cold mash, or green meat (food,) but not a particle of corn.

In eight-and-forty hours the fate of the patient will generally be decided. If there be no remission of symptoms, the inflammation will run on to congestion of the lungs, and consequent suffocation, or to gangrene. We must, in this case, give the medicines more frequently; repeat the blister; bleed, if the state of the animal will bear it; and rub the legs or even scald them. If the strength now rapidly declines, the horse may be drenched with gruel, and tonic medicine may be tried, as chamomile at first, and, this not recalling or increasing the fever, a little ginger and gentian may be added.

Should the heaving gradually subside, and the legs get warm, and the horse lie down, and the inflammation be apparently subsiding, let not the owner or the practitioner be in too great haste to get the animal well. Nature will slowly, but surely and safely, restore the appetite and strength; and it is very easy to bring back the malady in all its violence by attempting to hurry her. The food should be the same, cold mashes, green meat, or a little hay, if green meat cannot be procured, and thin gruel drunk from the pail—not given as a drench. Should the horse be very weak, or scarcely eat, tonics may be tried. The way should be felt very cautiously with the chamomile, and the sedative medicine again be immediately resorted to if there be the slightest return of fever. To the chamomile, the gentian and ginger may be gradually added, but no mineral tonic. After a while, hay may be offered, and a little corn, and the horse be suffered very gradually to return to his former habits.

The causes of inflammation of the lungs are changes from cold to heat, or heat to cold; exposure to cold while the horse is hot; washing with cold water immediately after exercise; sudden exposure to cold, after coming from a very hot stable; travelling in the face of a cold wind; the transference of general fever to the lungs previously disposed to inflammation from the usual stable management; and neglected catarrh, or catarrh treated with stimulants instead of cooling medicines. Any change from heat to cold, or from cold to heat, will produce it with almost equal certainty; the removal from a warm stable to a cold one, or from a cold one to a warmer; from grass to the stable, and from the stable to grass will equally give rise to disease of the lungs. It is generally the effect of our erroneous system of management.

We shall presently state the symptoms by which inflammation of the lungs may be distinguished from catarrhal fever. It may be distinguished from inflammation of the bowels by the pulse, which, in the latter disease, is small and wiry;—by the

Causes of
the disease.

How distin-
guished.

membrane of the nose, which is not then so much reddened;—by the indications of pain, as kicking at the belly, stamping, and rolling; by his eager scraping of the litter, and by the belly being painful to the touch, and also hot, when the bowels are inflamed.

PLEURISY.

Hitherto we have spoken of inflammation of the substance of the lungs; but inflammation may attack the membrane covering them and lining the side of the chest (*the pleura*), and be principally or entirely confined to that membrane. This is termed PLEURISY. The causes are the same as in inflammation of the substance of the lungs, and the symptoms are not very dissimilar. The guiding distinction will be the pulse. As the blood in this disease still traverses the lungs without obstruction, we have not the oppressed pulse, but rather the hard, full pulse, characteristic of inflammation; the extremities are cold, but not much so; the membrane of the nose intensely red in the former disease, because it is a continuation of the inflamed lining of the air cells of the lungs, is here but little reddened, because there is no connexion between them; if the sides are pressed upon in pleurisy, pain will be felt, which the horse will express by a kind of grunt, and which is easily explained by the pressure being applied so close to the seat of disease. The manner of standing, however, will remain the same, and the obstinacy of standing the same, and the extension of the neck, and the protrusion of the nostril. After death the pleura of the ribs and the lungs will exhibit stripes or patches of inflammation, and the chest will be generally filled with serous fluid.

Copious bleeding is indicated here, as in inflammation of the substance of the lungs. Blisters and sedative medicines must likewise be resorted to. The only important difference is, that aperients may be administered with more safety than in the former disease. Puncturing of the chest to give escape to the fluid that is thrown out in it may be attempted. It cannot do harm, but it has very seldom saved or much prolonged the life of the animal. If the operation be attempted, it should be as soon as the presence of the fluid is suspected, and the means by which this may be ascertained we have already described. The opening should be effected with the common trochar used for tapping in dropsy in the human being, and should be made between the eighth and ninth ribs, and close to the cartilages. Diuretic medicines combined with tonics should be administered.

CATARRH, OR COMMON COLD.

This is a complaint of frequent occurrence, generally subdued without much difficulty, but often becoming of serious consequence if neglected. It is accompanied by a little increase of pulse; a slight discharge from the nose and eyes; a coat somewhat roughened; a diminution of appetite, and cough sometimes painful and frequent. A little warmth, a few mashes, and some doses of the medicine recommended under inflammation of the lungs, will speedily effect a cure.

Should the cough be very painful and obstinate, it may be necessary to bleed; but then the disease is degenerating into bronchitis or catarrhal fever.

The divisions of the windpipe just before it enters the lungs, and the numerous vessels into which it immediately afterwards branches out, are called the *bronchial tubes*, and inflammation of the membrane that lines them is termed

BRONCHITIS.

It is catarrh extending to the entrance of the lungs. It is characterised by quicker and harder breathing than catarrh usually presents, and by a peculiar wheezing, which is relieved by the coughing up of mucous.

It is to be treated by bleeding, far less copious than in inflammation of the lungs, or even in catarrh. The horse will bear to lose only a very small quantity of blood when labouring under inflammation of the bronchial passages. The chest should be blistered, and digitalis given, and the other treatment similar to that for inflamed lungs, with the exception of the bleeding. Thick wind is a frequent consequence of neglected bronchitis.

CATARRHAL FEVER.

This malady has various names among horsemen, as *epidemic catarrh*, *influenza*, *distemper*. By the latter name it is generally distinguished in racing stables. It usually commences, like inflammation of the lungs and fever, with a shivering fit; to which rapidly succeed a hot mouth, greater heat of the skin than is natural, heaving of the flanks, and cough. The eyes are red and heavy, and the membrane of the nose red, but considerably paler than that of inflammation of the lungs, and even occasionally bordering on a livid hue. From the very commencement of the disease there is some discharge from the nose; at first of a mere watery nature, but soon thickening, and containing flakes, some of which stick to the membrane of the nose, and have been mistaken for ulcers. This discharge, at no great distance of time, becomes mattery and offensive. The glands likewise of the throat and under-jaw become enlarged, and the membranes of the nostril and the throat are inflamed and tender, and therefore the food is "quidde," and there is difficulty even in swallowing water, particularly if it be cold. The horse sips and slavers in the pail, and repeatedly coughs as he drinks. The cough is sometimes frequent and painful; so much so, that the horse repeatedly stamps with his feet, and shows signs of impatience and suffering in the act of coughing. To these symptoms rapidly succeeds very great weakness. The horse staggers, and sometimes almost falls as he moves about his box; or he supports himself by leaning his sides or his quarters against the stall. To the inexperienced observer this early and excessive weakness will be very alarming, and he will give up the horse as lost. The legs generally swell, and enlargements appear on

the chest and belly. These, however, are generally favourable. The pulse is quickened. It rises to sixty or seventy, but the number of its beatings, and the character of the pulse, which is seldom very hard, depend much on the degree of fever which accompanies the disease.

After a few days the cough becomes less frequent and painful; the glands of the throat diminished; the horse begins to eat a little green meat, and is more cheerful. In some cases, however, the membrane of the nose reddens, or streaks of red run through the lividness; and the legs become cold, and the countenance haggard, and inflammation of the lungs is at hand. At other times the breath is offensive; the discharge from the nose bloody; the evacuations loose, and slimy, and bloody; and the animal is speedily destroyed. The cause of this disease is obscure. It may be the consequence of common cold; or it will more frequently depend on some unexplained influence of the atmosphere. About the middle of spring and the commencement of autumn it is most frequent. Many horses in the same district, or in almost every part of the country, will be attacked by it. If the spring or autumn be wet and variable, almost every cold will degenerate into it; and there are too many circumstances which lead us to conclude that it is infectious. A lot of horses was bought at one of the fairs. They were all but one sent immediately to the residence of the purchaser at a considerable distance. The remaining one was employed for some purpose, and afterwards sent on a journey. He was seized with distemper, and on recovering sufficiently to travel, he was taken home. Three months had now elapsed since the purchase, and the other horses had been perfectly healthy; but in less than a fortnight after this horse arrived, they all sickened with distemper.

The treatment of catarrhal fever requires much judgment. It is clearly febrile in its commencement; but it speedily assumes the character of weakness. We will suppose that the disease is discovered at its very commencement. Bleeding will then be indispensable, regulated in quantity by the degree of fever; rarely exceeding four quarts, never intentionally pursued until the animal is faint, and immediately stopped when there is the slightest appearance of faintness. The bleeding should be repeated if the pulse is frequent and strong; or if the membrane of the nose is getting red, and the legs cold, and even although weakness should be rapidly coming on; but it should be in small quantity, and the effect of it carefully watched.

If the disease has been suffered to run on for two or three days, and the horse begins to stagger, the practitioner or the owner will consider all the symptoms well before he ventures to bleed. Redness of the nostril, heat of the mouth, quickness and force of pulse, heaving of the flanks, or coldness of the legs, will require the loss of blood, notwithstanding considerable weakness; but if the animal is quite off his feed, and the inside of the nose is livid, and he is fast losing condition as well as strength, bleeding will be better avoided.

It is of importance that the bowels should be evacuated; and there is not so much danger in the use of a little purgative medicine as in

inflammation of the lungs. Two drachms of Barbadoes aloes may be given in the form of a ball, or in solution; and in twelve hours another drachm may be given, and even a third dose twelve hours after that, if the faeces have not been loosened; taking care to back-rake the animal, and to administer injections of thin gruel.

The sedative medicines at first exhibited should be the same as in inflammation of the lungs, and in the same quantity; but as soon as the fever begins to remit, two drachms of the spirit of nitrous ether should be added to each dose; and, the weakness increasing, and the fever still more subsiding, the chamomile may be ventured on, but with caution. Warm clothing is necessary, and particularly about the head; and although the box should still be airy, it should not be so cool as in inflammation of the lungs. If the throat be so sore that the animal will not eat, either the parotid or the submaxillary glands, or both, should be blistered. It will be far better to blister them at once, than to lose time by the use of weaker and ineffective applications. The discharge from the nose should be promoted, and the natural progress of the inflammation of the membrane of the nose and throat hastened by hot mashes being frequently put in the manger, or, if the horse is not too much distressed by it, hung under his nostril in a common nose-bag. When this is resorted to, a hood about the head will be particularly necessary.

A great deal of weakness soon follows an attack of catarrhal fever, and it will then be necessary, even while we are subduing the fever, to support the strength of the animal. He should be offered bran-mashes, malt-mashes, damped hay, green meat, or carrots. If he refuses to take them, they should be insinuated between his grinders, when, being compelled to bruise them a little in endeavouring to get rid of them, and thus experiencing their taste, he will often be induced to eat several little portions. If he obstinately refuses to feed, he must be drenched with thick gruel; but this will seldom be necessary if all water be refused him from the earliest period of the disease, and a pail with thinner gruel be suspended in some part of his box. When he finds that he can get nothing else, he will drink sufficient of this to afford him all the nutriment we require. The preservation of due warmth in the extremities is as necessary here as in inflammation of the lungs, and should be attempted by warm bandages, and frequent hand-rubbing.

The terminations of this disease most to be dreaded are inflammation of the lungs, and putrid fever. We know how to guard against the former, and we shall presently speak of the latter. When, however, the disease hangs long upon the horse, there is usually much mischief done in the chest, although the animal may recover. Thick wind, broken wind, and chronic cough are its occasional consequences; and likewise, as the disease has affected so great a portion of the air-passages, a peculiar liability to cold and cough, and, not unfrequently, an unpleasant and troublesome discharge from the nose will remain. Of the latter we have spoken under the

title of *nasal gleet*; the others will presently come under consideration. The farmer will not forget the infectious nature of this disease, and will immediately separate the sick animal from his companions.

The disease with which catarrhal fever is most likely to be confounded is inflammation of the lungs; and as the treatment of the two is in some particulars so different, the farmer should be enabled readily to distinguish between them. If a little care be used this will not be difficult. The febrile character of the pulse; the early discharge from the nose; the want of intense redness in the lining of the nose; the frequent and painful cough; the enlargement of the glands, and soreness of the throat; the rapid loss of strength, the sometimes constant, and at other times variable warmth of the legs; the fidgettiness and pawing, will sufficiently distinguish catarrhal fever from the oppressed pulse, red nostril, heaving flank, little cough, fixedness of limbs, and coldness of the extremities which accompany and characterise inflammation of the lungs.

THE MALIGNANT EPIDEMIC.

This commences with nearly the same symptoms as catarrhal fever—it probably at the beginning is catarrhal fever, but more than usually violent, and sooner exhausting the powers of the frame.

Its symptoms are rapid loss of strength, stinking breath, foetid discharge from the nostrils, all the evacuations becoming highly offensive, the pulse rapid, small and weak, and the animal obstinately refusing to eat. It soon runs its course. Gangrene soon succeeds to inflammation, and rapidly spreads from the part first inflamed through the whole of the cellular substance, and over every portion of the frame. When veterinary science was in its infancy, this pest used periodically to appear, and carry off hundreds of horses; and that breeder is fortunate, who does not now sometimes suffer from its ravages. The treatment of it is very unsatisfactory. The prevention may be a little more in our power, by endeavouring to get rid of the previous disease by one bleeding, when, in some seasons, catarrhal fever appears under a form more than usually violent; and by bleeding with extreme caution, or not bleeding at all, when debility begins to appear. A mild purgative may be first administered to carry off a portion of the offensive matter contained in the bowels; after which, chalk, and ginger, and opium, and gentian, and columbo, with port-wine, may be plentifully given, with green meat, or thick gruel; but except the horse be valuable, the chance of saving him is so slight, and probably the danger of spreading the pest so great, that prudence will prompt his destruction.

Most frequent in occurrence among the consequences of catarrhal fever, and inflammation of the lungs, is

CHRONIC COUGH.

It would occupy more space than we can devote to this part of our subject, to speak of all the causes of obstinate cough. The irritability

of so great a portion of the air-passages, occasioned by previous and violent inflammation of them, is the most frequent. It is sometimes connected with worms. There is much sympathy between the lungs and the intestines, and the one very readily participates in the irritation produced in the other. That it is caused by glanders, can be easily imagined, because that disease is, in its early stage, seated in or near the principal air-passages, and little time passes before the lungs become affected. It is the necessary attendant of thick wind and broken wind, for these proceed from alterations of the structure of the lungs.

Notwithstanding the clearness of the cause, the cure is not so evident. If a harsh hollow cough be accompanied by a staring coat, and the appearance of worms,—a few worm-balls may expel these parasites, and remove the irritation of the intestinal canal. If it proceed from irritability of the air-passages, which will be discovered by the horse coughing after drinking, or when he first goes out of the stable in the morning, or by his occasional throwing out thick mucous from the nose, medicines may be given, and sometimes with advantage, to diminish irritation generally. Half-doses of the digitalis, emetic tartar, and nitre, given every night, have had a very beneficial effect, especially when made up with tar, which seems to have a powerful influence in allaying these irritations. These balls should be regularly given for a considerable time. They are sufficiently powerful to quiet slight excitement of this kind, but not to nauseate the horse, or interfere in the slightest degree with his food or his work. A blister, extending from the root of one ear to that of the other, taking in the whole of the channel, and reaching six or eight inches down the windpipe, has been tried, and not without good effect, on the supposition that the irritation may exist in the fauces or the larynx; and the blister has sometimes been extended through the whole course of the windpipe, until it enters the chest.

Feeding has much influence on this complaint. Too much dry meat, and especially chaff, increases it. It is aggravated when the horse is suffered to eat his litter. Carrots afford decided relief.

The seat of the disease, however, is so uncertain, and all our means and applications so inefficacious, and the cough itself so little interfering, and sometimes interfering not at all with the health of the animal, that it is scarcely worth while to persevere in any mode of treatment that is not evidently attended with speedy benefit. The principal consideration to induce us to meddle at all with chronic cough is the knowledge that horses afflicted with it are more liable than others to be affected by changes of temperature, and that inflammation of the lungs, or of the respiratory passages, often assumes in them a very alarming character; to which, perhaps, we may add, that a horse with chronic cough cannot legally or properly be warranted sound.

When chronic cough chiefly occurs after eating, the seat of the disease is evidently in the substance of the lungs. The stomach distended with food presses upon the diaphragm, the diaphragm upon the lungs.

Connexion
with other
diseases.

Remedy.

and the lungs, already labouring under some congestion, are less capable of transmitting the air. In the violent effort to discharge their function, irritation is produced; and the act of coughing is the consequence of that irritation. This is allied with, or soon runs into

THICK-WIND.

Thick-wind consists in short, frequent, and laborious breathings, and especially when the animal is in exercise; the inspirations and expirations often succeeding each other so rapidly as evidently to express distress, and occasionally almost to threaten suffocation. Some degree of it frequently exists in round-chested and fat horses, that have little or no breeding. The reason of this is sufficiently plain. The circular chest affords sufficient room for the expansion of the lungs when the animal is at rest, and sufficient room for the accumulation of a great deal of fat and flesh; but when the horse is strongly exercised, the circulation of the blood is hurried, and its change from arterial to venous, or from vital to empoisoned blood, is more rapid. The circular chest cannot then enlarge to any great degree: yet the blood must be purified in greater quantity, and therefore what cannot be done by increase of surface, must be accomplished by frequency of action. Heavy draught horses are invariably thick winded, and so are almost all horses violently exercised on a full stomach.

A horse labouring under any inflammatory affection of the lungs is thick-winded, because the pain which he feels in the act of breathing will not permit him to respire deeply, and therefore, he must breathe quickly. A horse unused to exercise is thick-winded, because the lungs will not soon accommodate themselves to a new and laborious action.

The principal cause, however, of thick-wind is previous inflammation, and particularly inflammation of the bronchial passages. The throwing out of some fluid, which is capable of coagulation, is the result, or the natural termination of inflammation. This deposit in the substance of the lungs, or in the bronchial tubes, from inflammation of these organs, must close many of the air-cells, and lessen the dimensions of others. Then if the cells, fewer in number and contracted in size, be left for the purposes of breathing, the rapid and laborious action of the lungs must supply the deficiency, and especially when the animal is put in that state in which he requires a rapid change of blood.

The examination of thick-winded horses has thrown considerable light on the nature of the disease. In the majority of instances some of the small air-cells have been found filled up with a dense substance of a blue or darker colour. In others, the minute passages leading to the cells have been diminished, and almost obliterated, the linings of these passages being unnaturally thickened, or covered with hardened mucous; and where neither of these appearances could be observed, the lining of the cells has exhibited evident marks of inflammation, so

that absolute pain prevented the full expansion or contraction of the lungs.

Thick-wind is often the forerunner of broken-wind. It is easy to understand this: for if so much labour is necessary to contract the air cells, and to force out the wind, and the lungs work so rapidly and so violently in effecting this, some of the cells, weakened by disease, will probably be ruptured.

Of the treatment of thick-wind we have little to say. Attention to diet, and the prevention of the overloading of the stomach, and the avoidance of exercise soon after a meal, may in some degree palliate the disease, and so may constant exercise, carried to the extent of the horse's power, without too much distressing him. The capability of exertion will thus daily improve, and the breathing of the horse will become freer and deeper. This is the process of training a horse for the course; and this constitutes all the difference between a horse that has been well and one that has been badly trained.

BROKEN-WIND.

This is easily distinguished from thick-wind. In thick-wind the breathing is rapid and laborious, but the inspiration and expiration are equally so, and occupy precisely the same time. In broken-wind the inspiration is performed by one effort; the expiration by two, which is plainly to be distinguished by observing the flanks, and which occupies double the time. The reason of this may easily be stated. Broken-wind is the rupture or running together of some of the air-cells. When the lungs are expanded, the air will rush in easily enough, and one effort of the muscles of respiration is sufficient for the purpose; but when these cells have run into each other, the cavity is so irregular, and contains so many corners and blind pouches that it is exceedingly difficult to force it out again, and two efforts are scarcely competent fully to effect it.

This disease is also accompanied by a dry and husky cough of a peculiar sound, which cannot easily be described, but is recognised by every one accustomed to horses. It is the consequence of thick-wind, and of those alterations of structure consequent on inflammation. If a portion of the lung be lost to the animal, and the same quantity of pure blood must be supplied, while there is not the same surface to supply it, it is easy to suppose that, in the violent efforts which such a horse is compelled to make, some of the cells may be broken.

Broken wind may, however, occur without much previous disease. Suppose a horse to be a gross feeder, and to have filled his stomach with straw and hay, and provender that occupies a great bulk, and contains little nourishment, the lungs are squeezed into a less than the natural compass. Let the horse be now suddenly and smartly exercised; more blood must be purified, and in the violent effort to accomplish this, some of the cells give way. Therefore we do not find broken-winded horses on the race-course, for although every exertion of speed is required from them, their food lies in small compass, and

the stomach is not distended, and the lungs have room to play; and care is taken that their exertion shall be required when the stomach is nearly empty. Carriage and coach horses are seldom broken-winded, unless they bring the disease to their work, for they too live principally on corn, and their work is regular; and care is taken that they shall not be fed immediately before their work. The majority of horses thus affected come from the stables of those for whose use these pages are principally designed. The farmer's horse is the broken-winded horse; because that on which he is fed is bulky, and too often selected on account of its cheapness; because there is little regularity in the management of most of the farmer's stables, or the work of his teams; and because after many an hour's fasting the horses are often suffered to gorge themselves with this bulky food; and then, with the stomach pressing upon the lungs, and almost impeding ordinary respiration, they are put again to work, and sometimes to that which requires considerable exertion.

A profitable lesson may be learnt from this statement. The farmer perhaps may contrive to give his horses a little more corn; and a little less hay, and straw, and chaff, without much additional expense; he may contrive, too, to shorten the period of fasting, and therefore prevent the ravenous manner in which agricultural horses often feed; and more regularity may take place between the periods of feeding and of work. We have recommended the nose-bag, as a preventive of stomach-staggers; we can as earnestly recommend it as a preventive of broken-wind.

This disease depends as much upon the cramped state of the lungs, from the pressure of an overgorged stomach in the ordinary state of the animal, as on the effects of over-exertion. The agriculturist knows that many a horse becomes broken-winded in the straw-yard. There is little nutriment in the provender which he there finds, and to obtain enough for the support of life, he is compelled to keep the stomach constantly full, and pressing upon the lungs. Some have come up from grass broken-winded that went out perfectly sound. The explanation of this case is the same. The stomach was habitually gorged with coarse and innutritive herbage, and its pressure on the lungs cramped and confined their action, and produced those violent efforts which burst some of the air-cells; and especially when in their gambols in the straw-yard or in the field, or sometimes being wantonly driven about, the lungs were suddenly called upon to perform extraordinary work. There are difficulties attending this explanation of the disease; but it cannot be denied that the dissection of horses which had broken-wind has almost invariably presented these enlarged air-cells, one of which occupy the space of a great many of their natural dimensions.

The cure of a broken-winded horse no one ever witnessed; yet much may be done in the way of palliation. The food of the animal should consist of much nutriment condensed into a small compass; the quantity of oats should be increased, and that of hay

proportionably diminished; the bowels should be gently relaxed by the frequent use of mashes; the water should be given sparingly through the day, although at night the thirst of the animal should be fully satisfied; and exercise should never be taken when the stomach is full. It will scarcely be believed how much relief these simple measures will afford to the broken-winded horse, and of how much exertion he may be gradually rendered capable. Some treated on this plan have even been hunted, and have acquitted themselves well in the field. Carrots are very useful to the broken-winded horse, not only as containing much nutriment and considerable moisture, so that less water may be required, but from some property which they possess rendering them beneficial in every chest affection. A broken-winded horse turned out to grass will never improve, on account of the almost constant distension of the stomach; but he may be fed on more succulent substances, as turnips and mangel-wurzel, with evident advantage. They are easy of digestion, and soon pass out of the stomach.

Medical treatment is of little avail, except that organs so violently excited as the lungs of broken-winded horses frequently are, must be subject to inflammation, and the difficulty of breathing in these horses is sometimes sadly increased. A little blood may then be subtracted, and other means taken which have been recommended for inflammatory affections of the chest. In case of frequent or periodical returns of difficulty of breathing, to which these horses are very subject, a course of mild aperients, united with mercury, have been given with decided advantage. Two drachms of aloes, and one of calomel, may be given twice in the week. The barbarous practice of some farriers of making holes near the anus, and sometimes in other parts, to let out the broken-wind, cannot be too strongly reprobated.

Thick-wind and broken-wind exist in various degrees, and many shades of difference. Dealers and horsemen generally have characterized them by names that can boast no elegance, but are considerably expressive of the state of the animal. Our readers should not be ignorant of them. Some horses make a shrill noise when in quick action—they are said to be *PIPERS*. This is a species of *Roaring*. There is usually a ring of coagulated matter round the inside of the windpipe, by which the cavity is materially diminished, and the sound produced in quick breathing must evidently be shriller. Sometimes the piping is produced by a contraction of the small passages of the lungs.

The *WHEEZER* utters a sound not unlike that of an asthmatic person when a little hurried. This is a kind of thick-wind, and is caused by the lodgment of some mucous fluid in the small passages of the lungs. It frequently accompanies *bronchitis*. Wheezing can be heard at all times, even when the horse is at rest in the stable; roaring is confined to the increased breathing of considerable exertion.

The *WHISTLER* utters a shriller sound than the wheezer, but only when in exercise, and that of some continuance. A sudden motion will not always produce it. It seems to be referable to some contraction

in the windpipe or the larynx. The sound is a great nuisance to the rider, and the whistler very speedily becomes distressed. A sharp gallop up hill will speedily detect the whistler.

When the obstruction seems to be principally in the nose, the horse loudly puffs and blows, and the nostrils are dilated to the utmost, while the flanks are comparatively quiet. This animal is said to be a *HIGH-BLOWER*. With all his apparent distress, he often possesses great speed and endurance. The sound is unpleasant, but the lungs may be perfectly sound.

Every horse violently exercised on a full stomach, or when overloaded with fat, will grunt very much like a hog. The pressure of the stomach on the lungs, or that of the fat accumulated about the heart, will so much impede the breathing, that the act of forcible expiration will be accompanied by this kind of sound; but there are some horses who will at all times utter this sound, if suddenly touched with the whip or spur. They are called *GRUNTERS*, and should be avoided. There is some altered structure of the lungs, which prevents them from suddenly accommodating themselves to an unexpected demand for exertion. It is the consequence of previous disease, and is frequently followed by thick, or broken-wind, or roaring.

CHAPTER V.

THE STOMACH AND INTESTINES—THEIR DISEASES.

THE DIAPHRAGM.

THE chest is separated from the abdomen or belly, by the diaphragm or midriff, which extends obliquely from the loins to the breast-bone. In its natural state it is convex, or projecting forward towards the lungs, and concave or hollow backward towards the stomach and intestines. On the side towards the chest it is covered by the membrane which invests the lungs, and towards the belly by that which covers the intestines. It is attached to the spine, the ribs, and the breast-bone by tendinous or fleshy expansions, and in the centre it is composed of strong muscular fibres. It is one of the most important muscles of the frame. It is, as we have described it, the principal agent in breathing. When it acts, its fibres are shortened; it loses its convexity and becomes plane; the chest is thereby enlarged, and the lungs enlarge with the expansion of the cavity in which they are placed; and air rushes in, and inspiration is performed. When the fibres of the diaphragm cease to act, that muscle returns to its natural form; it becomes again convex; it presses upon the lungs, and helps to force out the air, and expiration is accomplished. It assists likewise in the natural constant motion of the bowels, and lends its powerful aid in the expulsion of the dung and urine, and in the birth of the young animal. It is most concerned in coughing, yawning, sighing, &c. The membrane

which covers the diaphragm is very subject to inflammation. Whether the original seat of disease be in the lungs or the bowels, the diaphragm soon becomes inflamed and irritable, which accounts for the breathing of the horse being so much affected under every inflammation of the chest or belly. The diaphragm is likewise occasionally ruptured, principally from violent exertion. It has so much to do in the act of breathing, that it is not to be wondered if, when the respiration is exceedingly hurried, this muscle should give way. The symptoms of ruptured diaphragm are very obscure. There are none on which we can perfectly depend. This, however, is a matter of little consequence, for it is uniformly fatal. If the rupture be small, some portion of the intestines insinuates itself, and becomes entangled, and the passage is incurably obstructed; and if the aperture be large, so much of the intestine passes through as to press upon the lungs, and render breathing impossible.

Three large vessels pass through the diaphragm; the great artery which conveys the blood from the heart to the hinder part of the frame, and which goes through a kind of division of the diaphragm, so that it cannot be pressed upon; the great vein carrying the blood from the hinder parts and the liver to the heart, and which penetrates the firm tendinous part of the diaphragm so as likewise to be preserved from pressure; and the gullet, which passes through the most fleshy portion of the diaphragm, and is liable to be compressed by the constant action of this muscle, which, however, is a matter of little consequence, for there is sufficient power in the muscles of the gullet to propel the food through the diaphragm into

THE STOMACH,

Which is found on the left side of the belly, lying upon the large intestines; its fore part close to the liver; and its left side in contact with the diaphragm. This situation of the stomach will at once explain the reason why a horse is so much distressed, and sometimes irreparably injured if worked hard immediately after a full meal. The stomach must be displaced and driven back in the belly by every contraction of the diaphragm or act of inspiration; then in proportion to the fulness of the stomach will be the weight to be overcome, and the labour of the diaphragm, and the exhaustion of the animal. If the stomach be much distended, it may be too weighty to be forced sufficiently far back to make room for the quantity of air which the animal in a state of exertion requires. Hence the frequency and labour of the breath, and the quickness with which such a horse is blown, or, possibly, destroyed. Hence the folly of giving too full a meal, or too much water before the horse starts on a journey; and hence, likewise, the absurdity and danger of that unpardonable custom of some grooms to gallop the horse after his drink, in order to warm it in his belly, and prevent gripes.

The horse was destined to be the servant of man, and to serve him at all hours, and whether fasting or full; it would seem, therefore, that

to lessen the inconvenience or danger of the pressure of the stomach on the diaphragm, a smaller stomach, in proportion to his size, is given to the horse than to almost any other animal. The bulk of the horse, and the services required of him, demand much nutriment; and his nutriment is of such a nature that it must occupy a very considerable space, yet his stomach, compared with his bulk, is not half so large as that of the human being; and therefore, although he, like every other animal, feels inconvenience from great exertion immediately after a full meal, he feels not so much as other animals, for his stomach is small, and a great proportion of what he eats rapidly passes through it, and descends to a part of the intestines distant from the diaphragm, and where the existence and pressure of the food cannot cause him any annoyance.

The stomach of the horse being small, the wonderful change which is effected in the food, and the nature of which has never been thoroughly understood, proceeds very rapidly. The horse, in some instances, will eat a great deal more than the stomach will hold, and room can only be made for the reception of the fresh food by that which had been previously received being discharged through the pyloric orifice.

Of one disease of the stomach, arising from over distension, *stomach-staggers*, we have already spoken, in the second chapter, page 18. In a few instances the stomach has been known to be distended with air, but there are no characteristic symptoms by which this may be distinguished from distension by food, and the treatment would be the same.

Of inflammation of the stomach in the horse, except from poisonous herbs or drugs, we know little. It very rarely occurs, and then can with difficulty be distinguished from inflammation of the bowels.

Few horses are destroyed by poisonous plants. Natural instinct teaches them to avoid those which would be injurious.

Of the mineral poisons we will mention only two. *Arsenic* was formerly celebrated as a tonic and a destroyer of worms in the horse; and doses sufficient to kill three or four men used to be daily administered, and generally with impunity; the dose has, however, in some cases been too strong, and the animal has died. There are better tonics and vermifuges, and the drug will probably soon be discarded from veterinary practice. *Corrosive sublimate* is given internally, and often with advantage in farcy. It is used externally to destroy vermin, to cure mange, and to dispose deep and fistulous ulcers to heal. The symptoms of an over-dose of either are loss of appetite, discharge of saliva from the mouth, pawing, looking eagerly at the flanks, rolling, profuse perspiration, thready pulse, rapid weakness, violent purging and straining, convulsions, and death.

The stomach will be found intensely inflamed, with patches of yet greater inflammation. The whole course of the intestine will be inflamed, with particular parts black and gangrenous.

The antidote, if it be not too late to administer it, would be, for

arsenic, lime water, or chalk and water, or soap and water, given in great quantities with the stomach-pump; and for corrosive sublimate, the white of eggs mixed with water, or thick starch, or arrow-root. If the poisoning be malicious, arsenic may be most readily detected by mixing a little of the fluid taken from the intestines with a weak solution of blue vitriol, to which a little hartshorn has been added—the mixture will gradually become green; or, if a little of the more solid contents of the stomach or small intestines be thrown on a red-hot iron, a smell of garlic will be perceived.

For corrosive sublimate there is a simpler test. Place a drop of the suspected fluid on a piece of gold, let the stem of a small key touch the gold while the handle is brought into contact with the drop, and the gold will immediately be stained; or mix a little of the suspected fluid with lime water, and the corrosive sublimate, if there be any, will be thrown to the bottom, of an orange colour; or if hartshorn be used, the precipitate will be white.

BOTS.

In the spring and early part of the summer, horses are much troubled by a grub or caterpillar, which crawls out of the anus, fastens itself under the tail, and seems to cause a great deal of itching or uneasiness. Grooms are sometimes alarmed at the appearance of these insects. Their history is curious, and will dispel every fear with regard to them.

A species of gad-fly, is in the latter part of the summer exceedingly busy about the horse. They are observed to be darting with great rapidity towards the knees and sides of the animal. The females are depositing their eggs on the hair, and which adhere to it by means of a glutinous fluid with which they are surrounded. In a few days the eggs are ready to be hatched, and the slightest application of warmth and moisture will liberate the little animals which they contain. The horse in licking himself touches the egg, it bursts, and a small worm escapes, which adheres to the tongue, and is conveyed with the food into the stomach; there it clings, by means of a hook on either side of its mouth, to the cuticular portion of the stomach, and its hold is so firm and so obstinate, that it will be broken before it will be detached. It remains feeding there on the mucous of the stomach during the whole of the winter, and to the end of the ensuing spring; when, having attained a considerable size, and being destined to undergo a certain transformation, it disengages itself from the cuticular coat, is carried into the villous portion of the stomach with the food, passes out of it with the chyme, and is at length evacuated with the dung.

The larva or maggot being thus thrown out seeks shelter in the ground, contracts in size, and becomes a chrysalis or grub; in which state it lies inactive for a few weeks, and then, bursting from its confinement, assumes the form of a fly. The female, becoming impregnated, quickly deposits her eggs on those parts of the horse which he is most likely to lick, and so the species is perpetuated.

There are several plain conclusions from this history. The bots cannot, while they inhabit the stomach of the horse, give the animal any pain, for they are fastened on the cuticular and insensible coat. They cannot stimulate the stomach and increase its digestive power, for they are not on the digestive portion of the stomach. They cannot, by their roughness, assist the trituration or rubbing down of the food, for no such office is performed in that part of the stomach—the food is softened, not rubbed down. They cannot be injurious to the horse, for he enjoys the most perfect health when the cuticular part of his stomach is filled with them, and their presence is not even suspected until they appear at the anus. They cannot be removed by medicine, because they are not in that part of the stomach to which medicine is usually conveyed; and if they were, their mouths are too deeply buried in the mucous for any medicine, that can safely be administered, to affect them; and, last of all, in due course of time they detach themselves, and come away. Therefore, the wise man will leave them to themselves, or content himself with picking them off when they collect under the tail and annoy the animal.

INTESTINES.

The food having been partially digested in the stomach, and converted into chyme, passes through the pyloric orifice into the intestines.

The intestines of a full grown horse are not less than ninety feet in length. The length of the intestines in different animals depends on the nature of the food. The nutritive matter is with much more difficulty extracted from vegetable than animal substances, therefore the alimentary canal is large, long, and complicated, in those which, like the horse, are fed on herbs alone. They are divided into the small and large intestines; the former of which occupy about sixty-six feet, and the latter twenty-four. The intestines, like the stomach, are composed of three coats. The outer one consists of the peritoneum, covering the contents of the belly. By means of this coat the bowels are confined in their proper situations; and, this membrane being smooth and moist, all friction and concussion are avoided. Did the bowels float loosely in the belly they would be subject to constant entanglement and injury amid the rapid and violent motions of the horse.

The middle coat, like that of the stomach, is muscular, and composed of two layers of fibres, one running longitudinally, and the other circularly; and by means of these muscles, which are continually contracting and relaxing from the upper part downward, the food is forced along the bowels. The inner coat is the mucous or villous;—mucous, because it abounds with small glands which pour out a mucous fluid to lubricate the passage and defend it from irritating or acrimonious substances; and villous from its soft velvet feel. This coat is crowded with innumerable little mouths, which are the commencement of minute vessels, by which the nutritive part of the food is taken up; and these vessels, uniting and passing over the mesentery, carry this nutritive matter to a receptacle for it,

whence it is conveyed into the circulation and distributed to every part.

The intestines are more particularly retained in their places by the *mesentery*, (middle of the intestines,) which is a doubling of the peritoneum, including the intestine in its bottom, and likewise inclosing between its folds the arteries and veins, and nerves, and the vessels which convey the nutriment from the intestines to the circulation.

DISEASES OF THE INTESTINES.

These form a very important part of horse surgery, and many erroneous notions are prevalent respecting them. The first disease we will consider is

SPASMODIC COLIC.

We have said, that the passage of the food through the intestinal canal is effected by the alternate contraction and relaxation of the muscular coat of the intestines. When that action is simply increased through the whole of the canal, the food passes more rapidly, and purging is produced; but the muscles of every part of the frame are liable to irregular and spasmodic action, and the muscular coat of some portion of the intestines may be thus affected. A species of cramp may attack a portion of the intestines. The spasm may be confined to a very small part of the canal. The gut has been found, after death, strangely contracted in various places, contraction not extending above five or six inches in any of them. In the horse, the ileum is the usual seat of this disease. It is of much importance to distinguish between spasmodic colic and inflammation of the bowels, for the symptoms have considerable resemblance, although the mode of treatment should be very different.

The attack of colic is usually very sudden. There is often not the slightest warning. The horse begins to shift his posture, look round at his flanks, paw violently, strike his belly with his feet, lie down, roll, and that frequently on his back. In a few minutes the pain seems to cease, the horse shakes himself, and begins to feed; but, on a sudden, the spasm returns more violently, every indication of pain is increased, he heaves at the flanks, breaks out into a profuse perspiration, and throws himself more violently about. In the space of an hour or two, either the spasms begin to relax, and the remissions are of longer duration, or the torture is augmented at every paroxysm, the intervals of ease are fewer and less marked, and inflammation and death supervene.

Of the symptoms by which it may best be distinguished from inflammation of the bowels, we shall speak when we treat of that disease.

Among the causes of colic are, the drinking of cold water when the horse is heated. There is not a surer cause of violent spasm than this. Colic will sometimes follow the exposure of a horse to the cold air, or a cold wind after violent exercise. Green food, although, generally speaking, most beneficial to the horse, yet

given in too large a quantity, or when the horse is hot, will frequently produce gripes. In some horses there seems to be a constitutional predisposition to colic. They cannot be hardly worked, or exposed to unusual cold, without a fit of it. In many cases, when these horses have died, stones have been found in some part of the alimentary canal.

Fortunately, we are acquainted with several medicines that allay these spasms; and the disease often ceases almost as suddenly as it appeared. Turpentine is one of the most powerful remedies, especially if given in union with opium. Three ounces of spirit or oil of turpentine, with an ounce of laudanum, given in a pint of warm ale, will frequently have an almost instantaneous effect. If relief be not obtained in half an hour it will be prudent to bleed, because the continuance of violent spasm will produce inflammation. Some practitioners bleed at first, and it is far from bad practice; for although the majority of cases will yield to turpentine, opium, and aloes, an early bleeding may occasionally prevent the recurrence of inflammation, or at least mitigate it. If it be clearly a case of colic, half of the first dose may be repeated, with a full ounce of Barbadoes aloes dissolved in warm water. The stimulus produced on the inner surface of the bowels by the purgative may counteract the irritation which caused the spasm. The belly should be well rubbed with a brush or warmed cloth. The horse should be walked about, or trotted moderately. The motion thus produced in the bowels, and the friction of one intestine over the other, may relax the spasm, but the hasty gallop may speedily cause inflammation to succeed to colic. Clysters of warm water, or containing a solution of aloes, will be injected.

When relief has been obtained, the clothing of the horse, saturated with perspiration, should be removed, and fresh, dry clothing substituted. He should be well littered down in a warm stable or box, and have bran mash for the next two or three days, and drink only luke warm water.

Some persons give gin, and even gin and pepper, in cases of gripes. This, however, is a practice to which we strongly object; it may be useful, or even sufficient, in ordinary cases of colic, but if there be any inflammation or tendency to inflammation, it cannot fail to be highly injurious.

CALCULI, OR STONES IN THE INTESTINES.

We have mentioned these as a cause of colic in horses that are subject to frequent attacks of it. Some indigestible substance lodges in the cæcum or colon: earthy, or half-digested vegetable matter gradually accumulates around this, and a ball, weighing many pounds, is sometimes formed. This will produce colic, or obstruct the passage of the gut, or, by its pressure, produce inflammation; but as there are few or no symptoms by which the presence of these stones is clearly indicated, and few, or rather, no certain means, by which they may be removed, we will pass on to an occasional consequence of colic.

INTUSUSCEPTION OF THE INTESTINES.

The spasmodic action of the ileum long continued, may be succeeded by an inverted action from the cæcum towards the stomach, more powerful than the natural action; and the contracted portion of the intestine is thus forced into a portion above it that retains its natural calibre; and the irritation caused by this increases the action, until more is forced in, and an obstruction is formed which no power can overcome. Even the natural motion of the bowels will be sufficient to produce intususception, when the contraction of a portion of the ileum is very great. There are no symptoms to indicate the presence of this, except continued and increasing pain; or if there were, all our means of relief would here fail.

ENTANGLEMENT OF THE BOWELS.

This is another and more singular consequence of colic. Although the ileum is enveloped in the mesentery, and its motion to a considerable degree confined, yet under the spasm of colic, and during the violence with which the animal rolls and throws himself about, portions of the ileum become so entangled as to be twisted into nooses and knots, drawn together with a degree of tightness scarcely credible. Nothing but the extreme and lengthened torture of the animal can lead us to suspect that this has taken place, and, could we ascertain its existence, there would be no cure.

INFLAMMATION OF THE BOWELS.

There are two varieties of this malady. The first is inflammation of the external coats of the intestines, accompanied by considerable fever and costiveness. The second is that of the internal or mucous coat, usually the consequence of an over-dose of physic, and accompanied by violent purging. We will here speak of the first of these affections. It has been divided into inflammation of the peritoneal coat, and that of the muscular: but the causes, symptoms, and treatment of both are so much alike, that it would be raising unnecessary difficulties to endeavour to distinguish between them. Inflammation of the external coats of the stomach, whether the peritoneal or muscular, or both, is a very frequent and fatal disease. It speedily runs its course, and it is of great consequence that its early symptoms should be known. If the horse has been carefully observed, restlessness and fever will have been seen to precede the attack; in many cases a direct shivering fit will be observed; the mouth will be hot, and the nose red. The horse will soon express the most dreadful pain by pawing, striking at his belly, looking wildly at his flanks, groaning and rolling. The pulse will be quickened and small; the ears and legs cold; the belly tender and sometimes hot; the breathing quickened; the bowels costive; and the horse becoming rapidly and fearfully weak.

It may be useful to give a short table of the distinguishing symptoms of colic and inflammation of the bowels, because the treatment recommended for the former would often be fatal to the latter.

INFLAMMATION OF THE BOWELS.

COLIC.

Sudden in its attack.

Pulse rarely much quickened in the early period of the disease, and during the intervals of ease: but evidently fuller.

Legs and ears of the natural temperature. Relief obtained from rubbing the belly.

Relief obtained from motion.

Intervals of rest.

Strength scarcely affected.

INFLAMMATION OF THE BOWELS.

Gradual in its approach, with previous indications of fever.

Pulse very much quickened, but small, and often scarcely to be felt.

Legs and ears cold. Belly exceedingly tender and painful to the touch.

Motion evidently increasing the pain.

Constant pain.

Rapid and great weakness.

The causes of this disease are, first of all, and most frequently, sudden exposure to cold. If a horse that has been highly fed, carefully groomed, and kept in a warm stable, be heated with exercise, and have been for some hours without food; and in this state of exhaustion be suffered to drink freely of cold water, or be drenched with rain, or have his legs and belly washed with cold water, an attack of inflammation of the bowels will often follow. An overfed horse subjected to severe and long-continued exertion, if his lungs were previously weak, will probably be attacked by inflammation of them; but if the lungs were sound, the bowels will on the following day be the seat of disease. Stones in the intestines are an occasional cause of inflammation, and colic neglected, or wrongly treated, will terminate in it.

The treatment of inflammation of the bowels, like that of the lungs, should be prompt and energetic. The first and most powerful means of cure will be bleeding. From six to eight or ten quarts of blood should be taken as soon as possible, and the bleeding repeated to the extent of four or five quarts more if the pain be not relieved, and the pulse have not become rounder and fuller. The speedy weakness that accompanies this disease should not deter from bleeding largely. It is the weakness that is the consequence of violent inflammation of these parts, and if that inflammation be subdued by the loss of blood, the weakness will disappear. The bleeding should be effected on the first appearance of the disease, for there is no malady that so quickly runs its course.

Next to bleeding will follow clysters. Although the bowels are usually confined, we cannot administer a strong purgative; the intestines are already in far too irritable a state. The clyster may consist of warm water, or very thin gruel, in which half a pound of Epsom salts, or half an ounce of aloes has been dissolved, and too much fluid can scarcely be thrown up. If the common ox-bladder and pipe be used, it should be frequently replenished. The horse may likewise be encouraged to drink plentifully of warm water or thin gruel; and draughts, each containing a couple of drachms of dissolved aloes, may be given every six hours, until the bowels are freely opened.

Next, it will be prudent to endeavour to excite considerable external inflammation, as near as possible to the seat of internal disease, and therefore the whole of the belly should be blistered. In a well-marked

case of this inflammation, no time should be lost in applying fomentations, but the blister should be at once resorted to. The tincture of Spanish flies, whether made with spirit of wine or turpentine, should be well rubbed in. The legs should be well bandaged, to restore the circulation to them, and thus lessen the flow of blood to the inflamed part, and for the same reason the horse should be warmly clothed, but the air of the stable should be cool.

No corn or hay should be given during the disease, but bran-mashes, and green food if it can be procured. The latter will be the best of all food, and may be given without the slightest apprehension of danger. When the horse begins to recover, he may get a handful of corn two or three times in the day, and, if the weather be warm, may be turned into a small enclosure for a few hours in the middle of the day. Clysters of gruel should be continued for three or four days after the inflammation is beginning to subside, and good hand-rubbing applied to the legs.

The second variety of inflammation of the bowels affects the internal or mucous coat, and is generally the consequence of physic given in too great quantity, or of an improper kind. The purging is more violent, and continues longer than was intended; the animal shows that he is suffering great pain; he frequently looks round at his flanks; his breathing is laborious, and the pulse is quick and small; not so small, however, as in inflammation of the peritoneal coat, and, contrary to some of the most frequent and characteristic symptoms of that disease, the mouth is hot, and the legs and ears are warm. Unless the purging is excessive, and the pain and distress great, we should hesitate at administering any astringent medicine at first. We should plentifully administer gruel, or thin starch, or arrow-root, by the mouth and by clyster, removing all hay and corn, and particularly green food. We should endeavour thus to sheath the irritated surface of the bowels, while we permit any remains of the medicine to be carried off. If, however, twelve hours should pass, and the purging and the pain remain undiminished, we should continue the gruel, but add to it chalk, catechu, and opium, in doses of an ounce of the first, a quarter of an ounce of the second, and two scruples of the last, repeated every six hours. As soon as the purging begins to subside, the astringent medicine should be lessened in quantity, and gradually discontinued. Bleeding will rarely be necessary unless the inflammation be very great, and attended by symptoms of general fever. The horse should be warmly clothed, and be placed in a warm stable, and his legs should be hand-rubbed and bandaged.

Violent purging, and attended with much inflammation and fever, will sometimes occur from other causes. Green food will sometimes purge. A horse worked hard upon green food will scour. The remedy is change of diet, or less labour. Young horses will scour, and sometimes without any apparent cause. Astringents should be used with much caution here. It is probably an effort of nature to get rid of something that offends. A few doses of gruel will assist in effecting

this purpose, and the purging will cease without the use of astringent medicine.

Some horses that are not *well ribbed home*, (having too great space between the last rib and the hip-bone,) are subject to purging if more than usual exertion is required from them. They are recognised by the term of *washy* horses. They are often free and fleet, but destitute of continuance. They should have more than the usual allowance of corn, with beans, when at work; and a cordial ball, with one drachm of catechu, and ten grains of opium will often be serviceable either before or after a journey.

WORMS.

Worms of different kinds inhabit the intestines; but except when they exist in very great numbers, they are not so hurtful as is generally supposed, although the groom may trace to them hidebound, and cough, and loss of appetite, and gripes, and megrims, and a variety of other ailments. Of the origin or mode of propagation of these parasitical animals we will say nothing; neither writers on medicine, nor even on natural history, have given us any satisfactory account of the matter.

The long white worm (*lumbricus teres*) much resembling the common earth-worm, and, being from six to ten inches long, inhabits the small intestines. It is a formidable looking animal, and if there are many of them they may consume more than can be spared of the nutritive part of the food or the mucous of the bowels; and we think that we have seen a tight skin, and rough coat, and tucked up belly, connected with their presence. They have then, however, been voided in large quantities, and when they are not thus voided we should be disposed to trace these appearances to other causes. A dose of physic will sometimes bring away almost incredible quantities of them. Calomel is frequently given as a vermifuge. The less frequently this drug is administered to the horse the better. It is the principal ingredient in some quack medicines for the expulsion of worms in the human subject, and thence, perhaps, it came to be used for the horse, but in him we believe it to be inert as a vermifuge, or only useful as quickening the operation of the aloes. When the horse can be spared, a strong dose of physic is an excellent vermifuge, so far as the long round worm is concerned; but perhaps a better medicine, and not interfering with either the feeding or work of the horse, is two drachms of emetic tartar, with a scruple of ginger, made into a ball, with linseed meal and molasses, and given every morning half an hour before the horse is fed.

A smaller, darker coloured worm, called the needle worm, or *ascaris*, inhabits the large intestines. Hundreds of them sometimes descend into the rectum, and immense quantities have been found in the cæcum. These are a more serious nuisance than the former, for they cause a very troublesome irritation about the fundament, which sometimes sadly annoys the horse. Their existence can generally be discovered, by a small portion of mucous, which hardening, is converted into a

powder, and is found about the anus. Physic will sometimes bring away great numbers of these worms, but when there is much irritation about the tail, and much of this mucous indicating that they have descended into the rectum, an injection of a quart of linseed oil, or of an ounce of aloes dissolved in warm water, will be a more effectual remedy.

The tape worm is seldom found in the horse.

PHYSICKING.

This would seem to be the most convenient place to speak of physicking horses, a mode of treatment necessary under various diseases, but which has injured the constitution of more horses, and in fact absolutely destroyed more of them, than any other thing that can be mentioned. When a horse comes from grass to hay, or from the cool open air to a heated stable, a dose of physic or even two doses may be useful to prevent the tendency to inflammation which must be the necessary consequence of so sudden and great a change. To a horse that is becoming too fat, or has surfeit, or grease, or mange, or that is out of condition from inactivity of the digestive organs, a dose of physic is often most serviceable; but we do enter our protest against the periodical physicking of all horses in the spring and the autumn, and more particularly against that severe system which is thought to be necessary to train them for work, and the absurd method of treating the horse when under the operation of physic.

A horse should be carefully prepared for the action of physic. Two or three bran-mashes given on that or the preceding day are far from sufficient, when a horse is about to be physicked, whether to promote his condition or in obedience to custom. Mashes should be given until the dung becomes softened; a less quantity of physic will then suffice, and it will more quickly pass through the intestines, and be more equally diffused over them. Five drachms of aloes, given when the dung has thus been softened, will act much more effectually, and much more safely than seven drachms, when the lower intestines are obstructed by hardened faeces.

On the day on which the physic is given, the horse should have walking exercise, or may be gently trotted for a quarter of an hour twice in the day; but after the physic begins to work, he should not be moved from his stall. Exercise then would produce gripes, irritation, and possibly dangerous inflammation. The common and absurd practice is to give the horse most exercise after the physic has begun to operate.

A little hay may be put into the rack; as much mash may be given as the horse will eat, and as much water, with the coldness of it taken off, as he will drink. If, however, he obstinately refuses to drink warm water, it is better that he should have it cold, than to continue without taking any fluid; but he should not be suffered to take more than a quart at a time, with an interval of at least an hour between each portion.

When the purging has ceased, or *the physic is set*, a mash should be given once or twice every day until the next dose is taken, between which and the *setting* of the first there should be an interval of a week. The horse should recover from the languor and debility occasioned by the first dose, before he is harassed by a second.

Eight or ten tolerably copious motions will be perfectly sufficient to answer every good purpose, although the groom or the carter may not be satisfied unless double the quantity are procured. The consequence of too strong purgation will be, that a lowness and weakness will hang about the horse for many days or weeks, and inflammation will often ensue from the over-irritation of the intestinal canal.

Long continued custom has made ALOES the almost invariable purgative of the horse, and very properly so; for there is no other at once so sure and safe. The Barbadoes aloes, although sometimes very dear, should alone be used. The dose, with a horse properly prepared, will vary from five to seven drachms. The preposterous doses of nine, ten, or even twelve drachms are, happily for the horse, generally abandoned. Custom has assigned the form of a ball to physic, but good sense will in due time introduce the solution of aloes, as acting more speedily, effectually, and safely.

The only other purgative on which dependence can be placed is the CROTON. The farina or meal of the nut is used; but from its acrimony it should be given in the form of ball, with linseed meal, (flaxseed flour.) The dose varies from a scruple to half a drachm. It acts more speedily than the aloes, without the nausea which they produce; but it causes more watery stools, and consequently more debility.

LINSEED OIL is a certain and safe purgative, in doses from a pound to a pound and a half. OLIVE OIL is more uncertain but safe, and CASTOR OIL, that mild aperient in the human being, is both uncertain and unsafe.

The horse, and particularly the perfect horse, is occasionally subject to

HERNIA OR RUPTURE.

A portion of the intestines protrudes out of the cavity of the belly either through some natural or artificial opening. In some cases it may be put back, but from the impossibility of applying a truss or bandage it soon returns again. At other times the opening is so narrow, that the gut, gradually distended by faeces, or thickened by inflammation, cannot be replaced, and *strangulated* hernia is then said to exist. The seat of hernia is either in the scrotum of the perfect horse, or the groin of the gelding. The causes are violent struggling when under operations, over-exertion, kicks, or accidents. The assistance of a veterinary surgeon is here indispensable.

THE LIVER.

Between the stomach and the diaphragm, its right lobe or division in contact with the diaphragm, the duodenum and the right kidney, and

the middle and left divisions with the stomach, is the liver. It is an irregularly shaped, reddish-brown substance of considerable bulk, and performs a very singular and important office.

The blood, which has been conveyed to the different parts of the body by the arteries, is carried back to the heart by the veins; but that which is returned from the stomach and intestines, and spleen, and pancreas, and mesentery, instead of flowing directly to the heart, passes first through the liver. It enters by two large vessels which spread by means of innumerable minute branches through every part of the liver. As the blood traverses this organ, a fluid is separated from it, called the *bile*. This is probably a kind of excrement, the continuance of which in the blood would be injurious; but while this is thrown off, another important purpose is answered; the process of digestion is promoted, and particularly by the bile changing the nutritive part of the food from chyme into chyle, and separating it from that which, containing little or no nutriment, is voided as excrement.

The bile, thus formed, is in most animals received into a reservoir, the *gall-bladder*, whence it is conveyed into the duodenum at the times, and in the quantities, which the purposes of digestion require; but the horse has no gall-bladder, and, consequently, the bile flows into the intestine as fast as it is separated from the blood. The reason of this is plain; a small stomach was given to the horse, that the food might quickly pass out of it, and the diaphragm and the lungs might not be injuriously pressed upon, when we require his utmost speed; and that we might use him with little danger compared with that which would attach to other animals, even when his stomach is distended with food. Then the stomach, so small, and so speedily emptied, must be often replenished; the horse must be often eating, and food must be often passing out of his stomach; and, consequently, there is no necessity for this reservoir. The ox occupies a long time in filling his paunch, and it is only during rumination that the food passes into the true stomach to be digested. The meal of the dog is speedily swallowed. They need a gall-bladder to contain the bile which continues to be secreted when it cannot be used: but to the horse, so frequently eating, it would be useless.

INFLAMMATION OF THE LIVER

Is a disease of rare occurrence in the horse. He is not exposed to the causes which produce that complaint in other animals. Although his food is sometimes highly nutritive, the work which is exacted from him prevents it from unduly stimulating this important organ; and when inflammation of the liver does occur, it is with so much difficulty distinguished from that of the bowels, that if yellowness of the eyes and skin are not present, even the professional man is liable to be deceived.

Bleeding from, or RUPTURE OF THE LIVER, is another disease of *old horses*, and especially of those that have been highly fed. It is generally fatal, but of unfrequent occurrence; it is recognised by the

frequent and feeble pulse, the pawing and sighing of the animal, the coldness of the extremities, whiteness of the eye and mouth, fulness of the belly, and speedy debility.

JAUNDICE.

Commonly called *THE YELLOWS*, is a more tractable disease, and a little more frequent. It is the introduction of bile into the general circulation, and which is usually caused by some obstruction in the ducts or tubes which convey the bile from the liver to the intestines. The horse, however, has but one duct, through which the bile usually flows as quickly as it formed, and there is no gall-bladder in which it can become thickened, and even hardened into masses so hard as to be very appropriately called *gall-stones*. Jaundice does, however, occasionally appear either from an increased flow or altered quality of the bile, or obstruction even in this simple tube. The yellowness of the eyes and mouth, and of the skin where it is not covered with hair, mark it sufficiently plainly. The dung is small and hard; the urine high coloured; the horse languid, and the appetite impaired.

It is first necessary to inquire whether this affection of the liver be not the consequence of the sympathy of this organ with some other part; for, to a very considerable degree, it frequently accompanies inflammation of the bowels and the lungs. These diseases being subdued, jaundice will disappear. If there be no other disease to any great extent, we must endeavour to restore the natural passage of the bile by purgatives, not consisting of large doses, lest there should be some undetected inflammation of the lungs or bowels, in either of which a strong purgative would be dangerous; but given in small quantities, repeated at short intervals, and until the bowels are freely opened. Two drachms of aloes, and one of calomel, given twice every day, will be as much as can at all times be administered with safety. Bleeding should always be resorted to, regulated according to the apparent degree of inflammation, and the occasional stupor of the animal. Plenty of water slightly warmed, or thin gruel, should be given; the horse should be warmly clothed, and the stable well ventilated, but not cold. Carrots or green food will be very beneficial. Should the purging, when once excited, prove violent, we should be in no haste to stop it, unless inflammation is beginning to be connected with it, or the horse is very weak. The medicine recommended under diarrhoea may then be exhibited. A few slight tonics should be given when the horse is recovering from an attack of strangles. Two drachms each of gentian and chamomile, with one of ginger, will form a useful ball.

THE SPLEEN.

This organ, known commonly by the name of the *melt*, is a long, bluish-brown substance, broad and thick at one end and tapering at the other, lying along the left side of the stomach, and between it and the short ribs. It is of a spongy nature, divided into numerous little

cells not unlike a honey comb, and over which thousands of minute vessels are thickly spread. The particular use of this body has never been clearly ascertained; for in some cruel experiments it has been removed without apparent injury to digestion, or any other function. It is, however, useful, at least occasionally, or it would not have been given. It is perhaps a reservoir or receptacle for any fluid that may be conveyed into the stomach more than is sufficient for the purposes of digestion.

The spleen is sometimes very extraordinarily enlarged, and has been ruptured; but we are not aware of any symptoms by which this can be discovered.

THE PANCREAS.

In the domestic animals which are used for food, this organ is called the *sweetbread*. It lies between the stomach and left kidney. It much resembles in structure the salivary glands in the neighborhood of the mouth, and the fluid which it secretes is like common saliva. The pancreatic fluid is carried into the intestines by a duct which enters at the same aperture with that from the liver. Its use, whether to dilute the bile, or the chyme, or to assist in the separation of chyme from the feculent matter, has never been ascertained, but it is clearly employed in aiding the process of digestion.

We know not of any disease to which the pancreas of the horse is liable.

As soon as the belly of most of our domestic animals is opened, a membrane is perceived spreading over all the contents of this cavity; it is denominated

THE OMENTUM,

Or *cawl*. It is a doubling of the peritoneum, or rather consists of four layers of it. It has been supposed to be placed between the intestines and the walls of the belly, to prevent concussion and injury during the rapid movement of the animal. That, however, cannot be its principal use in the horse, from whom the most rapid movements are required; for in him it is unusually short, extending only to the pancreas, and a small portion of the colon. Being, however, thus short, the horse is exempt from a very troublesome and, occasionally, fatal species of rupture, when a portion of the omentum penetrates through some accidental opening in the covering of the belly.

The blood contains a great quantity of watery fluid unnecessary for the nutriment or repair of the frame. There likewise mingle with it matters which would be noxious if suffered to accumulate too much.

THE KIDNEYS

Are actively employed in separating this water, and likewise carrying off a substance which constitutes the peculiar ingredient in urine, called the *urea*, and consists principally of that which would be poisonous to the animal. The kidneys are two large glandular bodies, placed

under the loins, very much of the shape of a kidney bean. The right kidney is most forward, lying under the liver; the left is pushed more backward by the stomach and spleen. A large artery runs to each, carrying not less than a sixth part of the whole of the blood that circulates through the frame. The artery divides into innumerable little branches most curiously complicated and coiled upon each other; and the blood, traversing these convolutions, has its watery parts and others the retaining of which would be injurious, separated from it.

The fluid thus separated varies materially both in quantity and composition, even during health. There is no animal in which it varies so much as in the horse. There is no organ in that animal so much under our command as the kidney, and no medicines are so useful, or may be so injurious, as diuretics. In speaking of fever and inflammation of the lungs, and indeed inflammation generally, we have recommended the use of nitre and digitalis, not only on account of their febrifuge or sedative effects, but because they act as diuretics. They stimulate the kidneys to separate more aqueous fluid than they otherwise would do, and thus lessen the quantity of blood; the quantity which the heart is labouring to circulate through the frame, and the quantity which is determined or driven to a part already overloaded. The main objects we have to accomplish in these diseases is to reduce the force of the circulation, and to calm the violence of excitement and diuretics, by lessening the quantity of blood, are useful assistants in accomplishing these purposes. It is, however, in the varieties of dropsy that their benefit is most evident. The horse is more subject to effusions of fluid in particular parts than any other domestic animal. Swelled legs is a disease peculiar to him. The ox, the sheep, the dog, the ass, and even the mule, have it very seldom; and for the removal of this deposit of fluid in the cellular substance of the legs we have recourse to diuretics. The kidneys are stimulated to separate more than the usual quantity of water from the blood. In order to make up this deficiency in quantity, the absorbents set to work, and they take up and pour into the circulation the fluid which had been effused in the legs. The legs of many horses cannot be rendered fine, or kept so, without the use of diuretics; nor can grease, often connected with these swellings, producing them or caused by them, be otherwise subdued. We therefore rank diuretics among the most useful of the veterinary medicines.

In injudicious hands, however, these medicines are sadly abused. Among the absurdities of stable management there is nothing so injurious as the frequent use of diuretics. Not only are the kidneys, so often over-excited, weakened, disposed to disease, but the whole frame becomes debilitated, for the absorbents have carried away a great part of that which was necessary to the health and condition of the horse, in order to supply the deficiency of blood occasioned by the inordinate discharge of urine. There is likewise one important fact of which the groom or the horseman seldom thinks; that when he is removing these humours by the imprudent use of diuretics, he is only

attacking a symptom or consequence of disease, and not the disease itself. The legs will fill again, and the grease will return. While the cause remains, the effect will be produced. We shall say more of this when we treat particularly of these diseases of the extremities.

In the administration of diuretics there are two things to be chiefly attended to. The first is that which seems to be contradictory, but the good effect of which the testimony of every intelligent man will confirm—*let the horse have plenty to drink*. Not only will inflammation be prevented, but the operation of the medicine will be much promoted. If more water than usual be drunk, a great deal more will be evacuated. The next caution is, that during the administration of a diuretic neither the clothing nor the stable should be too warm, otherwise that which was intended to stimulate the kidney will pass off by perspiration; for it seems to be a law of the frame, that what increases the discharge from the skin proportionably lessens the action of the kidneys.

The best diuretic, and which given simply to promote an increased secretion from the kidneys, supersedes every other, is turpentine; either the common liquid turpentine in doses of half an ounce, and made into a ball with linseed meal, and half a drachm of ginger; or, what is better, the same quantity of powdered resin, with two drachms of linseed meal, and half a drachm of ginger, formed into a mass with palm-oil. In cases of inflammation or fever, nitre or digitalis should be used. The spirit of nitrous ether, cream of tartar, and balsam of capivi have some diuretic effect.

INFLAMMATION OF THE KIDNEY

Is no uncommon disease in the horse, and is more unskillfully and fatally treated than almost any other. The early symptoms are those of fever generally, but the seat of the disease soon becomes evident. The horse looks anxiously round at his flanks; stands with his hinder legs wide apart; straddles as he walks; expresses pain in turning; shrinks when the loins are pressed, and some degree of heat is felt there. The urine is voided in small quantities, and frequently it is high-coloured, and sometimes bloody. The attempt to urinate becomes more frequent, and the quantity voided smaller; until the animal strains painfully and violently, but the discharge is nearly or quite suppressed. The pulse is quick and hard; full in the early stage of the disease, but rapidly becoming small, yet not losing its character of hardness. These symptoms clearly indicate an affection of the urinary organs; but they do not distinguish inflammation of the kidney from that of the bladder. The hand must be introduced into the rectum. If the bladder be felt full and hard under the rectum, there is inflammation of the neck of the bladder: if the bladder be empty, yet on the portion of the intestines immediately over it there is more than natural heat and tenderness, there is inflammation of the body of the bladder; but if the bladder be empty, and there is no increased heat or tenderness, there is inflammation of the kidney.

Among the causes are improper food. There is no more frequent cause than hay that has been mow-burnt, or oats that are musty.

The farmer should look well to this. Oats that have been dried on the kiln acquire a diuretic property, and if horses are long fed on them, the continual excitement of this organ which they produce will degenerate into inflammation. Too powerful, or too often repeated diuretics produce inflammation of the kidney; or a degree of irritation and weakness of that organ, that disposes to inflammation from causes that would otherwise have no injurious effect. If a horse is sprained in the loins, by being urged on, far or fast, by a heavy rider, or by being suddenly pulled up on his haunches, the inflammation of the muscles of the loins is often speedily transferred to the kidneys, with which they lie in contact. Exposure to cold is another frequent origin of this malady, especially if the horse be drenched with rain, or the wet drips upon his loins; and more particularly, if he were previously disposed to inflammation, or these organs had been previously weakened. For this reason, hackney-coach horses and others, exposed to the vicissitudes of the weather, and often fed on unwholesome provender, have, or should have, their loins protected by a leather or a cloth.

The treatment will only vary from that of inflammation of other parts, by the consideration of the peculiarity of the organ affected. Bleeding must be promptly resorted to, and carried to its full extent. An active purge should next be administered; and a counter-inflammation excited as near as possible to the seat of disease. For this purpose, the loins should be fomented with hot water, or covered with a mustard poultice; but no cantharides or turpentine must be used, and, most of all, must no diuretic be given internally. When the groom finds this difficulty or suppression of staling, he immediately has recourse to a diuretic ball, to force on the urine; and by thus farther irritating a part already too much excited, he adds fuel to fire, and frequently destroys the horse. When the action of the purgative begins a little to cease, white hellebore may be administered, in doses of a scruple three times a day, with or without emetic tartar. The horse should be warmly clothed; his legs well bandaged, and plenty of water offered to him. The food should be carefully examined, and any thing that could have excited, or that may prolong the irritation, carefully removed.

DIABETES, OR PROFUSE STALING,

Is a comparatively rare disease. It is the consequence, generally, of undue irritation of the kidney, by bad food or strong diuretics; and sometimes follows inflammation of the kidney. It can seldom be traced in the horse to any disease of the digestive organs. The treatment is obscure, and the result often uncertain. It is, evidently, increased action of the kidney, and therefore the most rational plan of treatment is to endeavour to abate that action; and nearly the same course should be pursued in the early stage of diabetes, as in actual

inflammation; but the lowering system should not be carried to so great an extent. To bleeding, purging, and counter-irritation, medicines of an astringent quality should succeed, as catechu, the powdered leaf of the whortle-berry, and opium, in doses of two drachms each of the two first, and half a drachm of the last. Very careful attention should be paid to the food. The hay and oats should be of the best quality; and green food, especially carrots, will be very serviceable.

THE BLADDER.

The urine separated by the blood is discharged by the minute vessels, of which we have spoken, into some larger canals, which terminate in a cavity or reservoir in the body of the kidney, called its *pelvis*; and thence is conveyed by a duct, called the *ureter*, to a larger reservoir, the *bladder*. It is constantly flowing from the kidney through the ureter; and were there not this provision for its detention, it would be incessantly and annoyingly dribbling from the animal. The bladder lies in, and, when distended by urine, nearly fills, the cavity of the great bones of the haunch, termed the *pelvis*. It has three coats—the outer one covering the greater part of it, and being a portion of the peritoneum; the muscular, consisting of two layers of fibres, as in the stomach; the external, running longitudinally, and the inner circularly, so that it may yield to the pressure of the urine as it enters, and contract again into an exceedingly small space as it runs out, and by that contraction assist in the expulsion of the urine. The inner or mucous coat contains numerous little glands which pour out a mucous fluid to defend the bladder from the acrimony of the urine. The bladder terminates in a small neck, round which is a strong muscle, keeping the passage closed, and retaining the urine until, at the will of the animal, or when the bladder contains a certain quantity of fluid, the muscular coat begins to contract, and, the lungs being filled with air, the diaphragm is rendered convex towards the intestines, and presses then on the bladder, and by these united powers, the fluid is forced through the sphincter muscle at the neck of the bladder, and escapes.

INFLAMMATION OF THE BLADDER.

There are two varieties of this disease, inflammation of the body of the bladder, and of its neck. The symptoms are nearly the same with those of inflammation of the kidney, except that there is rarely a total suppression of urine, and there is heat felt in the rectum over the situation of the bladder. The causes are the presence of some acrid or irritant matter in the urine, or of calculus or stone in the bladder. With reference to inflammation of the body of the bladder, mischief has occasionally been done by the introduction of cantharides or some other irritating matter to hasten the period of horsing in the mare. The treatment will be the same as in inflammation of the kidney, except that it is of more consequence that the horse should drink freely

of water or thin gruel, and that gruel or mucilage of any kind may, by one who understands the anatomy of the animal, be easily introduced into the bladder of the mare.

In inflammation of the neck of the bladder there is the same frequent voiding of urine in small quantities, generally appearing in an advanced stage of the disease, and often ending in almost total suppression. There is also this circumstance, which can never be mistaken by him who will pay diligent attention to the case, that the bladder is distended with urine, and may be distinctly felt under the rectum. It is spasm of the part, closing the neck of the bladder so powerfully, that the contraction of the bladder, and the pressure of the muscles, are unable to force out the urine.

Here the object to be attempted is sufficiently plain. This spasm must be relaxed. The most likely means to effect this is to bleed largely, and even to fainting. This will sometimes succeed, and there will be at once an end to the disease. To the exhaustion and loss of muscular power occasioned by copious bleeding, should be added the nausea consequent on phisic. Should not this speedily have effect, another mode of abating spasm must be tried. A drachm of the powdered opium, made into a ball or drink, may be given every two or three hours; while an active blister is applied externally. In the mare the bladder may be easily evacuated by means of a catheter in skilful hands; but owing to the curved direction of the penis, a catheter cannot be introduced into the bladder of a horse, without an operation to which a veterinary surgeon alone is competent.

STONE IN THE BLADDER.

The urine is a very compound fluid; in a state of health it contains a great many acids and alkalies variously combined, which under disease are increased both in number and quantity. It is very easy to conceive that some of these shall be occasionally separated from the rest, and assume a solid form both in the *pelvis* of the kidney, and in the bladder. This is known to be the case both in the human being and in the brute. These calculi or stones are in the horse found oftener in the kidney than in the bladder, contrary to the experience of the human surgeon. The explanation, of this, however, is not difficult. In the human being the kidney is situated above the bladder, and these concretions descend from the kidney to the bladder by their weight. The belly of the horse is horizontal, and the force of gravity can in no way affect the passage of the calculus, therefore it remains in the *pelvis* of the kidney, until it increases so much in size as often to fill it. We know not of any symptoms which would satisfactorily indicate the presence of a stone in the kidney; and if the disease could be ascertained, we are unable to say what remedial measures could be adopted.

The symptoms of stone in the bladder much resemble those of spasmodic colic, except that on careful inquiry it will be found that there has been much irregularity in the discharge of urine, and

occasional suppression of it. When fits of apparent colic frequently return, and are accompanied by any peculiarity in the discharge of urine, the horse should be carefully examined. He should be thrown. If there be stone in the bladder, it will, while the horse lies on its back, press on the rectum, and may be distinctly felt if the hand be introduced into the rectum. Several cases have lately occurred of successful extraction of the calculus; but here it will be necessary to have recourse to the aid of a veterinary practitioner.

Many horses occasionally void a considerable quantity of gravel, sometimes without inconvenience, at others with evident spasm or pain. A diuretic might here be useful, as increasing the flow of urine, and possibly washing out the concretions before they become too numerous or bulky.

The urine having passed the neck of the bladder, flows along the urethra, and is discharged. The sheath of the penis is sometimes considerably enlarged. When at the close of acute diseases, there are swellings and effusions of fluid, under the chest and belly, this part seldom escapes. Diuretics, mixed with a small portion of cordial medicine, will be beneficial, although in some extreme cases slight scarifications may be necessary. The inside of the sheath is often the seat of disease; the mucous matter naturally secreted there to defend the part from the acrimony of the urine, accumulates and becomes exceedingly offensive, and produces swelling, tenderness, and even excoriation, and sometimes considerable discharge. A little fomentation with warm water, and the cleansing of the part with soap and water, aided perhaps by a diuretic ball, will speedily remove every inconvenience. Carters are much too apt to neglect cleanliness in this respect.

CHAPTER VI.

THE FORE LEGS.

WE arrive now at those parts of the frame most essentially connected with the action and value of the horse, and oftenest, and most annoyingly, the subjects of disease. The extremities contain the whole apparatus of motion, and it is with the action, and speed, and strength of the horse that we are most concerned.

We begin with the fore extremity, and with its upper part,

THE SHOULDER.

The *scapula*, or shoulder-blade, situated forward on the side of the chest, is a bone of a somewhat triangular shape, with its apex or point downward, and its base or broad part upward. The point lies between the first and second ribs; the hinder part of the base reaches as far back as the seventh rib; it therefore extends obliquely along the

chest. It is divided, externally, into two unequal portions by a ridge or spine running through almost the whole of its extent, and designed as we shall presently show, for the attachment of important muscles. The broad or upper part having no muscles of any consequence attached to it, is terminated by cartilage.

The muscles of the hinder legs are principally concerned in the motion of the horse. They impel the machine forward, and the main uses of the fore extremities are to lift the fore part of the horse from the ground, that it may be thus impelled to throw forward the legs as far as possible that they receive this weight at due distance, and to support the force and shock of that weight when it reaches the ground. We will inquire as we proceed how far one or all of these objects are accomplished.

The shoulder-blade is united to the chest by muscle alone. There is a large muscle, with very remarkable tendinous fibres, and of immense strength (the *serratus major*, greater saw-shaped muscle), attached to the chest, and to the extensive smooth internal surface of the shoulder-blade, and by which, assisted, or rather strengthened, by the muscles of the breast, the weight of the body is supported, and the shock of the widest leap, or the most rapid motion, sustained. Had there been a bony union between the shoulder and the body, the vital parts contained in the chest could not have endured the dreadful shock which they would occasionally have experienced; nor could any bone have long remained whole if exposed to such violence. The muscles within the shoulder-blade act as powerful and safe springs. They yield, as far as necessary, to the force impressed upon them; by their gradual yielding they destroy the violence of the shock, and then, by their elastic power, immediately regain their former situation.

SPRAIN OF THE SHOULDER.

In some violent and unexpected shock these muscles are occasionally injured. Although we do not believe that, in one case in twenty, the farrier is right when he talks of his shoulder-lameness, yet it cannot be denied, that the muscles of the shoulder, are occasionally sprained. This is effected oftener by a slip or side-fall, than by fair, although violent exertion. It is of considerable importance to be able to distinguish this shoulder-lameness from injuries of other parts of the fore extremity. We shall look in vain for much tenderness, or heat or swelling: it is a sprain of muscles deeply seated, and where these symptoms of injury cannot possibly exist. If, on standing before the horse, and looking at the size of the two shoulders, or rather their points, one should appear evidently larger than the other, we must not consider this as indicative of sprain of the muscles of the shoulder. It probably arises from bruise of the point of the shoulder, which a slight examination will determine; or the whole of the limb, this portion of which is enlarged, may be sound, while the other may be shrunk from want of equal exertion, arising from injury of long standing. The heat and tenderness, if there be any, will be found

within the arm, close to the chest; and will belong more to the muscles of the breast than to those under the shoulder.

The symptoms, however, of shoulder-lameness can scarcely be mistaken; and, when we relate them, the farmer will recollect, that they very seldom occurred when the village-smith pointed to the shoulder as the seat of disease, and punished the animal for no purpose. In sprain of the shoulder the horse will evidently suffer extreme pain while moving, and the muscle underneath being inflamed and tender, he will extend it as little as possible. *He will drag his toe along the ground.* It is in the lifting of the foot that the shoulder is principally moved: if the foot be lifted high, let the horse be ever so lame, the shoulder is little, if at all affected. The lame limb is suffered to bear the weight a much shorter time in this than in any other kind of lameness. In sprain of the back sinews, it is only when the horse is in motion that the injured parts are put to most pain; the pain is greatest here when the weight rests on the limb, and, therefore, there is a peculiar quickness in catching up the limb, in shoulder-lameness, the moment the weight is thrown on it. This is particularly evident when the horse is going down hill, and the injured limb bears an additional portion of the weight. In the stable, too, when the horse points or projects one foot before the other, that foot is usually flat on the ground. In shoulder lameness the toe alone rests on the ground. The circumstance which most of all characterizes this affection, is that when the foot is lifted, and then brought considerably forward, the horse will express great pain, which he will not do if the lameness be in the foot or the leg. We have dwelt longer on this point, that our readers may be enabled to put to the test the many cases of shoulder-lameness, which exist only in the imagination of the groom or the farrier.

In sprain of the internal muscles of the shoulder, few local measures can be adopted. The horse should be bled from the vein on the inside of the arm, because the blood is then abstracted more immediately from the inflamed part. A dose of physic should be given, and fomentations applied, and principally on the inside of the arm, close to the chest; while the horse is kept as quiet as possible. The injury is too deeply seated for external stimulants to have very great effect, yet a blister will very properly be resorted to, if the lameness is not speedily removed. The *swimming* of the horse is an inhuman practice; it tortures the animal, and increases the inflammation. The *pegging* of the shoulder (puncturing the skin, and blowing into the cellular structure beneath, until it is considerably puffed up), is another relic of ignorance and barbarity.

SLANTING DIRECTION OF THE SHOULDER.

It will be observed, that the shoulder-blade and the lower bone of the shoulder are not connected together in a straight line, but form a very considerable angle with each other.

That the stride in the gallop, or the space passed over in the trot,

be extensive, it is necessary that the fore part of the animal should be considerably elevated. The shoulder, by means of the muscles which extend from it to the inferior part of the limb, is the grand agent in effecting this. Just in proportion as the point of the shoulder is brought forward and elevated, will be the forward action and elevation of the limb, or the space passed over at every effort. At each contraction of the muscles which extend from the shoulder-blade to the bone of the arm, will the point of the shoulder be projected and elevated. A slanting shoulder is indispensable in a horse from which good action and considerable speed are required.

The slanting shoulder accomplishes another very useful object. The muscles extending from the shoulder-blade to the lower bone of the shoulder are the powers by which motion is given to the whole of the limb. The extent and energy of that motion depend much on the force exerted or the strength of the muscle; but there are circumstances in the relative situations of the different bones which have far greater influence.

In the upright shoulder, the shoulder-blade and the bone of the arm are almost in a straight line, and the real action and power of the muscles are most strangely diminished. In this point of view the oblique shoulder is most important. It not only gives extensive action, but facility of action; the power of the muscles is more than doubled by being exerted in a line approaching so much nearer to a perpendicular.

There is yet another advantage of the oblique shoulder. The point of the shoulder is projected forward; and therefore the pillars which support the fore part of the horse are likewise placed proportionably forward, and they have less weight to carry; and are exposed to less concussion, and especially concussion in rapid action. The horse is also much safer; for having less weight lying before the pillars of support, he is not so likely to have the centre of gravity thrown before and beyond them by an accidental trip; or, in other words, he is not so likely to fall; and he rides more pleasantly, for there is far less weight bearing on the hand of the rider, and annoying and tiring him. It likewise happens unfortunately that nature, as it were to supply the deficiency of action and of power in an upright shoulder, has accumulated on it more muscle, and therefore the upright shoulder is proverbially thick and cloddy; and the muscles of the breast which were designed to strengthen the attachment of the shoulders to the chest, and to bind them together, must, when the point of the shoulder lies backward, and under the horse, be proportionably thickened and strengthened, and the horse is thus still more heavy before, more unpleasant, and more unsafe to ride.

Then, ought every horse to have an oblique shoulder? No! We have been speaking of those which are designed to ride pleasantly, or from which extensive and rapid action is required. In them we have said that an oblique shoulder is indispensable: but there are others which are never ridden; whose pace is slow, and who have nothing to do but to throw as much weight as possible into the collar. To them

an upright shoulder is an advantage, because its additional thickness gives them additional weight to throw into the collar, which the power of their hinder quarters is fully sufficient to accomplish; and because the upright position of the shoulder gives that direction to the collar which enables the horse to act upon every part of it; and that inclination of the traces which will enable his weight or power to be most advantageously employed.

MUSCLE ON THE OUTSIDE OF THE SHOULDER.

The (*trapezius*), quadrangular muscle rises from the longer bones of the withers, broadly and strongly, and from the ligament of the neck, and narrowing below, and terminating almost in a point, is inserted into a prominent part of the spine or ridge of the shoulder-blade. It occupies the space between the withers and the upper part of the shoulder-blade, and is large and strong in proportion to the height of the withers, and the slanting of the shoulder. Its use is evidently to support the shoulder, to raise it, and likewise to draw it backward; therefore, constituting one of the most important muscles connected with the action of the horse, and illustrating the advantage of high withers and a slanting shoulder.

THE LOWER BONE OF THE SHOULDER.

Forming a joint with the shoulder-blade at the point of the shoulder is the *humerus*, or lower bone of the shoulder. It is a short strong bone, slanting backward in an opposite direction to the shoulder-blade. At the upper part it has a large round head, received into the shallow cavity of the shoulder-blade. It has several protuberances for the insertion of muscles, and is terminated below by two *condyles* or heads, which in front receive the principal bone of the arm between them as in a groove, thus adding to the security and strength of the joint, and limiting the action of this joint, and of the limb below, to mere bending and extension, without any side motion. Farther behind, these heads receive the elbow deep between them, to give more extensive action to the arm. In a well-formed horse this bone can scarcely be too short, in order that the fore-legs may be as forward as possible, for reasons at which we have already glanced; and because, when the lower bone of the shoulder is long, the shoulder must be too upright. Dislocation can scarcely occur in either of the attachments of the bone, and fracture of it is almost impossible. The lower bone of the shoulder, and the shoulder-blade, are by horsemen confounded together, and included under the appellation of the *shoulder*, and in compliance with general usage we have described them as combining to form the shoulder.

Among the muscles arising from the lower bone of the shoulder, are two short and very strong ones, the first proceeding from the upper part of this bone to the elbow, and the second from the internal part, and likewise going to the elbow, both of them being powerful agents in extending the leg.

In front, is one of the muscles of the lower bone of the shoulder, the *external one*, employed in bending the arm; arising from the inner and back part of the neck and body of the lower bone of the shoulder, turning obliquely round that bone, and inserted into the inner and upper part of the bone of the arm.

THE ARM.

The *arm* extending from the elbow to the knee, consists, in the young horse, of two distinct bones. The long and front bone, called the *radius*, is nearly straight, receiving into its upper end the lower heads of the lower bone of the shoulder; and the lower end corresponding with the upper layer of the bones of the knee. The short and hinder bone is called the *ulna*. It has a very long and powerful projection, received between the heads of the lower bone of the shoulder, and is called the elbow; it then stretches down, narrowing by degrees to below the middle of the front bone, where it terminates in a point. The two bones are united together by cartilage and ligament, but these are by degrees absorbed and changed to bone, and before the horse becomes old the whole of the arm consists of one bone only.

A full and swelling fore-arm is the characteristic of every thoroughbred horse, and for speed and continuance he is unequalled. Whatever other good points a horse may possess, if the arm be narrow in front and near the shoulder, flat on the side, and altogether poor in appearance, that horse is radically defective: he can neither raise his knee for rapid action, nor throw his legs sufficiently forward.

The arm should likewise be long. In proportion to the length of the muscle is the degree of contraction of which it is capable; and in proportion to the degree of contraction in the muscle will be the extent of motion in the part of the limb beneath. A racer, with a short arm, would be sadly deficient in stride; a hunter, with the same defect, would not be able to double his legs well under him in the leap. There is, however, a medium in this, and the advantage of length in the arm will depend on the use to which the horse is applied. The lady's horse, the cavalry horse, every horse in which prancing action is esteemed a beauty, and in which utility is, to a certain degree, sacrificed to appearance, must not be too long in the arm. If he be long there, he will be proportionably short in the leg; and although this is an undoubted excellence, whether speed or continuance be regarded, the short leg will not give the grand and imposing action which fashion may require: and, in addition to this, a horse with short legs may not have quite so easy action as another whose length is in the shank rather than in the arm.

THE KNEE.

The *Knee* constitutes the joint or joints between the arm and the shank or leg; and it is far more complicated than any joint we have yet considered. Beside the lower head of the bone of the arm, and the upper heads of the three bones of the leg, there are no less than

six other bones interposed, arranged in two rows, three in each row, and the seventh placed behind the other, to which an eighth is sometimes added.

What was the intention of this complicated structure? A joint between the elbow and the fetlock was absolutely necessary to the action of the horse. An inflexible pillar of that length could scarcely have been lifted from the ground, and certainly could not have been lifted far enough for rapid or safe motion. It was likewise necessary, that the interposing joint should be so constituted as to preserve this part of the limb in a straight direction, and should possess sufficient strength to resist all common work and accidents. Being in a straight direction, the shock or jar between the ends of the bones of the arm and the leg would be dreadful, and would speedily inflict irreparable injury. The heads of all bones are covered with elastic cartilage, to protect them from injury by concussion, but this would be altogether insufficient here. Six distinct bones, then, are placed here, each covered above and below by a thick coating of cartilage, connected together by strong ligaments, but separated by fluids and membranes interposed. The concussion is thus spread over the whole of them—shared by the whole of them; and, by the peculiarity of their connexion, deadened and rendered harmless.

These six distinct bones, united to each other by numerous and powerful ligaments, will also afford a far stronger joint than the opposition of any two bones, however perfect and strong might be the capsular ligament, or by whatever other ligaments it could be strengthened. In addition to the connexion between the individual bones, there is a perfect capsular ligament here, extending from the bone of the arm to those of the leg; and the result of the whole is, that, although the centre of such a column must be the weakest part, and most liable to bow out and give way, the hardest work and the severest accidents produce little deformity, and no dislocation in the knee: nor do the shocks and jars of many a year cause inflammation or disease. It is an undeniable fact, that such is the perfect construction of this joint, and to so great a degree does it lessen concussion, that the injuries resulting from hard work are, almost without an exception, found below the knee.

The knee should be broad. It should present a very striking width, compared with the arm above, or the shank below. The broader the knee is, the more space there is for the attachment of muscles, and for the accumulation of ligamentous expansions and bands. In proportion to the breadth of the knee there will be more strength; and likewise the direction of some muscles will be less oblique, and those of others will be more removed from the centre of motion; and, in either case, much power will be gained.

BROKEN KNEES.

The treatment of broken knees is a subject of considerable importance, for many horses are sadly blemished, and others are destroyed, by wounds in the knee-joint. The horse, when falling, naturally

throws his knees forward; they receive all his weight, and are sometimes very extensively lacerated. The first thing to be done is, by very careful washing with warm water, to cleanse the wound from all gravel and dirt. It must then be ascertained whether the joint is penetrated. The grating of the probe on one of the bones of the knee, on the depth to which the probe enters the wound, will often too plainly indicate that the joint has been opened. Should any doubt exist, let a linseed-meal poultice be applied. This will at least act as a fomentation to the wound, and will prevent or abate inflammation; and when, twelve hours afterwards, it is taken off, the *synovia*, or *joint-oil*, in the form of a glairy, yellowish, transparent fluid, will be seen, if the capsular ligament has been penetrated. Should doubt remain after the first poultice, apply a second.

The opening of the joint being ascertained, the first and immediate care is to close the orifice; for the fluid which separated and lubricated the bones of the knee being suffered to flow out, they will be brought into actual contact with each other; they will rub upon each other; the delicate membrane with which they are covered will be highly inflamed; the constitution will be speedily affected, and a degree of fever will ensue that will destroy the horse: and, in the mean time, of all the tortures that can be inflicted on the poor animal, none can equal that which accompanies inflammation of the membranes lining the joints.

The manner of closing the orifice must be left to the judgment of the veterinary surgeon, who alone is capable of properly treating such a case. It may be affected by a compress enclosing the whole of the wound, and not to be removed for many days; or it may be attempted by the old and generally successful method of applying the hot iron over the wound, and particularly over the spot where the ligament appears to be lacerated. A poultice may then be placed on the part, and the case treated as a common wound. Should the joint-oil continue to flow the iron may be applied a second, or even a third time. By the application of the iron, so much swelling is produced on the immediate puncture, and in the neighbouring parts, as mechanically to close and plug up the orifice.

If, however, the opening into the joint be extensive, and the joint oil continues to flow, and the horse is evidently suffering much pain, humanity will dictate that he should be destroyed. The case is hopeless. A high degree of fever will ere long carry the animal off, or the inflammation will cause a deposit of matter in the cavity of the joint which will produce incurable lameness.

The pain caused by the iron is doubtless great; it is, however, necessary: but let no reader of 'The Horse' permit the torturing experiments of the farrier to be tried, who will frequently *inject* stimulating fluids, and even oil of vitriol, into one of the most sensible and irritable cavities in the whole frame.

A person well acquainted with the anatomy of the part will judge of the probability of a favorable result, not merely by the extent, but

by the situation of the wound. If it is low down and opposite to the bottom row, a small opening into the joint will be easily closed; a larger one need not cause despair, because there is little motion between the lower row and the bones of the leg. If it be high up, there is more danger, because there is more motion. If it be situated opposite to the union of the two rows, the result is most to be dreaded, because between these is the principal motion of the joint, and that motion would not only disunite and irritate the external wound, but cause dreadful friction between the bones brought into actual contact with each other, through the loss of the joint oil.

When the skin has been lacerated, although the wound may be healed, some blemish will remain. The extent of this blemish will depend on the extent and nature of the original wound, and more especially on the nature of the treatment which has been adopted. Every caustic application will destroy more of the skin, and leave a larger mark. Should the blemish be considerable, a mild blister may be applied over the part, after the wound has healed. It will stimulate the hair to grow more rapidly and thickly round the scar, and particularly hair of the natural colour; and by contracting the skin it will lessen the scar itself. Many persons have great faith in ointments, which are said to promote the growth of the hair. If they have that property, it must be from stimulating the skin, in which the roots of the hair are embedded. These ointments must contain a small portion of blistering matter, in the form of turpentine, or the Spanish-fly. The common application of gunpowder and lard may, by blackening the part, conceal the blemish, but can have no possible effect in quickening the growth of the hair.

In examining a horse for purchase, the knees are very strictly scrutinized. A blemish on them should not induce us at once to condemn the animal; for a bad rider, or the merest accident, may throw the safest horse. A broken knee, however, is a suspicious circumstance, and calls for the most careful observation of the make and action of the horse. If it be accompanied by a thick and upright shoulder, and legs far under the horse, and low slovenly action, he is unwise who does not take the hint: this faulty conformation has produced its natural consequence. But if the shoulder be oblique, and the withers high, and the fore-arm strong, the good judge will not reject the animal, because he may have been accidentally thrown.

THE LEG.

The part of the limb between the knee and the fetlock consists of three bones—a large one before called the *cannon* or *shank*, and two smaller or *splint* bones behind. The shank-bone is rounded in front, and flattened, or even concave behind. It is the straightest of the long bones, as well as the most superficially situated, for in some parts it is covered only by the skin. The upper head is flat, with slight depressions corresponding with the lower row of the bones of the knee. The lower head is differently and curiously formed. It resembles a double

pulley. There are three elevations, the principal one in the centre, and one on each side; and between them are two slight grooves; and these so precisely correspond with deep depressions and slight prominences in the upper head of the larger pastern, and are so enclosed and guarded, by the elevated edges of that bone, that when the shank-bone and the pastern are fitted to each other, they form a perfect hinge: they admit of the bending and extension of the limb, but of no lateral or side motion; which is a circumstance of very great importance in a joint so situated, and having the whole weight of the horse thrown upon it.

The smaller bones are placed behind the larger on either side; a slight projection only of the head of each can be seen in front. The heads of these bones are enlarged, and receive part of the weight conveyed by the lower row of the bones of the knee. They are united to the larger bone by the same kind of substance which is found in the colt between the bone of the elbow and the main bone of the arm; and which is designed, like that, by its great elasticity, to lessen the concussion or jar when the weight of the animal is thrown on them. They reach from one-half to two-thirds of the length of the shank-bone, and, through their whole extent, are united to it by this substance, but, as in the elbow, from the animal being worked too soon, or too violently, inflammation ensues, and bony matter is deposited in the room of the ligamentous; and a bony union takes place instead of the natural one. There is no doubt that the ease of motion is somewhat lessened by this substitution of bone, but other elastic principles are probably called into more powerful action, and the value of the horse is not perceptibly impaired; although it is hard to say what secret injury may be done to the neighboring joints, and the cause of which, lameness appearing at a distant period, is not suspected.

In this process, however, mischief does often immediately extend to the neighboring parts. The disposition to deposit bone reaches beyond the circumscribed space between the larger and smaller bones of the leg; and a tumour, first callous and afterwards bony, is found with part of its base resting on the line of union between these bones. This is called a

SPLINT.

The splint is invariably found on the outside of the small bone, and generally on the inside of the leg. Why it should appear on the outside of the small bones it is difficult to explain, except that the space between these bones is occupied by an important mechanism, which will be presently described; and, as in the case of abscess, a natural tendency was given to them to determine outward, that vital parts may not be injured. The cause of their almost exclusive appearance on the inside of the leg admits of easier explanation. The inner splint-bone is placed nearer the centre of the weight of the body than the other, and, from the nature of its connexion with the bones of the knee, actually receives more of the weight than does the outer bone,

and therefore is more liable to injury, and inflammation, and this consequent deposit of bone. The inner bone receives the whole of the weight transmitted to one of the small bones of the knee. It is the only support of that bone. A portion only of one of the bones rests on the outer splint bone, and the weight is shared between it and the shank. In addition to this, it is the absurd practice of many smiths to raise the outer heel of the shoe to an extravagant degree, which throws still more of the weight of the horse on the inner splint-bone. These tumours occasionally appear on other parts of the shank-bone, being the consequence of violent blows, or other external injuries.

When the splint is forming, the horse is frequently lame. The periosteum or membrane covering the bone is painfully stretched; but when this membrane has accommodated itself to the tumour that extended it, the lameness subsides and altogether disappears, unless the splint be in a situation in which it interferes with the action of some tendon or ligament, or in the immediate neighborhood of a joint. Pressing upon a ligament or tendon, it may cause inflammation of those substances; or, being close to a joint, it may interfere with its action. Splints, then, do not necessarily cause unsoundness, and may not lessen in the slightest degree the action or value of the horse.

The treatment of splints, if it be worth while to meddle with them, is exceedingly simple. The hair should be closely shaved off round the tumour; a little strong mercurial ointment rubbed in for two days; and this should be followed by an active blister. If the splint be of recent formation, it will usually yield to this, or to a second blister. Should it resist these applications, it can rarely be advisable to cauterize the part, unless the tumour interferes materially with the action of the suspensory ligament; for it not unfrequently happens, that, although the splint may have apparently resisted this treatment, it will afterwards, and at no great distance of time, begin rapidly to lessen, and quite disappear. There is also a natural process by which the greater part of splints disappear when the horse gets old.

As for the old remedies, many of them brutal enough,—bruising the splint with a hammer, boring it with a gimlet, chipping it off with a mallet, sawing it off, slitting down the skin and periosteum over it, sweating it down with hot oils, and passing setons over it,—the voice of humanity, and the progress of science, will consign them to speedy oblivion.

The inside of the leg, immediately under the knee, and extending to the head of the inner splint-bone, is subject to injury from what is termed the *speedy cut*. A horse with high action, and in the fast trot, violently strikes this part either with his hoof or the edge of the shoe. Sometimes bony enlargement is the result, at others great heat and tenderness; and the pain from the blow seems occasionally to be so great that the horse drops as if he were shot. The only remedy is to take care that no part of the shoe projects beyond the foot; and to let the inner side of the shoe, have but one nail, and that near the toe. This part of the hoof, being unfettered with nails, will expand as

comes in contact with the ground, and contract when in air and relieved from the pressure of the weight of the body; and although this contraction is to no great extent, it will be sufficient to carry the foot harmlessly by the leg. Care should likewise be taken that the shoe be of equal thickness at the heel and the toe, and that the bearing be equal on both sides.

Immediately under the knee we find one of those ligamentous rings by which the tendons are so usefully bound down and secured; but if the hinder bone of the knee, the *trapezium*, be not sufficiently prominent, this ring will confine the flexor tendons of the foot too tightly, and the leg will be very deficient in depth under the knee. This is called being *tied in below the knee*. Every horseman recognizes it as a most serious defect. It is scarcely compatible with speed, and most assuredly not with continuance. Such a horse can not be ridden far and fast without serious sprain of the back sinews. The reason is plain: the pressure of the ring will produce a degree of friction inconsistent with the free action of the tendons; more force must, therefore, be exerted in every act of progression; and, although the muscles are powerful, and sufficiently powerful for every ordinary purpose, the repetition of this extra exertion will tire and strain them. A more serious evil, however, remains to be stated. When the back sinews or tendons are thus tied down, they are placed in a more oblique direction, and in which the power of the muscles is exerted with greater disadvantage; and, therefore, both for extraordinary, and even ordinary action, a greater degree of exertion is required, and fatigue and sprain will frequently result. There are few more serious defects than this tying-in of the tendons immediately below the knee. The fore-leg may be narrow in front, but it must be deep at the side, in order to render the horse valuable; for then only will the tendons have free action, and the muscular force be exerted in the most advantageous direction. The recollection of the reader will convince him, that there are few good race-horses whose legs are not deep below the knee. If there are exceptions, it is because their exertion, although violent, is but of short duration. The race is decided in a few minutes; and, during that little period, the spirit and energy of the animal may successfully struggle with the disadvantages of form; but where great and long-continued exertion is required, as in the hackney, no strength can long contend against this palpably disadvantageous misapplication of muscular power.

As they descend the back part of the leg, the tendons of the perforated and perforating flexor muscle should be far and distinctly apart from the shank-bone. There should be space free from thickening for the finger and thumb on either side to be introduced between them and the bone, and that extending from the knee to the fetlock. In a perfect leg—and towards its lower part, there should be three distinct and perfect projections visible to the eye, as well as recognizable by the finger, the sides of the shank-bone, the most forward of the three; next, the suspensory ligament; and hindmost of all, the flexor ten-

dons. When these are not to be distinctly seen or felt, or there is considerable thickening about them and between them, and the leg is round instead of flat and deep, there has been what is commonly, but improperly, called,

SPRAIN OF THE BACK-SINEWS.

These tendons are enclosed in a sheath of dense cellular substance, to confine them in their situation, and to defend them from injury. Between the tendon and the sheath there is a mucous fluid, to prevent friction: but when the horse has been overworked, or put to sudden and violent exertion, the tendon presses upon the delicate membrane lining the sheath, and inflammation is produced, and a different fluid is thrown out, which *coagulates*, and adhesions are formed between the tendon and the sheath, and the motion of the limb is more difficult and painful. At other times, from violent or long-continued exertion, some of the fibres which tie the tendons down are ruptured. A slight injury of this nature is called a sprain of the back-sinews or tendons, and when it is more serious, the horse is said to have *broken down*. It should be remembered, however, that the *tendon* can never be sprained, because it is inelastic and incapable of extension; and the tendon, or its sheath, are scarcely ever ruptured, even in what is called breaking down. The first injury is confined to inflammation of the sheath, or rupture of a few of the attaching fibres. The inflammation of the part, however, is often very great, the pain intense, and the lameness excessive. The anguish expressed at every bending of the limb, and the local swelling and heat, will clearly indicate the seat of injury.

In every serious affection of this kind, care should be taken that the local inflammation does not produce general disturbance of the system; and, therefore, the horse should be bled and physicked. The bleeding may be at the toe, by which an important local, as well as general effect will be produced. The vessels of the part will be relieved, while fever will be prevented. Let not the bleeding be performed in the usual farrier's way of first paring down the sole, and then taking out a piece at the toe of the frog; in which case a wound is made often difficult to heal, and through which fungous granulations from the sensible parts beneath will obstinately spring: but after the sole has been well thinned, let a groove be cut with the rounded head of a small drawing-knife, at the junction of the sole and the crust. The large vein at the toe will thus be opened, or the groove may be widened backward until it be found. When the blood begins to appear, the vein may be more freely opened, by a small lancet, thrust horizontally under the sole, and almost any quantity of blood may be easily procured. The immersion of the foot in warm water will cause the blood to flow more rapidly. When a sufficient quantity has been drawn, a bit of tow may be placed in the groove, and the shoe tacked on. The bleeding will be immediately stopped, and the wound will readily heal.

As a local application, let no hot farrier's oil come near the part, but let the leg be well fomented with warm water two or three times in the day, and half an hour at each time; and, between the fomentations, let the leg be enclosed in a poultice of linseed-meal. Any herb that pleases the owner may be added to the fomentation, or vinegar or Goulard's extract to the poultice; but the beneficial effect of both depends simply on the warmth of the water and the moisture of the poultice. The first object which the surgeon has in view, is to abate the inflammation of the part, and no means are so likely as these to effect that purpose. Every stimulating application will infallibly aggravate the mischief.

The horse beginning to put his foot better to the ground, and to bear pressure on the part, and the heat having disappeared, the object to be accomplished is changed; recurrence of the inflammation must be prevented, the enlargement must be got rid of, and the parts must be strengthened. The two latter purposes cannot be better effected than by using an elastic bandage—one of thin flannel will be the best. This will sustain and support the limb, while by few means are the absorbents sooner induced to take up the effused coagulable matter of which the swelling is composed, than by moderate pressure. If the bandage be kept wet with vinegar, to each pint of which a quarter of a pint of spirit of wine has been added, the skin will be slightly stimulated and contracted, and the cold produced by the constant evaporation will tend to subdue the remaining and deep-seated inflammation. This bandage should be daily tightened in proportion as the parts are capable of bearing increased pressure, and the treatment should be persisted in for a fortnight: if, at the expiration of that period, there be no swelling, tenderness, or heat, the horse may gradually, and very cautiously, be put to his usual work.

Should there, however, remain the slightest lameness or considerable enlargement, the leg must be blistered; and, indeed, it would seldom be bad practice to blister after a case of severe sprain: for the inflammation lies deep in the sheath of the tendons, and the part once sprained long remains weak, and subject to renewed injury, not only from unusual, but even ordinary exertion. If the blister be resorted to, time should be given for it to produce its gradual and full effect, and the horse should be turned out for one or two months; and here we must be permitted to repeat, that a blister should never be used while any heat or tenderness remains about the part, otherwise the slightest injury may be, and often is, converted into incurable lameness.

Very severe sprains, but much oftener sprains badly treated, may require the application of the cautery. If from long-continued inflammation the structure of the part is materially altered, if the swelling is becoming callous, or the skin is thickened and prevents the free motion of the limb, no stimulant short of the heated iron will be sufficient to rouse the absorbents to remove the injurious deposit. The principal use of firing is to rouse the absorbents to such increased

action that they shall take up and remove the diseased thickness of the skin, and likewise the unnatural deposit in the cellular substance beneath. The firing should be applied in straight lines, because the skin, contracting by the application of the cautery, and gradually regaining its elastic nature, will thus form the best bandage over the weakened part. Here, even more particularly than in the blister, time should be given for the full action of the firing. This removal of diseased matter is a work of slow progress. Many weeks pass away before it is perfectly accomplished; and, after firing, the horse should have at least a six months' run at grass, and it would be better if he could be given a twelve months' run at grass. When the animal has been set to work in a few weeks, and the enlargement remains, or lameness returns, the fault is to be attributed to the impatience of the owner, and not to the want of power in the operation, or skill in the operator.

Farriers are apt to blister immediately after firing. A blister may be useful six weeks or two months after firing, if lameness remains; but can never be wanted immediately after the severe operation of the cautery. If the iron has been skilfully applied, subsequent blistering inflicts on the animal, already sufficiently tortured, much unnecessary and useless pain, and should never be resorted to by him who possesses the slightest feeling of humanity.

In examining a horse for purchase, the closest attention should be paid to the appearance of these flexor tendons. If there be any thickness of cellular substance around them, that horse has been sprained violently, or the sprain has not been properly treated. This thickening will probably fetter the motion of the tendon, and dispose the part to the recurrence of inflammation and lameness. Such a horse, although at the time perfectly free from lameness, will be regarded with suspicion, and cannot fairly be considered as sound. He is only patched up for a while, and will probably fail at the close of the first day's hard work.

WIND-GALLS.

Approaching nearer to the fetlock, we occasionally find considerable enlargements, oftener on the hind leg than the fore one, which are denominated *wind-galls*. Between the tendons and other parts, and wherever the tendons are exposed to pressure or friction, and particularly about their extremities, little sacks or bags are placed, containing and suffering to ooze slowly from them a mucous fluid. From undue pressure, and that most frequently caused by violent action and straining of the tendons, these little bags become injured; they get inflamed, and grow large and hard. The tendons are mostly inserted into the neighbourhood of joints, and there is most motion and pressure, and consequently these enlarged mucous bags are of tenest found, about the joints. There are few horses perfectly free from them. When they first appear, and until the inflammation subsides, they may be accompanied by some degree of lameness; but

otherwise, except when they attain an enormous size, they do not interfere with the action of the animal, or cause unsoundness. The farriers used to suppose that they contained wind—hence their name, wind-galls; and hence the practice of opening them, by which dreadful inflammation has often been produced, and many a valuable horse destroyed.

A slight wind-gall will scarcely be subjected to treatment; but if these tumours are numerous and large, and seem to impede the motion of the limb, they may be attacked first by bandage. The roller should be of flannel, and soft pads should be placed on each of the enlargements, and bound down tightly upon them. The bandage may be wetted with the lotion recommended for sprain of the back-sinews. The wind-gall will often diminish or disappear by this treatment, but will too frequently return when the horse is again hardly worked. A blister is a more effectual remedy; and firing still more certain, if the tumours be sufficiently large and annoying to justify our having recourse to measures so severe. In bad cases the cautery is the only cure, for it will not only effect the immediate absorption of the fluid, and the reduction of the swelling, but, by contracting the skin, will act as a permanent bandage, and therefore prevent the reappearance of the tumour.

THE PASTERNS.

At the back of the shank just below the knee, and in the space between the two splint-bones, are found two extraordinary and important ligaments, extraordinary as being elastic, and important as being admirably adapted to obviate concussion. They have their origin from the head of the shank-bone, and also from the heads of the splint-bones, then descending down the leg, they fill the groove between the splint bones, but are not attached to either of them; a little lower down they expand on either side, and, approaching the pasterns, they divide, and are inserted into two little bones found at the back of the upper pastern, one on each side, called the *sessamoid* bones. They form a kind of joint both with the lower head of the shank-bone, and the upper pastern-bone, to both of which they are united by ligaments, but much more closely tied to the pastern than to the shank. The flexor tendons pass down between them through a large mucous bag to relieve them from the friction to which, in so confined a situation, they would be exposed. This ligament is continued over the sessamoids, and afterwards obliquely forward over the pastern to unite with the long extensor tendon, and downward to the perforated tendon, which it surrounds and fixes in its place, and also to the smaller pastern bone.

The pastern must be long in proportion to its obliquity, or the fetlock would be too close to the ground, and, in rapid action, would come violently upon it. It is necessary that the fetlock should be elevated a certain distance from the ground, and this may be effected either by a short and upright, or a long and slanting pastern. In proportion as the pastern is oblique or slanting, two con-

sequences will follow: less weight will be thrown on the pastern, and more on the sessamoid, and, in that proportion, jar or concussion will be prevented; and the jar of the weight which is thrown on the pastern will be lessened by the very obliquity of the bones, agreeably to what we have already stated of the angular construction of the limbs.

Every advantage has, however, to a certain extent, its corresponding disadvantages. In proportion to the obliquity or slanting of the pastern, will be the stress on the fetlock-joint, and, therefore, the liability of that joint to injury and strain; and also the liability to 'sprain of the back-sinews,' from the increased action and play of the flexor tendons; and likewise to injuries of the pastern-joints, for the ligaments will be weak in proportion to their length. The long and slanting pastern is an excellency in the race-horse, from the springiness of action and greater extent of stride by which it is accompanied. Experience among horses will alone point out the most advantageous direction of the pastern, for the purpose required; but the slightest observation will prove the necessity of considerable variety in the structure of this part. Let the reader imagine the heavy dray-horse with his short and upright pasterns, contending in the race; or the race-horse with his long and weak pasterns, endeavouring to dig his toe into the ground to move some heavy weight. The concussion is little in a cart-horse because his movements are slow, and therefore the upright and strong pastern is given to him, which he can force into the ground, and on which he can throw the whole of his immense weight. The oblique pastern is given to the race-horse because that alone is compatible with extent of stride and great speed. Except a horse for general purposes, and particularly for riding, be very hardly used, a little too much obliquity is a far less evil than a pastern too upright. The upright pastern is unsafe. The very circumstance which enables the dray-horse to throw himself into his collar, throws the riding-horse down; and while the jolting of the upright pastern is an insufferable nuisance to the rider, it is injurious to the horse, and produces many diseases in the feet and legs. A riding-horse with upright pasterns, will soon begin to knuckle over, even with ordinary work; and this will be followed by ringbone, ossification of the cartilages, and contracted feet.

RUPTURE OF THE SUSPENSORY LIGAMENT.

The suspensory ligament is sometimes ruptured by extraordinary exertion. The sessamoids are then let down, and the fetlock almost touches the ground. This is generally mistaken for rupture of the flexor tendon; but one circumstance will sufficiently demonstrate that it is the suspensory ligament which is concerned, viz. that the horse is able to bend his foot. Rupture of this ligament is a bad, and almost desperate case. The horse is frequently lame for life, and never becomes perfectly sound. Keeping him altogether quiet, bandaging the leg, and putting on a high-heeled shoe, will afford the most probable means of relief.

THE FETLOCK.

The fetlock-joint is a very complicated one, and from the stress which is laid on it, and its being the principal seat of motion below the knee, it is particularly subject to injury. There are not many cases of sprain of the back-sinew which are not accompanied by inflammation of the ligaments of this joint; and many supposed cases of sprain higher up are simple affections of the fetlock. It requires a great deal of care, and some experience, to distinguish the one from the other. The heat about the part, and the point at which the horse least endures the pressure of the finger, will be the principal guides. An affection of the fetlock-joint demands blistering more promptly and severely than one of the sheaths of the tendons.

GROGGINESS.

The peculiar knuckling over of the fetlock-joint, and tottering of the whole of the fore-leg, known by the name of *grogginess*, and which is so often seen in old and over-worked horses, is seldom an affection of either the fetlock or the pastern-joints simply, although these have their full share in the mischief that has been produced by tasking the poor animal beyond his strength. Sometimes it is difficult to fix on any particular joint; at others, it seems to be traced to a joint deep in the foot, where the flexor tendon runs over the navicular bone. It seems oftenest to be a want of power in the ligaments of the joints generally, produced by frequent and severe sprains, or by ill-judged and cruel exertion; and, in the majority of cases, admits of no remedy; especially as dissection often discovers ulceration within the joints, and of the membrane which lines the cartilage, and even of the cartilage itself, which it was impossible to reach or to remove.

CUTTING

The inside of the fetlock is often bruised by the shoe or the hoof of the opposite foot. Many expedients have been tried to remove this; the inside heel has been raised and lowered, and the outside raised and lowered; and sometimes one operation has succeeded, and sometimes the contrary; and there was no point so involved in obscurity, or so destitute of principles to guide the practitioner. The most successful remedy, and that which in the great majority of cases supersedes all others, is to put on a shoe, of even thickness from heel to toe; to let the bearing be perfectly level; and then to drive but one nail, and that near the toe, in the inside of the shoe, which is placed on the foot by which the injury is done; care being taken that the shoe shall not extend beyond the edge of the crest, and the crest being rasped a little at the quarters. There are some defects, however, in the natural form of the horse, which are the causes of cutting, and which no contrivance will remedy; as when the legs are placed too near each other, or when the feet are turned inward or outward. A horse with these defects should be carefully examined at the inside of the fetlock, and if there be any sore or callous places from cutting, there will be suffi-

cient reason for rejecting the animal. Some horses will cut when they are fatigued, and many colts will cut before they arrive at their full strength.

The *upper pastern* bone receives the lower pulley-like head of the shank-bone, and forms a hinge-joint admitting only of bending and extension, but not of side motion; it likewise articulates with the sesamoid-bones. Its lower head has two rounded protuberances, which are received into corresponding depressions in the lower pastern. On either side, above the pastern-joint, are roughened projections for the attachment of very strong ligaments, both the capsular ligaments, and many cross ligaments, which render the joint between the two pasterns sufficiently secure.

The *lower pastern* is a short and thick bone, with its larger head downward. Its upper head has two depressions to receive the protuberances on the lower head of the upper bone, bearing some resemblance to a pulley, but not so decidedly as the lower head of the shank-bone. Its lower head resembles the lower head of the other pastern, and has two prominences, likewise somewhat resembling a pulley, and by which it articulates with the coffin-bone; and a depression in front, corresponding with a projection in the coffin-bone; and also two slight depressions behind, receiving eminences in the navicular bone. Neither of these joints admit of any lateral motion. The ligaments of this joint, which is called the coffin-joint, are, like those of the pastern joint, exceedingly strong, both the capsular and the cross ones. The tendon of the extensor muscle is inserted into the fore part, both of the upper and lower pastern-bones, as well as into the upper part of the coffin-bone; and at the back of these bones the suspensory ligament is expanded and inserted, while a portion of it goes over the fore part of the upper pastern to reach the extensor tendon.

And now, having arrived at the foot, which is one of the most complicated and important parts in the frame of a horse, we shall defer the consideration of the coffin and navicular bones until we have described the hinder extremities. We may, however, observe that both these joints are subject to sprain, and particularly the coffin-joint.

SPRAIN OF THE COFFIN-JOINT.

The proof of this is when the lameness is sudden, and the heat and tenderness are principally felt round the coronet. Bleeding at the toe, physic, fomentation, and blisters are the usual means adopted. This lameness is not easily removed, even by a blister; and if removed, like sprains of the fetlock and of the back-sinews, it is apt to return, and, finally, produce a great deal of disorganization and mischief in the foot. This wrick, or sprain of the coffin-joint, sometimes becomes a very serious affair, not being always attended by any external swelling, and being detected only by heat round the coronet, the seat of the lameness is often overlooked by the groom and the farrier; and the disease is suffered to become confirmed before its nature is discovered. There is no species of lameness more confounded with

affections of the shoulder than this, because it is the custom of these ignorant and prejudiced persons to trace every lameness to the shoulder which is not palpably referable to another part.

From violent or repeated sprains of the pastern or coffin-joints, or extension of the ligaments attached to other parts of the pastern-bones, inflammation takes place in the periosteum, and bony matter is formed, which often rapidly increases, and is recognised by the name of

RINGBONE, AND POSITION OF THE LEGS.

Ringbone commences in one of the pasterns, and usually about the pastern-joint, but it rapidly spreads, and involves not only the pastern-bones, but the cartilages of the foot. When the first deposit is on the lower pastern, and on both sides of it, and produced by violent inflammation of the ligaments of the joints, it is recognised by a slight enlargement, or bony tumour on each side of the foot, and just above the coronet. This is more frequent in the hind foot than the fore, because, from the violent action of the hind legs in propelling the horse forward, the pasterns are more subject to ligamentary injury behind than before; yet the lameness is not so great, because the disease is confined principally to the ligaments, and the bones have not been injured by concussion; while from the position of the fore limbs and their exposure to concussion, there will generally be in them injury of the bones to be added to that of the ligaments. In its early stage, and when recognised only by a bony enlargement on both sides of the pastern-joint, or in some few cases on one side only, the lameness is not very considerable, and it is not impossible to remove the disease by active blistering, or by the application of the cauter: but there is so much wear and tear in this part of the animal, that the inflammation and the disposition to the formation of bone rapidly spread. The pasterns first become connected together by bone instead of ligament, and thence results what is called an ankylosed or fixed joint. Its motion is lost. From this joint the disease proceeds to the cartilages of the foot, and to the union between the lower pastern, and the coffin and navicular bones; and the motion of these parts likewise is impeded or lost, and the whole of this part of the foot becomes one mass of spongy bone. From this disposition to spread, (and at first round the pastern-joint, which is situated just above the coronet,) this disease has acquired the name of ringbone.

Ringbone is one of the most serious lamenesses with which the horse can be afflicted. It is unsoundness when existing in the slightest degree, for the lateral enlargement may speedily extend; and when the bony deposit begins to spread, the disease is incurable.

The fore-legs, when viewed in front, should be widest at the chest, and should gradually approach to each other as we descend towards the fetlock. The degree of width must depend on the purpose for which the horse is wanted. The legs of a heavy draught-horse can scarcely be too far apart. His rounded chest enables him to throw more weight into the collar; and being

Position of
the legs.

seldom, if ever required for speed, he wants not that occasionally increased expansion of chest which the circular form is not calculated to give. A hackney, and a coach-horse, should have sufficient expansion of the chest, or the legs sufficiently wide apart, to leave room for the play of the lungs; but depth more than roundness of chest is here required, because the deep chest admits of most expansion, when the horse, in rapid action, and the circulation proportionally quickened, needs more room to breathe: yet if the breast be too wide, there will be considerable weight thrown before, and the horse will be heavy in the hand, and unsafe.

Whether the legs are near to each other or wide apart, they should be straight. The elbow should not have the slightest inclination inward or outward. If it inclines towards the ribs, its action will be confined, and the leg will be thrown outward when in motion, and describe a curious and awkward curve; and this will give a peculiar rolling motion, unpleasant to the rider and unsafe to the animal. The toe will likewise be turned outward, which will not only prevent the foot from coming flat on the ground in its descent, but be usually accompanied by cutting, even more certainly than when the toe turns inward. If the elbow is turned outward, the toes will necessarily be turned inward, which is a great unsightliness, and to a certain degree injurious. The weight cannot be perfectly distributed over the foot; the bearing cannot be true; there will be undue pressure on the inner quarter, a tendency to unsafeness, and a disposition to splint and corn. The legs should come down perpendicularly from the elbow. If they incline backward and under the horse, there is undue stress on the extensor muscles; and the legs being brought nearer the centre of gravity, undue weight is thrown forward, and the horse is liable to knuckle over and become unsafe; if the legs have a direction forward, the flexor muscles are strained, and the action of the horse is awkward and confined. The toe should be found precisely under the point of the shoulder. If it be a little more forward, the horse will probably be deficient in action; if it be more under the horse, unsafeness will be added to still greater defect in going.

CHAPTER VII.

THE HIND LEGS.

THE HAUNCH.

In describing the hinder extremities, we must begin with the bones of the haunch. The haunch is composed of three bones. The first is the ilium, principally concerned in the formation of the haunch. Its extended branches behind the flanks are prominent in every horse, and when they are more than usually wide, the animal is said to be *ragged-hipped*. A branch runs up to the spine at the commencement

of the sacral vertebræ, and here the haunch-bones are firmly united with the bones of the spine. The ischium, or hip-bone, is behind and below the ilium. The pubis unites with the two former below and behind.

From the loins to the setting on of the tail, the line should be carried on almost straight, or rounded only in a very slight degree. Thus the haunch-bones will be most oblique, and will produce a corresponding obliquity, or slanting direction in the thigh-bone—a direction in which, as we stated when describing the fore-legs, the muscles act with most advantage. This direction of the haunch is characteristic of the thorough-bred horse; and, by the degree in which it is found, we judge as much as by any thing of the breeding of the animal.

The oblique direction of the haunch and thigh-bones, produced by the straightness of the line of the spine, does not, as is commonly supposed, afford increased surface for the attachment of muscles, but places the muscles in a direction to act with great advantage. It is in the advantageous direction, quite as much as in the bulk of the muscle, that the strength of the horse consists.

Width of haunch is a point of great consequence, for that actually affords more room for the attachment of muscles; and even though it should be so great as to subject the horse to the charge of being *ragged-hipped*, and may somewhat offend the eye, it is no detriment to action. If the loins be broad, and the horse be well ribbed home, the protuberances of the ilium can scarcely be too far apart. Many a ragged-hipped horse has possessed both fleetness and strength, but few which were narrow across the haunch could boast of the latter quality.

The opening through the centre of these bones, which constitutes the passage through which the young animal is expelled from the mother, is large in the mare, and in every quadruped, because there cannot be, from the form of the animal, any danger of abortion from the weight of the fœtus pressing on the part.

The only parts of these bones exposed to injury or fracture are the tuberosities or prominences of the haunch. A fall or blow may chip off and disunite a portion of them. There are no means of forcibly bringing the disunited parts together, and retaining them in their natural position. Nature, however, will cause them to unite, yet generally attended by deformity and lameness. A *charge*, or very strong adhesive plaister, across the haunch may be useful, as helping, in some slight degree, to support the parts, and hold them together.

THE THIGH.

In the lower and fore part of the hip-bones is a deep cavity or cup for the reception of the head of the upper bone of the thigh. Although in the action of the hind legs there cannot be the concussion to which the fore-legs are exposed (for the weight of the body is never thrown violently upon them), yet in the powerful action of these limbs there is much strain on the joints, and we shall find that there are, in all of them, admirable provisions against injury. The head of the upper

bone of the thigh is received into a deep cup (the *acetabulum*), by which it is surrounded on every side, and dislocation from which would seem almost impossible. But the bony cup may give way? No! provision is made against this: all three of the haunch bones unite in the formation of this cup, and the sutures by which these bones are held together are of such a nature, that one would think no shock, or exertion, or accident, could disunite them. There is even something more added to make the attachment doubly sure. Besides the usual capsular and other ligaments, a singularly strong one rises from the base of the cup, and is inserted into the head of the upper bone of the thigh, and would seem to render separation or dislocation altogether impossible: and yet such is the amazing power of the muscles of the hind limb, that with all these attachments, sprain of the ligaments of the haunch joint, or the *round-bone*, as horsemen call it, and even dislocation of the head of the thigh bone, are occasionally found.

The upper bone of the thigh we should expect to be, from the powerful muscles that are attached to it, a very strong bone, and it is both the largest and strongest in the frame. It is short and thick, and exhibits the most singular prominences, and roughnesses, and hollows, for the insertion of the immense muscles which belong to it. Four prominences, in particular, called by anatomists *trochanters*, two on the outside, one on the inside, and one near the head of the bone, afford attachment to several important muscles. The head of the bone is placed at right angles with its body, by which this important advantage is gained, that the motion of the thigh-joint is principally limited to that of bending and extending, although it possesses some slight lateral, and even some rotatory or round action. The lower head of the upper bone of the thigh is complicated in its form. It consists of two prominences, which are received into corresponding depressions in the next bone, and a hollow in front, in which the bone of the knee plays as over a perfect pulley.

STRAIN OF THE ROUND BONE.

The joint of the upper bone of the thigh with the haunch is commonly called the *whirl* or *round* bone. It has been stated, that it has, in some rare instances, been dislocated and fractured: it is, however, much oftener sprained, but not so often as the groom or farrier imagine. There is nothing peculiar in the lameness to detect injury of this part, except that frequently the horse will drag his leg after him on the toe. Injury of the round bone, or hip-joint, will be principally discovered by heat and tenderness in the situation of the joint. A part so deeply seated is treated with difficulty. Fomentations should first be used to abate the inflammation, and after that an active blister should be applied. Strains of this joint are not always immediately relieved, and the muscles of the limb considerably waste; and therefore it may be necessary to repeat the blister, while absolute rest should accompany every stage of the treatment. It may even be

requisite to fire the part, or, as a last resort, a *charge* may be put over the joint, and the horse turned out for two or three months.

THE STIFLE.

The upper bone of the thigh is united to the lower by a somewhat complicated joint. It terminates by two round prominences behind, which are received into slight depressions on the upper surface of the lower bone; and in front is a curious groove over which plays a small irregular bone, the patella or stifle-bone. The whole is called by farriers the stifle joint. The patella, answers to the kneecap in the human subject. Some of the tendons of the strongest muscles of the upper bone of the thigh are inserted into it, and continued from it over the lower bone. This important joint is hereby much strengthened; for the proper ligaments between the upper and lower bones, and these additional tendons and ligaments from the patella, must form altogether a very powerful union. The patella likewise answers another and even more important purpose. The tendons of some strong muscles are inserted into it. When these muscles are not in action, the patella lies in the groove which nature has contrived for it; but when they begin to contract, it starts from its partial hiding-place, becomes prominent from the joint, and alters the line of direction in which the muscles act: it increases the angle, and thus very materially increases the power of the muscles.

The lower bone of the thigh is double: the larger portion, in front, extending from the stifle to the hock, is called the tibia. The smaller bone, or fibula, behind, reaches not more than a third of the way down. It is united to the shank-bone, like the splint-bone, by a cartilaginous substance, which soon is changed for bone. Of the use of these little bones we cannot speak.

The lower bone of the thigh forms an angle with the upper, the reverse of that which exists between the upper bone and the pelvis. The object of this is two fold,—to obviate concussion, and to give a direction to the muscles favorable to their powerful action; and in proportion to the acuteness of the angle, or the degree in which the stifle is brought under the horse, will these purposes be accomplished. There is a great deal of difference in this in different horses, and the construction of this part of the frame is a matter worthy of more regard than is generally paid to it.

This part of the thigh should likewise be long. In proportion to the length of the muscle is the degree of contraction of which it is capable; and in proportion to the contraction of the muscle is the extent of motion in the limb: but it is still more necessary that this part of the thigh should have plenty of muscle, that strength may be added to this extent or compass of motion. We should not expect much endurance from a horse with a thin arm: a horse with thin and lanky thighs cannot be good for any thing.

The stifle joint is not often subject to sprain. The heat and tenderness will guide to the seat of injury. Occasionally, dislocation of

the patella has occurred, and the horse drags the injured limb after him, or rests it on the fetlock;—the aid of a veterinary surgeon is here requisite. The muscles of the inside of the thigh, generally, have sometimes been sprained: this may be detected by diffused heat, or heat on the inside of the thigh above the stifle;—rest, fomentations, bleeding, and physic, will be the proper means of cure.

THOROUGH-PIN.

We have observed that there are placed in the neighborhood of joints, certain bags, containing a mucous fluid for the purpose of lubricating the parts, and that these sometimes become inflamed and enlarged. We have spoken of *wind-galls* and their treatment. A similar enlargement is found above the hock, between the tendons of the flexor of the foot, and the extensor of the hock. As from its situation it must necessarily project on both sides of the hock, in the form of a round swelling, it is called a *thorough-pin*. It is an indication of considerable work, but except it be of very great size, it is rarely attended by lameness. The mode of treatment must resemble that recommended for wind-galls. Although thorough-pin cannot be pronounced to be unsoundness, yet it behoves the buyer to examine well a horse with thorough-pin, and to ascertain whether undue work may not have injured him in other respects.

THE HOCK.

We now arrive at a very important joint, often the evident, and much oftener the unsuspected seat of lameness, and the proper formation of which is essentially connected with the excellence and value of the horse.

The inferior head of the tibia is formed into two deep grooves, with three sharpened ridges, one separating the grooves, and the other two forming the sides of them. It rests upon a very singular bone, called the astragalus (shaped like the die or dice used by the ancients), which has two circular risings or projections, and with a depression between them, answering exactly to the irregularities of the tibia, and these are received and morticed into each other. At the posterior part its convex surface is received into a concavity near the base of another bone, and with which it is united by very strong ligaments. This bone is called the *os calcis*, or bone of the heel, and it projects upwards, flattened at its sides, and receives, strongly implanted into it, the tendons of powerful muscles. These bones rest on two others, the *os cuboides* (cube-forme) behind, and the larger *cuneiform* or wedge-shaped bone, in front. The larger wedge-shaped bone is supported by two smaller ones, and these two smaller ones and the cube-bone by the upper heads of the shank-bone, and the splint-bones. The cube-bone is placed on the external splint-bone, and the cannon-bone; the small wedge-bone principally on the inner splint-bone; and the middle wedge-bone rests on the shank-bone only. These bones are all connected together by very strong ligaments, which prevent

dislocation, but allow a slight degree of motion among them, and the surfaces which are opposed to each other are thickly covered with elastic cartilage.

Considering the situation and action of this joint, the weight and stress thrown upon it must be exceedingly great, and it must be liable to much injury in rapid and powerful motion.

When we consider the work which it has to perform, and the thoughtlessness and cruelty with which that work is often exacted, we shall not wonder if this necessarily complicated mechanism is sometimes deranged. The hock is, from its complicated structure and its work, the principal seat of lameness behind. Nine-tenths of the lamenesses that occur in the hind-leg are to be traced to this joint, and when, after a careful examination, we are unable to find any other seat of lameness, we shall usually be justified in affirming that the hock is affected. (For its form see letter S, in skeleton on page 12.)

ENLARGEMENT OF THE HOCK.

First, there is inflammation, or sprain of the hock-joint generally, arising principally from sudden violent concussion; from check at speed; or from over-weight, and attended with enlargement of the whole joint, and great tenderness or lameness. This, however, like other diffused inflammations, is not so untractable as intense inflammations of a more circumscribed nature; and by rest and fomentation, or perchance firing, the limb recovers its action, and the horse becomes fit for ordinary work. The swelling, however, does not always subside. Enlargement, spread over the whole of the hock-joint, remains. A horse with an enlarged hock must always be regarded with suspicion, and is in truth unsound. The parts, altered in structure, are to a certain degree weakened. The horse may discharge his usual work through life, without return of lameness, but if one of those emergencies should occur when all his energies require to be exerted, the disorganised and weakened part will fail. The purchase, therefore, of a horse with enlarged hock will depend on circumstances. If he has other excellencies, he will not be uniformly rejected; for he may be ridden or driven moderately for many a year without inconvenience, yet one extra hard day's work may lame him forever.

CURB.

There are oftener injuries of particular parts of the hock-joint. We have had occasion frequently to describe the ring-like ligaments, which, in the neighborhood of joints, so usefully tie down the tendons. From sudden or over exertion these ligaments may be extended, and inflammation, swelling, and lameness may ensue; or the sheaths of the tendons in the neighborhood of joints, from their extent of motion in these situations, may be susceptible of injury. CURB is an affection of this kind. It is an enlargement at the back of the hock, about three or four inches below the point of the hock. It is either a strain in the ring-like ligament which binds the tendons down in their place,

or in the sheath of the tendons; oftener, we are inclined to think, of the ligament than of the sheath. Any sudden action of the limb of more than usual violence may produce it, and therefore horses are found to 'throw out curbs' after a hardly contested race, an extraordinary leap, a severe gallop over heavy ground, or a sudden check in the gallop. Young horses are particularly liable to it, and horses that are *cow-hocked*, or whose hocks and legs resemble those of the cow, the hocks being turned inward, and the legs forming a considerable angle outwards. This is intelligible enough; for in hocks so formed, the annular ligament must be continually on the stretch to confine the tendon.

Curbs are generally accompanied by considerable lameness at their first appearance, but the swelling is not always great; indeed, it sometimes presents so gradual a curve, that it is scarcely perceivable when we stand behind the horse, and both the horseman and the veterinary surgeon have overlooked it. It is best detected by observing the leg sideways.

The first object in attempting the cure is to abate inflammation, and this will be most readily accomplished by cold evaporating lotions, frequently applied to the part. Equal portions of spirit of wine, water, and vinegar, will afford an excellent application. It will be almost impossible to keep a bandage on. If the heat and lameness are considerable, it will be prudent to physic the horse, and to bleed from the subcutaneous vein. Whether the injury be of the annular ligament, or the sheath of the tendon, more active means will be necessary to perfect the cure. Either a liquid blister should be rubbed on the part, consisting of a vinous or turpentine tincture of cantharides, and this daily applied until some considerable swelling takes place, which should be allowed to subside, and then the liniment again resorted to; or, what is the preferable plan, the hair should be cut off, and the part blistered as soon as the heat has been subdued. The blister should be repeated until the horse goes sound, and the swelling has disappeared. In severe cases it may be necessary to fire, but we cannot recommend the indiscriminate recourse to the hot iron in every case of curb, and we would uniformly give a fair trial to milder measures. If the iron be used, the strokes should be in straight lines.

There are few complaints in which absolute and long-continued rest is more requisite than in curb. An injury so serious leaves the parts very materially weakened, and, if the horse be soon put to work again, the lameness will frequently return. No horse that has had curbs should be put even to ordinary work, in less than a month after the apparent cure, and even then he should very gradually resume his former habits.

A horse with a curb is manifestly unsound. A horse with the vestige of curb we should regard with much suspicion, or generally condemn as unsound; for although the neighbouring parts may have accommodated themselves to the slight enlargement that remains,

they are not in their natural situation, and have lost a portion of their natural strength: some latent disposition to relapse may continue, which extraordinary exertion may rouse to action; and, besides this, it should be remembered, that curb is an hereditary complaint, and that there may be some constitutional weakness of these parts.

BOG-SPAVIN.

The hock is plentifully furnished with mucous bags, to lubricate the different portions of this complicated joint. Some of these are found on the inside of the joint. From over-exertion of the joint they become inflamed, and considerably enlarged. They are wind-galls of the hock. The subcutaneous vein passes over the inside of the hock, and over some of these enlarged bags, and is compressed between the skin and the enlarged bag; and, consequently, the passage of the blood through it is partially stopped. The blood, however, continues to be returned from the leg and foot, and being thus arrested in its course, a portion of the vein below the impediment, and between it and the next valve, is distended, and causes the soft tumour on the inside of the hock, called the *bog* or *blood spavin*. This is a very serious disease, attended with no great, but often permanent lameness, and a disease too apt to return, when the enlargement has subsided under medical treatment. It must be considered as decided unsoundness. In a horse for slow draught, it is scarcely worth while even to attack it. In a horse destined to more rapid action, the probability of a relapse should not be forgotten, when the chances of success, and the expenses of treatment are calculated.

The disease (the enlarged mucous capsule), lies deep, and is with difficulty operated upon. Uniform pressure will sometimes cause the absorption of the fluid contained in cysts or bags like these, but in a joint of such extensive motion as the hock, it is difficult, or almost impossible, to confine the pressure on the precise spot where it is required; and could it be made to bear on the enlarged bag, it would likewise press on the vein, and to a greater degree hinder the passage of the blood, and increase the dilation below the obstruction. The old and absurd method of passing a ligature above and below the enlarged portion of the vein, and then dissecting out the tumour, is not, in the advanced stage of veterinary science, practised by any surgeon who has a regard to his reputation. The only method of relief which holds out any promise even of temporary success, is by exciting a great deal of inflammation on the skin, and thus rousing the deeper seated absorbents to carry away the fluid effused in the enlarged bag. Repeated blisters then will afford the fairest prospect of removing the tumour, or firing may be tried; but in the majority of cases, the disease will bid defiance to all our means, or will return, and baffle our hopes when we had seemed to have been accomplishing our object. A horse with bog-spavin will do very well for ordinary work. He may draw in a cart, or trot fairly in a lighter

carriage, with little detriment to his utility, but he will never do for rapid or hard work, and it is in vain to attempt to make him.

BONE-SPAVIN.

A still more formidable disease ranks under the name of spavin, and is an affection of the bones of the hock-joint.

It is not unusual to see whole teams of horses, and that all the year round, with the outer heel of the hind foot considerably raised above the other. This unequal bearing, or distribution of the weight, cannot fail of being injurious; it will place an unequal strain on the ligaments of the joints, and particularly of the hock-joint, and increase the tendency to spavin.

The weight and concussion which are thus thrown on the inner splint-bone produce, in the first place, inflammation of the cartilaginous substance which unites it to the shank-bone. The consequence of this is, that the cartilage is absorbed, and bone deposited;—the union between the splint-bone and the shank becomes bony instead of cartilaginous;—the degree of elastic action between them is destroyed, and there is formed a splint of the hind-leg. This is uniformly on the inside of the hind-leg, because the greater weight and concussion are thrown on the inner splint-bones. As in the fore-leg, the disposition to form bony matter having commenced, and the cause which produced it continuing to act, bone continues to be deposited, and it appears generally in the form of a tumour, where the head of the splint-bone is united with the shank, and in front of that union. This is called BONE-SPAVIN. Inflammation of the ligaments of any of the small bones of the hock, proceeding to bony tumour, would equally class under the name of spavin, but, with very few exceptions, the disease commences on the precise spot we have described.

When spavin is forming there is always lameness, and that frequently to a very great degree; but when the membrane of the bone has accommodated itself to the tumour that extended it, the lameness subsides, or disappears, or depends upon the degree in which the bony deposit interferes with the motion of the joint. We often see horses with exceedingly large spavins, that are only slightly lame, or that merely have a stiffness in their gait at first starting, and that gradually goes off after a little motion; and we meet with others with the bony tumour comparatively small, yet the lameness so great as to destroy the usefulness of the horse. There is always this peculiarity in the lameness of spavin, that it abates, and sometimes disappears, on exercise; and therefore, a horse, with regard to which there is any suspicion of spavin, should be examined, when he is first taken from the stable.

If the spavin continues to increase, the bony deposit first spreads over the lower wedge bones, for these are nearest to its original seat. They are capable of slight motion, and share in every action of the joint, but their principal design was to obviate concussion. The chief motion of the joint, and that compared with which the motion

of the others is scarcely to be regarded, is confined to the tibia, and the astragalus, and therefore, stiffness rather than lameness may accompany spavin, even when it is beginning to affect the small bones of the joint. Hence, too, we see the advantage of these bones having each its separate ligaments and membranes, and constituting so many joints, since injury may happen to some of them, without the effect being propagated to the rest. When the bony deposit continues to enlarge, and takes in the second layer of bones, the larger wedge-bones, and even spreads to the cube-bones on the other side, even then the lameness may not be excessive, because these two are joints, or parts of the joint, in which the motion is small; but when it extends to the union of the tibia, and the astragalus; when the joint, in which is the chief motion of the hock, is attacked, the lameness is indeed formidable, and the horse becomes nearly or quite useless.

Spavined horses are generally capable of slow work. They are equal to the greater part of the work of the farm, and therefore they will not be always rejected by the small farmer, and may generally be procured at little price. These horses are not only capable of agricultural work, but they generally improve under it; they become less lame, and even the bony tumour to a certain degree diminishes. There is sufficient moderate motion and friction of the limb to rouse the absorbents to action, and cause them to take up a portion of the bony matter thrown out, but not enough to renew or prolong inflammation. We cannot say that the plough affords a *cure* for spavin, but we have seen many instances in which the spavined horse has very materially improved at it.

For fast work, and for work that must be regularly performed, they are not so well calculated; for this lameness behind produces great difficulty in rising up, and the consciousness that he will not be able to rise without painful effort, prevents the horse from lying down at all; and a horse that cannot rest well, cannot long travel far and fast.

The treatment of spavin is simple enough, but not always effectual.

Remedy. The owner of the horse will neither consult his own interest, nor the dictates of humanity, if he suffers the chisel and mallet, or the gimlet, or the pointed iron, or arsenic to be used; yet measures of considerable severity must be resorted to. Repeated blisters will usually cause either the absorption of the bony deposit, or the abatement or removal of the inflammation of the ligaments. As a last resort, however, the hot iron may be applied.

We have thus presented our readers with a fearful list of diseases belonging to the hock, but our catalogue is not completed. It is well known that the horse is frequently subject to lameness behind, when no ostensible cause for it can be found, and there is no external heat or enlargement to indicate its seat. Farriers and grooms pronounce these to be affections of the stifle, or round-bone; or if the gait of the horse and peculiar stiffness of motion point out the hock as the affected part, yet the joint may be of its natural size, and neither heat nor tenderness can be discovered. The groom has here a method of

unravelling the mystery: he says that it is the beginning of spavin; but months and years pass away, and the spavin does not appear, and the horse is at length destroyed as incurably lame.

Two layers of small bones are on the inside of the hock; the larger wedge-like bone above; and the middle, and the smaller one below, and it will be seen that almost the whole of the weight of the horse, communicated by the tibia, is thrown upon these bones. The cube-bone does little more than support the point of the hock. It is then easy to suppose; that in the concussion of hard work or rapid travelling, these bones, or the delicate and sensible membranes in which they are wrapped, may be severely injured. Repeated dissections of horses that have been incurably lame behind, without any thing external to point out the place or cause of lameness, have shewn that inflammation of the membranes lining these joints, and secreting the fluid that lubricates them, has taken place; and has been accompanied by all the pain of joint disease, and evils corresponding to those which we have described, when treating of broken knees, and the consequent inflammation of the membrane and internal part of the joint. Indeed, so clearly is this now established, that when, after careful and repeated examination by a competent person, no seat or cause of lameness can be discovered, we shall be right nineteen times out of twenty, in deciding that it is disease in this portion of the hock. No enlargement, no heat, will indicate its existence, but when it has been long established, and ossified matter has been thrown out between these bones, it will, like the true spavin, spread, and appear either on the inside of the hock, or surrounding the whole of the joint.

In these cases, then, of mysterious lameness, and when, after the removal of the shoe, and the most patient search, we have failed in discovering a cause of lameness elsewhere, we shall be justified in considering this as the affected part, and treating it accordingly: and as the injury is deep, and in the very centre of the joint, we must adopt severe measures in order to reach it. We must blister immediately, and repeat the blister, and enjoin perfect quietude and rest; but here, as in the bone-spavin, and oftener than in that disease, all our appliances and means may be fruitless. Our only hope lies in an early attempt to combat the evil; and in all these obscure cases, he is unjust to himself who does not speedily have recourse to their advice, to whom science and practice have given a facility in detecting latent disease.

THE POINT OF THE HOCK.

If the reader has not forgotten what we have said concerning the projection of the elbow, he will be convinced that the form of the hock is materially connected with the value of the horse. The most powerful of the flexor or bending muscles are inserted into the point of the hock, or the extremity of the os calcis; and in proportion to the projection of the hock, or, in other words, the length of this bone, will two purposes be effected. The line of direction will be more advanta-

geous, for it will be nearer to a perpendicular; and the arm of the lever to which the power is applied will be lengthened, and mechanical advantage will be gained to an almost incredible extent. Suppose this bone of the hock to be three inches in length; the joint formed by the tibia and the astragalus is evidently the centre of motion; and the weight, concentrated about the middle of the shank, is the obstacle to be overcome. If the weight be four times as far from the centre of motion as the power, a force equal to four times the weight would raise it. It is, however, here to be remembered, that it is not merely the weight of the leg which is to be raised, but the weight of the horse, for the time resting upon the leg, and that weight to be propelled or driven forward. At what shall we calculate this? We may fairly suppose that the muscles whose tendons are inserted into the point of the hock exert an energy equal to 4000lbs. Let us further suppose, that an inch is added to the point of the hock, which will be an addition of one-third to its length; a muscular power of less than 3000lbs. will now effect the same purpose. The slightest lengthening, therefore, of the point of the hock will make an exceedingly great difference in the muscular energy by which the joint is moved; and a difference that will wonderfully tell in a long day's work. On this account, the depth of the hock, or the length of the bone of which we are speaking, is a point of the greatest importance.

There is, however, a limit to this. In proportion to the length of this bone must be the space which it passes over in order sufficiently to bend the limb; and in that proportion must be the contraction of the muscle; and consequently the length of the muscle, that it may be enabled thus to contract; and, therefore, if this bone were inordinately lengthened, there would require a depth of quarter which would amount to deformity. A hock of this disadvantageous length is, however, rarely or never met with, and it is received among the golden rules in judging of the horse, that this bone of the hock cannot be too long.

CAPPED HOCK.

The point of the hock is sometimes swelled. A soft fluctuating tumour appears on it. This is an enlargement of one of those mucous bags of which we have spoken, and which surrounds the insertion of the tendons into the point of the hock. It is seldom accompanied by lameness, but yet it is a serious business. It is usually produced by blows, and, in the majority of instances, by the injury which the horse inflicts upon himself by kicking: therefore a horse with a capped hock is properly regarded with a very suspicious eye. The whole of the hock should be most carefully examined, in order to discover whether there are other marks of violence, and the previous history of the animal should, if possible, be obtained. Generally the kicking is in harness, but some horses have the habit of kicking in the stall: it is possible, however, that lying on a thin bed, or on no bed, may bruise the hock and produce the swelling, or it may even result from sprain

of the hock; but we repeat that it is far oftener the consequence of external violence.

Here again it is exceedingly difficult to apply a bandage; and puncturing the tumour, or passing a set on through it, would be a most injudicious and dangerous practice. Blisters, repeated as long as may be necessary, are the proper means to be employed. Sometimes the tumour will disappear of itself, but at others it will attain a very large size, or will assume a callous structure that will bid defiance to all the means we can employ.

MALLENDERS AND SALLENDERS.

In the inside of the hock, or a little below it, as well as at the bend of the knee, there is sometimes a scurfy eruption called **MALLENDERS** in the fore leg, and **SALLENDERS** in the hind leg. They seldom produce lameness, but if no means are taken to get rid of them, a discharge proceeds from them which it is afterwards difficult to stop; and certainly they have an unsightly appearance, and generally argue bad stable management. A diuretic ball should be occasionally given, and an ointment, composed of one part of sugar of lead, two of tar, and six of lard, rubbed over the part. Should this fail, the weak mercurial ointment should be used.

COW-HOCKS.

The line of direction of the legs beneath the hocks should not be disregarded. The leg should descend perpendicularly to the fetlock. The weight and stress will thus be equally diffused, not only over the whole of the hock, but also the pasterns and the foot. Some horses, however, have their hocks closer than natural to each other, and the legs take a divergent direction outward, and the toes likewise are turned outward. These horses are said to be cat or cow-hocked. They are generally supposed to possess considerable speed, and we believe that they do; and we thus account for it. The cow-hocked horse has his legs not only turned more outward, but bent more under him, and this increases the distance between the point of the hock and the tendons of the perforating muscle. It increases the space which is usually occupied by thorough-pin. Then the point of the hock, moved by the action of the muscles, is enabled to describe a greater portion of a circle; and in proportion to the increased space passed over by the point of the hock, will the space passed over by the limb beneath be increased, and so the stride of the horse may be lengthened, and thus far his speed may be increased. But this advantage is more than counterbalanced by many evils. This increased contraction of the muscles is an expenditure of animal power, and, as we have already stated, the weight and the concussion being so unequally distributed by this formation of the limbs, some part must be overstrained and overworked, and injury must ensue. On this account it is, that the cow-hocked horse is more subject than others to thorough-pin and spavin; and is so disposed to curbs, that these hocks are

denominated by horsemen *curby* hocks. The mischief extends even farther than this. Such a horse is peculiarly liable to wind-gall, sprain of the fetlock, cutting, and knuckling.

A slight inclination to this form in a strong powerful horse may not be very objectionable, but a horse decidedly cow-hocked should never be selected.

SPRING-HALT.

Before we quit the hock, we must notice a peculiar involuntary twitching of the hind leg, or convulsive action of the muscles by which it is bent, and which is termed **SPRING-HALT**. This is evidently an affection of some of the nerves which communicate motion to these muscles. It is an irregular action of nervous energy; but what particular fibril is affected, or what muscle is chiefly spasmed, has never been ascertained. It is principally observed when the horse first comes from the stable, and gradually ceases after he has been exercised a while. It is unpleasant to the rider, but it cannot be denominated unsoundness; on the contrary, common opinion has given to the horse with spring-halt a more than usual share of strength and endurance; and if it be an excess of nervous energy, although irregularly exerted, we shall find no difficulty in associating it with general powerful muscular action. However this may be, the precise nature of the defect has never been determined, nor has any cure for it been discovered.

THE HIND LEG.

The construction of the hind leg, and the injuries to which it is subject, are so similar to those of the fore leg, that we shall content ourselves with referring to our description of them given in the last chapter, only observing that the shank-bone is longer than that of the fore leg; the outer splint-bone is considerably larger than the inner one, and the pasterns are longer than those of the fore leg, and less oblique.

On the back part of the leg are sometimes excrescences, called by farriers **RAT-TAILS**, from the appearance they give the hair. They will generally yield to the mild mercurial ointment, but in very bad cases it may be necessary to remove them with a knife.

Before we quit the legs, we must notice two frequent and very troublesome diseases. The first is

SWELLED LEGS.

The fore legs are sometimes subject to considerable enlargement, but much oftener the hind ones. Occasionally when the horse does not seem to labour under any other disease, and sometimes from an apparent shifting of inflammation from other parts, (inflammation of the lungs or the eye not unfrequently thus changes its seat,) the hind legs suddenly swell to an enormous degree from the hock, and almost from the stifle to the fetlock, attended by heat, and extreme tenderness of the skin, and excessive and very peculiar lameness. The pulse likewise becomes quick and hard, and the horse evidently labours under

considerable fever. It is acute inflammation of the cellular substance of the legs, and that most sudden in its attack, most violent in its degree, and therefore attended by the pouring out of a great deal of fluid, in this cellular substance. It occurs in young horses, and in those which are over-fed and little exercised, without previous inflammation in any other part. Fomentation, diuretics, or physic, or, if there be much fever, a moderate bleeding, will often relieve the distension almost as suddenly as it appeared.

The kind of swelled legs, most frequent of occurrence, and most troublesome, is of a different nature, or rather it is so various in its kind and causes, and consequences and mode of treatment, that it deserves attentive consideration. One principle, however, will guide us to a right opinion and treatment of it,—that it is produced either by *actual or comparative debility or loss of power in the part attacked*. Horses seemingly in perfect health, and with a full allowance of food, if suffered to remain several days without exercise, will have swelled legs. The arterial capillary vessels have conveyed a great deal of fluid to the extremities;—from over-feeding, and want of muscular exertion and the perspiration connected with it, the fluids have accumulated, and are lodging in the extremities, because the vessels have not power to return them. The heart is acting upon an additional quantity of fluid, while, by the want of exercise, the limbs are deprived of the principal power by which the fluids are returned; for the blood is materially assisted in its return through the veins by the action of the muscles, and the absorbents are roused to action by the exercise and motion of the different parts. The cure, therefore, is sufficiently plain: by physic or diuretics, the quantity of the fluid is lessened, and by exertion increasing the perspiration it is likewise diminished, and, what is more important, both the veins and the absorbents are assisted in their action.

Horses taken from grass and brought into close stables very speedily have swelled legs, because the difference of food, and increase of nutriment, rapidly increase the quantity of the circulating fluid; while the want of exercise takes away the means by which it might be got rid of. The remedy here needs not to be stated. Swelled legs, however, may proceed from general debility; they may be the consequence of starvation, or disease that has considerably weakened the animal; and these parts, being farthest from the centre of circulation, are the first to shew the loss of power by the accumulation of fluid in them. Here the means of cure would lie to increase the general strength, with which the extremities would sympathise, and mild diuretics and tonics are evidently indicated.

Horses in the spring and fall are subject to swelled legs. The powers of the constitution are principally employed in providing a new coat for the animal, and the extremities have not their share of vital influence. Mingled cordials and diuretics are indicated here—the diuretic to lessen the quantity of the circulating fluid,—the cordial to invigorate the frame

Swelled legs are most teasing in horses that are in tolerable or good health, but whose work is somewhat irregular. The cure is to give more equable exercise;—to walk the horse out daily when the usual work is not required, and by some mechanical means to supply to the extremities the want of the motion of the parts, and the consequent urging on of the return of the fluid. Friction by hand-rubbing is an excellent means of fining the legs, at least for a time. Bandages have a greater and more durable effect, for nothing tends more to support the capillary veins, and rouse the action of the absorbents, than moderate pressure. Hay-bands will form a very good bandage for the agricultural horse, and their effect will probably be increased by previously dipping them in water. As to medicines we have little to say: the fewer of them that are given in these cases the better. The diuretic, or urine-ball, the constant resource of the idle groom or carter, is particularly objectionable. Its frequent and undue stimulus of the urinary organs will be followed by speedy and often incurable debility. If the swelling bids defiance to exercise and friction and bandage, the aid of the diuretic may be resorted to, but never until these have failed, unless there be an evident tendency to grease or humour.

GREASE.

Swelled legs, although distinct from GREASE, are apt to degenerate into it. This disease, therefore, comes next under our consideration. It is an inflammation of the skin of the heel, sometimes of the fore, but oftener of the hind foot. It is not a contagious disease, although when it once appears in a stable it frequently goes through it, for it is usually to be traced to bad stable management. The skin of the heel of the horse somewhat differs from that of any other part. There is a great deal of motion in the fetlock, and to prevent the skin from excoriation or chapping, it is necessary that it should be kept soft and pliable; therefore, in the healthy state of the part, the skin of the heel has a peculiar greasy feel. Under inflammation, the secretion of this greasy matter is stopped—the heels become red, dry, and scurfy; and being almost constantly in motion, cracks soon succeed: these sometimes extend, and the whole surface of the heel becomes a mass of soreness, ulceration and fungus.

The heel is subject to this virulent inflammation, on account of its situation, far removed from the centre of the circulation. It is likewise exposed to more variations of temperature than any other part of the frame. As the horse stands in the closed stable, the heat of the part is increased by being deeply imbedded in straw. When the stable door is open, the heels are nearest to the door, and most powerfully receive the current of cold air; and when the horse is taken from the stable to his work, the heels are covered with mire and wet, and chilled by the slow and long process of evaporation, which is taking place from them. We cannot wonder then at the frequency with which the heels are attacked with inflammation, nor the difficulty

there is in subduing that inflammation. In the winter season, chaps and cracks will occasionally appear in the best conducted stables; but where the comfort of the animal is neglected, and every kind of filth is suffered to accumulate, the disease will be more frequent and more virulent.

The farmer's horse is not so subject to grease as many others, because he is not usually exposed so much to sudden and extreme changes of temperature, and the heels particularly are not thus exposed. In many instances he lives almost entirely out of doors, or, if he is stabled, the stables of the little farmer are not always air-tight. The wind finds its way through many a cranny, instead of entering at the door alone, and blowing upon the heels.

A great deal of error has prevailed, and it has led to much bad practice, in connecting grease with the notion of humours flying about the horse, which must have vent somewhere, and which attack the heels as the weaker parts of the frame. Thence arise the physicking, and the long course of diuretics, which *truly* weaken the animal, and often do irreparable mischief. Grease is a local complaint;—it is produced principally by causes which act locally; and it is most successfully treated by local applications. Physick and diuretics may be useful in abating inflammation; but the grand object is to abate the inflammatory action which exists in the skin of the heel, and to heal the wounds, and remedy the mischief which it has occasioned.

The first appearance of grease is usually a dry and scurfy state of the skin of the heel, with redness, heat, and itchiness. The heel should be well washed with soap and water; as much of the scurf should be detached as is easily removable. A white ointment composed of one drachm of sugar of lead, rubbed down with an ounce of lard, will usually supple and cool, and heal the part.

When cracks appear, the mode of treatment will depend on their extent and depth. If they are but slight, a lotion composed of a solution of two drachms of blue vitriol, or four of alum, in a pint of water, will often speedily dry them up and close them. But if the cracks are deep, with an ichorous discharge, and the lameness considerable, it will be necessary to poultice the heel. A poultice of linseed meal will be the most effectual, unless the discharge is thin and offensive, when an ounce of finely powdered charcoal should be mixed with the linseed meal, or a poultice may be made of carrots boiled soft, and mashed. The efficacy of a carrot poultice is seldom sufficiently appreciated in cases like these.

When the inflammation and pain have evidently subsided, and the cracks discharge good matter, they may be dressed with an ointment composed of one part of resin, and three of lard melted together, and one part of calamine powder added, when these begin to get cool. The healing will be quickened if the cracks are occasionally washed with either the vitriol or alum solution. A mild diuretic may here be given every third day, but a mild dose of physic will form the best medicine that can be administered.

After the chaps or cracks have healed, the legs will sometimes continue gorged and swelled. A flannel bandage evenly applied over the whole of the swelled part will be very serviceable; or, should the season admit of it, a run at grass, particularly spring grass, should be allowed. A blister is inadmissible, from the danger of bringing back the inflammation of the skin, and discharge from it; but the actual cautery, taking especial care not to penetrate the skin, must occasionally be resorted to.

In some cases the cracks are not confined to the centre of the heels, but spread over them, and extend on the fetlock, and even up the leg, while the legs are exceedingly swelled, and there is a watery discharge from the cracks, and apparently oozing through the skin at other places. The parts are exceedingly tender, and sometimes hot, and there is an appearance which the farrier thinks very decisive as to the state of the disease, and which the better informed man should not overlook,—*the heels smoke*;—the skin is so hot, that the watery fluid partly evaporates as it runs from the cracks, or oozes through the skin.

There will be great danger in suddenly stopping this discharge. Inflammation of a more important part has rapidly succeeded to the injudicious attempt. The local application should be directed to the abatement of the inflammation. The poultices just referred to should be diligently used night and day, and especially the carrot poultice; and, when the heat and tenderness and stiffness of motion have diminished, astringent lotions may be applied; either the alum lotion, or a strong decoction of oak bark, changed, or used alternately, but not mixed. The cracks should likewise be dressed with the ointment above mentioned; and the moment the horse can bear it, a flannel bandage should be put on, reaching from the coronet, to three or four inches above the swelling.

The medicine should be confined to mild diuretics, mixed with one third part of cordial mass, or, if the horse be gross, and the inflammation run high, a dose of physic may be given. From the account we have given, it will easily be distinguished in what cases physic is indicated, and in what states of the constitution or disease we may be content with diuretics. If the horse be strong, and full of flesh and fat, physic should always precede, and sometimes supersede the diuretics; in cases of much debility, diuretics with aromatics or tonics will be preferable.

The feeding will likewise vary with the case, but with these rules which admit of no exception, that green meat should be given, and more especially carrots, when they are not too expensive, and mashes, if the horse will eat them, and never the full allowance of corn.

Walking exercise should be resorted to as soon as the horse is able to bear it, and this by degrees may be increased to a gentle trot.

From bad stable management at first, and neglect during the disease, a worse kind of grease is occasionally found. The ulceration

extends over the skin of the heel and the fetlock, and a fungus springs from the surface of both, highly sensible, bleeding at the slightest touch, and interspersed with scabs. By degrees, portions of the fungus begin to be covered with a horny substance, protruding in the form of knobs, and collected together in bunches. These are known by the name of *grapes*. A stinking and very peculiar discharge proceeds from nearly the whole of the unnatural substance. The horse evidently suffers much and is gradually worn down by the disease. The assistance of a veterinary surgeon is here indispensable.

Some horses are more subject to grease than others, particularly draught horses, both heavy and light, but particularly the former, and if they have no degree of blood in them. It was the experience of this which partly contributed to the gradual change of coach and other draught horses to those of a lighter breed. It may, however, be affirmed, without danger of error, that in the great majority of cases, grease arises from mismanagement and neglect; and the farmer and the horse-proprietor would not be unjust to their servants, and would materially promote their own interest, if they exacted a fine for every case of grease that occurred in their stable.

Every thing that has a tendency to excite inflammation in the skin of the heel is a cause of grease. Therefore, want of exercise, for the reasons which we have stated when treating of swelled legs, is a frequent cause; the fluid which accumulates about the extremities, and is unable to return, is a source of irritation by its continued pressure. When high feeding is added to irregular or deficient exercise, this disease is evidently still more likely to be produced. Want of cleanliness in the stable is a fruitful source of this complaint. When the heels are embedded in filth they are weakened by the constant moisture surrounding them, and irritated by the acrimony of the dung and the urine, and little prepared to endure the evaporation and cold to which they are exposed when the horse is taken out of the stable. We believe, however, that the absurd practice of washing the feet and legs of horses when they come from their work, and either carelessly sponging them down afterwards, or leaving them to dry as they may, is by far the most common origin of grease.

When the horse is warmed by his work, and the heels share in the warmth, the momentary cold of washing may not be injurious if the animal be immediately rubbed dry; yet even this would be better avoided; but to wash out the heels, and then leave them partially dry, or perfectly wet, and suffering from the extreme cold which is produced by evaporation from a wetted surface, is the most absurd, dangerous, and injurious practice that can be imagined. It is worse when the stage-horse or the plough-horse is plunged up to his belly in the river or pond, immediately after his work. The owner is little aware how many cases of inflammation of the lungs, and bowels, and feet, and heels, follow. It would, therefore, be an excellent rule never to wash the heels of these horses. After they have been suffered to stand for twenty minutes in the stable, during which time the horse-

keeper or the carter may be employed in taking care of the harness, or carriage, or beginning to dress the horse, the greater part of the dirt which had collected about the heels may be got rid of with a dry brush; and the rest will disappear a quarter of an hour afterwards under the operation of a second brushing. The trouble will not be greater, and the heels will not be chilled and subject to inflammation.

There has been some dispute as to the propriety of cutting the hair from the heels of farm-horses. Custom has very properly retained the hair on them. Nature would not have given it had it not been useful. It guards the heel from being injured by the inequalities of the ploughed field; it prevents the dirt in which the heels are constantly enveloped, from reaching and caking on and irritating the skin; it hinders the usual moisture which is mixed with the clay and mould from reaching the skin, and it preserves an equal temperature in the parts. If, however, the hair be suffered to remain on the heels of our farm-horses, there is greater necessity for brushing and hand-rubbing the heels, and never washing them; for the water used in washing will readily penetrate through the hair, and it will be absolutely impossible to get rid of it again. Indeed, we would neglect the heels altogether, or let, as many careless carters do, the dirt accumulate from month to month, rather than wash them. This would, indeed, be idle and injurious treatment, but it would be by far the lesser evil.

Fashion and utility have removed the hair from the heels of our hackneys and carriage-horses. The hand-rubbing or dry brushing will be an easy process; or if the heels must be washed, let them be carefully and thoroughly dried. We close this part of our treatise by repeating that grease is the child of negligence and mismanagement. It will be the fault of the gentleman and the farmer if it be not speedily banished from every stable.

CHAPTER VIII.

THE FOOT.

THE foot is composed of the horny box which covers the extremities of the horse, and the contents of that box. We will first consider the hoof, or box, which is composed of the crust or wall, the bars, the sole, and the horny frog.

THE CRUST OR WALL OF THE HOOF.

The crust, or wall, is that portion which is seen when the foot is placed on the ground, and reaches from the termination of the hair to the ground. It is deepest in front, where it is called the toe; shallower at the sides, which are denominated the quarters; and of least extent behind, where it is termed the heel. It is placed flat on the ground, but ascends obliquely backward, and possesses different degrees of obliquity in different feet. In a sound hoof, the proper degree of slanting

is calculated at forty-five degrees, or the fourth part of a semicircle.

Form.

When it is more oblique, or the crust is said to have "fallen in," it indicates undue flatness of the sole, or, if the obliquity be very much increased, pumiced, or convex sole. If it be more upright than the angle we have mentioned, it shews a contracted foot, and a sole too concave; so that there is no necessity to take up the foot in order to ascertain either of these states of it. It is also of importance to observe whether the depth of the crust appears rapidly or slowly to decrease from the front to the heel. If the decrease be little, and even at the heel the crust is high and deep, it indicates a foot liable to contraction, and sand-crack, and thrush and inflammation, and the pastern is upright, and the paces of the horse are not pleasant. If the crust diminish rapidly in depth, and the heels are low, this is accompanied by too great slanting of the pastern, and disposition to sprain of the back sinew; the foot itself is liable to be weak and flat and bruised, and there is likewise more tendency to that frequent but obscure lameness of which we shall have occasion to treat, termed the "navicular-joint disease." The foot has spread out too much at the side, instead of growing upward, and therefore it is too much exposed.

The crust in front is rather more than half an inch in thickness, and becomes gradually thinner towards the quarters and heels. If, therefore, there be but half an inch for nail-hold at the toe, and not so much at the quarters, we need not wonder if horses are occasionally wounded in shoeing, and especially when some of them are so unmanageable while undergoing that process.

While the crust gets thinner towards both quarters, it is thinner at the inner quarter than it is at the outer, because more weight is thrown upon it than the outer. It is more under the horse; it is under the inner splint-bone, on which so much more of the weight rests than on the outer, and, being thinner, it is able to expand more; its elasticity is called more into play, and concussion and injury are avoided. When the expansion of the quarters is prevented by their being nailed to an unbending shoe, the inner quarter suffers most. Corns are oftenest found there; contraction begins there; sand-crack is seated there. Nature meant that this should be the most yielding part, in order to obviate concussion, because on it the weight was principally thrown, and therefore when its power of yielding is taken away it must be the first to suffer.

A careful observer will likewise perceive that the inner quarter is a little higher than the outer. While it is thin to yield to the shock, its increased surface gives it sufficient strength.

On account of its thinness, and the additional weight which it bears, the inner heel wears away quicker than the outer; a circumstance that should never be forgotten by the smith. His object is to give a plain and level bearing to the whole of the crust. To accomplish this, it will be often scarcely necessary to remove any thing from the inner heel, for it is already removed by the wear of the foot. If he forgets this, as he too often seems to do, and takes off with his

knife or his buttress an equal portion all round, he leaves the inner and weaker quarter lower than the outer; he throws an uneven bearing upon it; and produces corns and sand-cracks and splints, which a little care and common sense might have avoided. The crust does not vary much in thickness, until near the top, at the *coronet*, or union of the horn of the foot with the skin of the pasterns where it rapidly gets thin. It is in a manner scooped and hollowed out. It likewise changes its colour and its consistence, and seems almost like a continuation of the skin, but easily separable from it by maceration, or disease. This thin part is called the *coronary ring*; and it receives within it, or covers, a thickened and bulbous prolongation of the skin, called the *coronary ligament*. This requires a better name, for it has not a portion of ligamentous structure in it. This prolongation of the skin is thickly supplied with blood-vessels. It is almost a mesh of blood-vessels connected together by fibrous texture, and many of these vessels are employed in secreting or forming the crust or wall of the foot. Nature has enabled the sensible laminae of the coffin-bone, which will be described presently, to secrete some horn, in order to afford an immediate defence for itself when the crust is wounded or taken away. Of this we have proof, when in sand-crack, or quittor, we are compelled to remove a portion of the crust. A pellicle of horn or of firm hard substance resembling it, soon covers the wound; but the crust is principally formed from this coronary ligament. Hence it is, that in sand crack, quittor, and other diseases in which strips of the crust are destroyed, it is so long in being renewed, or *growing down*. It must proceed from the coronary ligament, and so gradually creep down the foot with the natural growth or lengthening of the horn, of which, as in the human nail, a supply is slowly given to answer to the wear and tear of the part.

Below the coronary ligament is a thin strip of horny matter, which has been traced from the frog, and has been supposed by some to be connected with the support or action of the frog, but which is evidently intended to add to the security of the part on which it is found, and to bind together those various substances which are collected at the coronet. It resembles, more than any thing else, the strip of skin which surrounds the root of the human nail, and which is placed there to strengthen the union of the nail with the substance from which it proceeds.

The crust is composed of numerous fibres running at the toe in a straight direction from the coronet to the ground, but at the quarters, taking an oblique direction from the heel forwards. This construction is best calculated to enable the foot to expand when it comes in contact, with the ground, and by that expansion, permitting the gradual descent of the bones of the foot, and obviating much concussion. The crust is thinner at the quarters and towards the heels, because those are the parts at which the principal expansion must take place. These fibres are held together by a glutinous substance, but in such a manner as to permit a slight degree of separation, or to bestow the

power of expansion on the foot; and when recently separated from the foot, it is an exceedingly elastic substance, and very tough, that it may not chip and break with the violence to which it is often exposed.

In the absurd method of stable management, to which we shall have occasion again and again to refer, it sometimes loses much of this toughness, and becomes brittle and liable to chip and break. Inflammation of the internal part of the foot, by the increased heat which is produced, will cause brittleness of the hoof; deficiency of moisture and neglect of stopping will produce the same effect. Many horses are peculiarly liable to brittle hoofs during the summer; this is a very serious defect, and in some cases so much of the hoof is gradually broken away, that there is no hold left for the nails. A mixture of one part of oil of tar, and two of common fish oil, well rubbed into the crust and the hoof, will restore the natural pliancy and toughness of the horn, and very much contribute to the quickness of its growth.

The wall of the hoof should be smooth and level: protuberances or rings round the crust indicate that the horse has had fever in the feet; and that to such a degree as to produce an unequal growth of horn, and probably to leave some injurious consequences in the internal part of the foot. If there be a depression or hollow in the front of the foot, it betrays a sinking of the coffin-bone, and a flat or pumiced sole; if the hollow be at the quarters, it is the worst symptom of bad contraction.

The colour of the hoof is a matter of some consequence. There is a common, and we believe a well-founded prejudice against white feet, and especially whiteness of the near foot. White horn is said to be weaker than that of the usual dark colour; the sole is almost uniformly flat, and the quarters are weak.

The bars are a continuation of the crust, forming an acute angle, and meeting at a point at the toe of the frog: and the inside of the bars, like the inside of the crust, presents a continuance of the horny leaves which we have just described, shewing that it is a part of the same substance, and helping to discharge the same office.

THE FROG.

In the space between the bars, and accurately filling it, is the **FROG**. It is a triangular portion of horn, projecting from the sole, almost on a level with the crust, and covering and defending a soft and elastic substance called the *sensible frog*.

The frog being placed at, and filling the hinder part of the foot, discharges a part of the duty sustained by the crust; for it supports the weight of the animal. It assists, likewise, and that to a material degree, in the expansion of the foot. It is formed internally of two prominences on the sides, and a cleft in the centre, presenting two concavities with a sharp projection in the middle, and a gradually rounded one on each side. It is also composed of a substance peculiarly flexible and elastic. What can be so well adapted for the

expansion of the foot, when a portion of the weight of the body is thrown on it? How easily will these irregular surfaces yield, and spread out, and how readily return again to their natural state? In this view, therefore, the horny frog is a powerful agent in opening the foot; and the diminution of the substance of the frog, and its elevation above the ground, are both the cause and the consequence of contraction; the cause, as being able no longer powerfully to act in expanding the heels; and the consequence as obeying a law of nature, by which that which no longer discharges its natural function is gradually removed. It is, however, the cover and defence of the internal and sensible frog, at which we are not yet arrived, and therefore we are at present unable to develop its full use; but we have said enough to shew the absurdity of the common practice of unsparingly cutting it away.

The rough and detached parts should be cut off at each shoeing, and the substance of the frog itself, so as to bring it just above or within the level of the shoe. It will then, in the descent of the sole, when the weight of the horse is thrown upon it in the putting down of the foot, descend likewise, and pressing upon the ground, do its duty; while it will be defended from the wear, and bruise, and injury which it would receive if it came upon the ground with the first and full shock of the weight. This will be the proper guide to the smith in operating, and to the proprietor in the directions which he gives, and the latter should often look to this, for it is a point of very great moment. A few smiths carry the notion of *frog pressure* to an absurd extent, and leave the frog beyond the level of the sole,—a practice which is dangerous in the horse of slow draught, and destructive to the hackney; but the majority of them err in a contrary way, and, cutting off too much of the frog, lift it above the ground, and destroy its principal use. It should be left *just above, or within the level of the shoe*.

THE SOLE.

This is the under concave and elastic surface of the foot, extending from the crust to the bars and frog. It is not so thick as the crust, because, notwithstanding its situation, it has not so much weight or stress thrown on it as there is on the crust; and because it was intended to expand, in order to prevent concussion, when, by the descent of the bone of the foot, the weight was thrown upon it. It is not so brittle as the crust, and it is more elastic. It is thickest at the toe, because the first and principal stress is thrown on that part. The coffin bone is driven forward and downward in that direction. It is likewise thicker where it unites with the crust than it is towards the centre, for a similar and evident reason, because there the weight is first and principally thrown.

In a state of nature, it is, to a certain degree, hollow. The reason of this is plain. It is intended to descend or yield with the weight of the horse, and by that gradual descent or yielding, most materially

lessen the shock which would result from the sudden action of the weight of the animal in rapid and violent action; and this descent can only be given by a hollow sole. A flat sole, already pressing upon the ground, could not be brought lower; nor could the functions of the frog be then discharged; nor would the foot have so secure a hold. Then if the sole be naturally hollow, the smith must not interfere with this important action. When the foot will bear it, he must pare out sufficient of the horn to preserve the proper concavity, a small portion at the toe and near the crust, and cutting deeper towards the centre; and he must put on a shoe which shall not prevent the descent of the sole; which not only shall not press upon it, but shall leave sufficient room between it and the sole to admit of this descent. If the sole is pressed upon by the coffin-bone, by the lengthening of the elastic leaves, and the shoe will not permit its descent, the sensible part between the coffin-bone and the horn will necessarily be bruised, and inflammation and lameness will ensue. It is from this cause, that if a stone insinuates itself between the shoe and the sole, it produces so much lameness. Of the too great concavity of the sole, or the want of concavity, we shall treat when we arrive at the diseases of the foot.

THE COFFIN-BONE.

We proceed to the interior part of the foot. The lower pastern, a small portion of which is contained in the horny box, has been already described. Beneath it, and altogether inclosed in the hoof is the coffin-bone, or proper bone of the foot. It is fitted to, and fills the fore part of the hoof, occupying about half of it. It is of a light and spongy structure, and filled with numerous holes. Through these pass the blood vessels of the foot, which are necessarily numerous, considering the important and various secretions there carrying on, and the circulation through the foot could not possibly be kept up, if these vessels did not run through the substance of the bone. The holes about the body of the coffin-bone convey the blood to the little leaves with which it is covered; those near the lower part go to the sole. Considering the manner in which this bone is inclosed in the horny box, and yet the important surfaces around and below it which are to be nourished with blood, the circulation which is thus carried on within the very body of the bone is one of the most beautiful provisions of nature that is to be found in the whole of the frame. No inconvenience can arise from occasional or constant pressure, but the bone allows free passage to the blood, and protects it from every possible obstruction.

That which deserves most attention in the coffin-bone is the production of numerous little leaves round its front and sides. They are prolongations of the thick and elastic membrane covering the coffin-bone, and consist of cartilaginous, fleshy plates, proceeding from it, running down the coffin-bone, and corresponding with, and received between the horny leaves that line the inside of the crust. The horny

leaves are secreted from, or produced by the fleshy, and being about five hundred in number, their union with each other is so strong, that no violence can separate them. While the animal is at rest, the whole weight of the horse is supported by them, and not by the sole. This extraordinary fact has been put to the test of experiment. The sole, bars, and frog were removed from the foot of a horse, and yet as he stood, the coffin-bone did not protrude, or in the slightest degree descend; but when the rapidity with which the foot descends is added to the weight of the horse, these little leaves, horny and fleshy, gradually lengthen, and suffer the bones to press upon the sole. The sole then descends, and, in descending, expands; and so, by an admirable mechanism, the violent shock which would be produced by the pressure of such a weight as that of the horse, and the velocity with which it descends, is lessened or destroyed, and the complicated apparatus of the foot remains uninjured. When the foot is again lifted, and the weight which pressed upon it is removed, the principle of elasticity is called into exercise, and by it the sole resumes its concavity, and the horny frog its folded state;—the quarters return to their former situation,—the little leaves regain their former length, and every thing is prepared for a repetition of action.

THE SENSIBLE SOLE.

Between the coffin-bone and the horny sole is situated the sensible sole, formed above of a substance of a ligamentous or tendinous nature, and below of a cuticular or skin-like substance, plentifully supplied with blood-vessels. It was placed between the coffin-bone and the sole, by its yielding nature to assist in preventing concussion, and also to form a supply of horn for the sole. It extends beyond the coffin-bone, but not at all under the frog; leaving a space for the frog, it proceeds over the bars. It is here likewise thicker, and more elastic, and by its elasticity is evidently assisting in obviating concussion. It is supplied with nervous fibres, and is highly sensible, as the slightest experience in horses will evince. The lameness which ensues from the pressure of a stone or of the shoe on the sole is caused by inflammation of the sensible sole. Corns result from bruise and inflammation of the sensible sole, between the crust and the bar.

THE SENSIBLE FROG.

The coffin-bone does not occupy more than one half of the hoof. The posterior part is filled by a soft mass, partly ligamentous, and partly tendinous. Its shape below corresponds with the cavities of the horny frog; in front it is attached to the inferior part of the coffin-bone; and farther back it adheres to the lower part of the cartilages of the heels, where they begin to form the rounded protuberances which constitute the heel of the foot. It occupies the whole of the back part of the foot, above the horny frog, and between the cartilages. Running immediately above the frog, and along the greater part of it, we

find the perforans flexor tendon, which passes over the navicular bone, and is inserted into the heel of the coffin-bone.

THE NAVICULAR-BONE.

This navicular bone is placed behind and below the lower pastern-bone and behind and above the heel of the coffin-bone, so that it forms a joint with both bones, and answers a very important office in strengthening the union between these parts; in receiving a portion of the weight which is thrown on the lower pastern; and in enabling the flexor tendon to act with more advantage. Supposing that this tendon were inserted into the coffin-bone, without the intervention of the navicular-bone, it would act in a very disadvantageous way, in bending the pastern, for it is inserted near the end of the coffin-bone, and the weight, concentrated about the middle of the bone, is far off, and requires a power to raise it proportionate to the distance between the weight and the power, from the centre of motion, which is here the place where the tendon passes over the end of the coffin-bone: but when the navicular bone is interposed, the centre of motion becomes the posterior edge of that bone, where it is in contact with the tendon, and then it will be seen that the distance of the power from the centre of motion is nearly or quite the same as the weight, and very great expenditure of muscular power will be saved. In the one case, the power must be at least double the weight, in the other they will be nearly equal; and also the angle at which the tendon is inserted, is, like the angle produced by the introduction of the knee-bone, considerably more advantageous. We are inclined to believe that this is the principal use of the navicular-bone; but at the same time we are aware of the benefit which accrues from a portion of the weight being taken from the coffin-bone, and thrown on the navicular-bone, and from it on the tendon, and the tendon resting on the elastic frog underneath. The navicular bone is sometimes, but inaccurately, said to descend with the motion of the foot. It does not do that; it cannot; for it is connected both with the pastern and coffin-bones, by inelastic ligaments. When, however, the horny bulb with its tuft of hair, at the back of an oblique fetlock, descends in the rapid gallop, and almost touches the ground, the navicular bone, being as it were a part of the pastern, must descend with it: but with this exception, both in the extending and the bending of the pastern, the navicular bone turns or rolls upon the other bones, rather than descends, or ascends, and with this remarkable advantage, that when the pastern is extended, the navicular bone is placed in that situation which enables the flexor tendon to act with greatest advantage, in again bending the foot.

THE CARTILAGES OF THE FOOT.

There is a groove extending along the upper part of the coffin-bone, and on either side, except at the protuberance which receives the extensor tendon, occupied by cartilage, which, like the crust, is convex outwards, and concave inwards and which extends to the very poste-

rior part of the foot; rising about the quarters, half an inch or more above the hoof, and diminishing in height forward and backward.

As the descent of the sole increases the width of the lower part of the foot, so the elevation of the frog, a portion of it being pressed upward and outward by the action of the navicular-bone and tendon, causes the expansion of its upper part.

It is this expansion upward, which contributes principally to the preservation of the usefulness of the horse, when our destructive methods of shoeing are so calculated to destroy the expansion beneath. In draught horses, from the long continued as well as violent pressure on the frog, and from the frog on the cartilage, inflammation is occasionally produced, which terminates in the cartilages being changed into bony matter.

INFLAMMATION OF THE FOOT, OR ACUTE FOUNDER.

The sensible lamellæ, or fleshy plates on the front and sides of the coffin-bone, being replete with blood-vessels, are, like every other vascular part, liable to inflammation, from its usual causes, and particularly from the violence with which, in rapid and long-continued action, they are lengthened and strained. When in a severely contested race they have been stretched to the utmost; while, at the fullest stride of the horse, his weight was thrown on them with destructive force; or, when the feet have been battered and bruised in a hard day's journey, no one will wonder if inflammation of the over-worked parts should ensue, and the occurrence of it may probably be produced and the disease aggravated by the too prevalent absurd mode of treating the animal. If a horse that has been ridden or driven hard be suffered to stand in the cold, or if his feet be washed and not speedily dried, he is very likely to have "fever in the feet." There is no more fruitful source of inflammation in the human being, or the brute, than these sudden changes of temperature. This has been explained as it regards grease, but it bears more immediately on the point now under consideration. The danger is not confined to change from heat to cold; a sudden transition from cold to heat is as injurious, and therefore it is that so many horses, after having been ridden far in the frost and snow, and placed immediately in a hot stable, and littered up to the knees, are attacked by this complaint. The feet and the lungs are the organs oftenest attacked, because they have previously suffered most by our mismanagement, and are most disposed to take on disease. Whatever would cause slight inflammation of other parts, or trifling general derangement, will produce all its mischief on these organs.

Sometimes there is a sudden change of inflammation from one organ to another. A horse shall have laboured for several days under evident inflammation of the lungs;—all at once that will subside, and the inflammation will appear in the feet, or inflammation of the feet may follow similar affections in the bowels or the eyes.

To the attentive observer the symptoms are clearly marked, and

yet there is no disease so often overlooked by the groom and the carter, and even by the veterinary surgeon. The earliest symptoms of fever in the feet are fidgetiness, frequent shifting of the fore-legs, but no pawing, much less any attempts to reach the belly with the hind-feet. The pulse will soon be quickened, the flanks heaving, the nostrils red, and the horse, by his anxious countenance, and perhaps by moaning, indicating great pain. Presently, he will look about his litter, as if preparing to lie down, but he does not do it immediately; he continues to shift from one foot to another; he is afraid to draw his feet sufficiently under him for the purpose of lying down: but at length he drops. The circumstance of his lying down at an early period of the disease will sufficiently distinguish inflammation of the feet from that of the lungs, in which the horse obstinately persists in standing until he drops from mere exhaustion; and his quietness when down will distinguish it from colic or inflammation of the bowels, in both of which the horse is frequently up and down, and rolling and kicking when down. When the grievance is in the feet, the horse experiences so much relief, from getting rid of the weight painfully distending the inflamed and highly sensible little plates, that he is glad to lie as long as he can. He will likewise, as clearly as in inflammation of the lungs or bowels, point out the seat of disease by looking at the part: his muzzle will sometimes rest on the feet or the affected foot. He must be inattentive who is not aware what all this indicates.

If the feet be now examined, they will be evidently hot; the horse will express pain if they are slightly rapped with a hammer, and the artery at the pastern will throb violently. No great time will now pass, if the disease be suffered to pursue its course, before he will be perfectly unable to rise; or, if he is forced to get up, and one foot be lifted, he will stand with difficulty on the other, or perhaps drop at once from intensity of pain.

The treatment will resemble that of other inflammations, with such differences as the situation of the disease may suggest. Bleeding is indispensable; and that to its fullest extent. If the disease be confined to the fore-feet, four quarts of blood should be taken as soon as possible from the toe of each, at the situation pointed out, and in the manner already described;—poultices of linseed meal, made very soft, should cover the whole of the foot and the pastern, and be frequently renewed, which will promote evaporation from the neighbouring parts, and possibly through the pores of the hoof, and, by softening and suppling the hoof, will relieve its painful pressure on the swelled and tender parts beneath. More fully to accomplish this last purpose, the shoe should be removed, the sole pared as thin as possible, and the crust and particularly the quarters well rasped. All this must be done gently, and with a great deal of patience, for the poor animal can scarcely bear his foot to be meddled with. There is doubt as to the propriety of administering physic. The horse may find it difficult or impossible to rise, in which case much inconvenience will ensue from the operation of physic: or there may be danger, from

the intense character which fever in the feet often assumes, of producing a change of inflammation to the bowels or lungs, in which the irritation of physic would probably be fatal. Sedative and cooling medicines should be diligently administered, consisting of digitalis, nitre, and emetic tartar, in the proportions already recommended.

If no amendment be observed, three quarts of blood should be taken from each foot on the following day, and, in extreme cases, a third bleeding of two quarts may be justifiable, and, instead of the poultice, cloths kept wet with water in which nitre has been dissolved *immediately before*, and in the proportion of an ounce of nitre to a pound of water, may be wrapped round the feet. About the third day a blister may be tried, taking in the whole of the pastern and the coronet; but a cradle must previously be put on the neck of the horse, and the feet must be covered after the blister, or they will probably be sadly blemished. The horse should be kept on mash diet, unless green meat can be procured for him; and even that should not be given too liberally, nor should he, in the slightest degree, be coaxed to eat. When he appears to be recovering, his getting on his feet should not be hurried. It should be left perfectly to his own discretion; nor should even walking exercise be permitted until he stands firm on his feet; when, if the season will permit, two months' run at grass will be very serviceable.

It is not, however, always, or often, that inflammation of the feet is thus easily subdued, and, if it be subdued, it sometimes leaves after it some fearful consequences. The loss of the hoof is not an unfrequent one. About six or seven days from the first attack, a slight separation will begin to appear between the coronet and the hoof. This should be carefully remarked, for the separated horn will never again unite with the parts beneath, but the disunion will extend, and the hoof will be lost. It is true that a new hoof will be formed, but it will be smaller in size and weaker than the first, and will rarely stand hard work. When this separation is observed, it will be a matter of calculation with the proprietor of the horse whether he will suffer the medical treatment to proceed.

PUMICED FEET.

The sensible and horny little plates which were elongated and partially separated during the intensity of the inflammation will not always perfectly unite again, or will have lost much of their elasticity and the coffin-bone, no longer fully supported by them, presses upon the sole, which becomes flattened, or even convex, or projecting, by this unnatural weight, and the horse acquires a PUMICED FOOT. This will also happen when the animal is used too soon after an attack of inflammation of the feet, and before the little plates have regained sufficient strength to support the weight of the horse, or to contract again by their elastic power when they have yielded to the weight. When the coffin-bone is thus thrown on the sole, and renders it

pumiced, the crust at the front of the hoof will "*fall in*," leaving a kind of hollow about the middle of it.

Pumiced feet, especially in horses with large wide feet, are produced not unfrequently without this acute inflammation. Undue work, and especially much battering of the feet on the pavement, will extend and sprain these little plates so much, that they will not have the power to contract, and thus the coffin-bone will be thrown backward on the sole. A very important law of nature will unfortunately soon be active here. when pressure is applied to any part, the absorbents become busy in removing that part; so, when the coffin-bone begins to press upon the sole, the sole becomes thin from the increased wear and tear to which it is subjected from contact with the ground, and also because these absorbents are rapidly taking it away.

This is one of the diseases of the feet for which there is no cure. No skill is competent to effect a re-union between the separated fleshy and horny leaves, or to restore to them the strength and elasticity of which they have been deprived, or to take up that hard horny substance which very speedily fills the space between the crust and the receding coffin-bone. Some efforts have been made to palliate the disease, but they have been only to a very slight extent successful. If horses, on the first appearance of flat foot, were turned out in a dry place, or put into a box for two or three months, sufficient stress would not be thrown on the leaves to increase the evil, and time might be given for the growth of horn enough in the sole to support the coffin-bone; yet we much doubt whether these horses would ever be useful even for ordinary purposes. The slowest work required of them would drive the coffin-bone on the sole, and gradually the projection would reappear, for no power and no length of time can again unite the separated leaves of the coffin-bone and the hoof. All that can be done in the way of palliation is by shoeing. Nothing must press on the projecting and pumiced part. If the projection be not great, a thick bar shoe, is the best thing that can be applied, but should the sole have much descended, a shoe with a very wide web, bevelled off so as not to press on the part, may be used. These means of relief, however, are only temporary, the disease will proceed; and at no great distance of time, the horse will be useless.

CHRONIC FOUNDER.

This is a name conveniently contrived to express those alterations of the foot, and the gradual lameness which either shoeing or mismanagement occasions. It is often a mere cloak for our ignorance of these subjects. The diseases of the foot and their remedies are very imperfectly understood even by the most skilful practitioners.

We may, perhaps, most conveniently divide the slow and fatal progress from soundness to incurable lameness into two classes—that which is accompanied by contraction, and that which exhibits little or no alteration in the external appearance of the foot.

CONTRACTION.

The foot increases in length, and narrows in the quarters, and particularly at the heel, and the frog is diminished in width, and the sole becomes more concave, and the heels higher; and lameness, or at least a shortened and feeling action, ensues.

Here we must premise that there is a great deal more horror of contracted heels than there is any occasion for. Many persons reject a horse at once if the quarters are *wiring in*; but the fact is, that although this is an unnatural form of the hoof, it is slow of growth, and nature kindly makes that provision for the slowly altered form of the hoof, which she does in similar cases: she accommodates the parts to the change of form. As the hoof draws in, the parts beneath, and particularly the coffin-bone and the heels of the coffin-bone, diminish; or, after all, as it is more a change of form than of capacity, as the foot lengthens in proportion as it narrows, so the coffin-bone lengthens, and is as perfectly adjusted as before to the box in which it is placed; and its little leaves are in as intimate and perfect union with those of the crust as before the hoof had begun to change. On this account it is that many horses with very contracted feet are perfectly sound, and no horse should be rejected merely because he has contracted feet.

We are not aware of any thing in the appearance of the feet which would enable us to decide when contraction is or is not destructive to the usefulness of the animal; his manner of going and his capability for work, must be our guides. Lameness usually accompanies the beginning of contraction; it is the invariable attendant on rapid contraction, but it does not always exist when the *wiring in* is slow or of long standing.

The cause of contraction is the want of natural moisture. The unshod colt has seldom contracted feet, nor does the horse at grass acquire them, because the hoof is kept cool and damp by occasional rain and by the regular dew. It is thus rendered supple, and its elasticity is preserved, and the expansive power of the foot is uninjured. The hoof of the stabled horse sometimes has not one drop of moisture on it for several days. The effect of this, in causing the horn to shrink, is sufficiently evident. Hence, the propriety of stopping the feet, as described below. The intelligent and careful groom will not omit it a single night. Cow-dung, with a small portion of clay to give it consistence, is a common and very good stopping: a better one is a piece of thick felt cut to the shape of the sole and soaked in water; this may be procured, ready prepared for use, at any saddler's. The common stopping of tar and grease is peculiarly objectionable, closing the pores of the feet, and ultimately increasing the dryness and brittleness which it was designed to remedy.

The usual management of the farmer's horse, which is often turned out after his daily task is exacted, or at least whose work returns with

the day, and is generally performed where the feet are exposed to moisture, is an excellent preventive against contraction.

Some intelligent persons have complained much of the influence of litter. If the horse stand many hours in the day with his foot embedded in straw, it is supposed that the hoof must be unnaturally heated, and it is said that the horn will curl and contract under the influence of heat. It is seldom, however, that the foot is so surrounded by the litter, that its heat will be sufficiently increased to produce this effect on the thick horn. The heels, sometimes embedded in straw, and then receiving the current of cold air which blows in from the door, may suffer, and grease may result, but the foot is not sufficiently long or deeply covered by the litter to produce a temperature high enough to warp the hoof. We confess, therefore, that we are not the disciples of those who would, during the day, remove all litter from under the horse; we do not like the naked and uncomfortable appearance of the stable; and we cannot forget the difference in our own feelings, whether we stand for an hour or two on the hard stones, or a soft carpet, and especially whether we beat our feet upon the one or the other. We are disposed to say that humanity and a proper care of the foot of the horse should induce us to keep some litter under him during the day; but his feet need not sink so deeply in it that their temperature should be much affected.

If the action of the horse be not materially impaired it is better to let the contraction alone, be it as great as it will. If it has evidently produced considerable lameness, then the owner of the horse will calculate between his value if cured, the expense of the cure, and the probability of failure.

The medical treatment can only be undertaken by a skilful veterinarian, and it will principally consist in getting rid of any inflammation that may then exist, by local bleeding and physic; next, paring the sole to the utmost extent that it will bear; rasping the quarters as deeply as may be, so that they shall not be too much weakened, or the coronary ring injured; then rasping deeply likewise at the toe, and perhaps scoring at the toe. The horse is afterwards made to stand during the day in wet clay, placed in one of the stalls of his stable, and he is moved at night into another stall, and his feet bound up thickly in wet cloths; or he is turned out into wet pasturage, with tips, or, if possible, without them, and his feet are frequently pared out, and the quarters lightly rasped. In five or six months the horn will have grown fairly down, when he may be taken up, and shod with shoes, unattached by nails on the inner sides of the foot, and put to gentle work.

THE NAVICULAR-JOINT DISEASE.

Many horses with well-formed and open feet become sadly and permanently lame, and veterinary surgeons have been much puzzled to find out why. The farrier has had his convenient explanation

"the shoulder;" but the scientific practitioner has not been able to discover an ostensible cause of lameness in the whole limb.

Behind and beneath the lower pastern-bone, and behind and above the heel of the coffin-bone, is a small bone called the navicular or shuttle-bone. It is so placed as to strengthen the union between the lower pastern and the coffin bone, and to enable the flexor tendon, which passes over it, in order to be inserted into the bottom of the coffin-bone, to act with more advantage; it forms a kind of joint with that tendon. There is a great deal of weight thrown on the navicular-bone, and from it on the tendon; and there is a great deal of motion or play between them in the bending and extension of the pasterns. Now it is very easy to conceive that from sudden concussion, or from rapid and overstrained motion, and that perhaps after the animal has been some time at rest, and the parts have not adapted themselves for motion, that there may be too much play between the bone and the tendon; that the delicate membrane which covers the bone, or the cartilage of the bone, may be bruised, and inflamed, and destroyed; and that all the painful effects of an inflamed and opened joint may ensue, and the horse may be dreadfully lame; Numerous dissections have shewn that this joint, formed by the tendon and the bone, has been the frequent, and, we believe it to be, the almost invariable seat of these obscure lamenesses. The membrane covering the cartilage of the bone has been found in an ulcerated state; the cartilage itself has been ulcerated and eaten away; and the bone has become carious or decayed, and bony adhesions have often taken place between the navicular and the pastern and the coffin bones, and this part of the foot has become completely disorganized and useless. This joint is probably the seat of lameness, not only in flat and perfect feet, but in those which become lame *after* contraction; for in proportion as the inner frog is compressed by the contraction of the heels, and the frog is absorbed by that pressure, and the sole is become concave, and the horny frog, and the coffin-bone too, thereby elevated, will there be less room for the action of this joint, and more danger of the tendon and the delicate membrane of the navicular-bone being crushed between that bone and the horny frog.

Stable management has little to do with the production of this disease, any further than if a horse stands idle in the stable several days, and the structure of the foot, and all the apparatus connected with motion, become unused to exertion, and indisposed for it, and he be then suddenly and violently exercised, this membrane is very liable to be bruised and injured. Irregular and undue exercise are the causes in all feet; but the contracted foot, from its alteration of form, is most in danger.

The cure is extremely uncertain. The first object is to abate the inflammation in this very susceptible membrane. Local bleeding, poulticing, and physic will be our principal resources. If there be contraction, this must, if possible, be removed by the means already pointed out. If there be not contraction, it will be prudent to remove

all surrounding pressure by paring the sole and rasping the quarters, and using the shoe without nails on the inner quarter. If attacked on its earliest appearance, and before ulceration of the membrane of the joint has taken place, it may be radically cured, but ulceration of the membrane will be with difficulty healed, and caries of the bone will for ever remain. Blistering the coronet will often assist in promoting a cure by diverting the inflammation to another part, and it will materially quicken the growth of the horn; and a seton passed through the frog by a skilful operator, and approaching as nearly as possible to the seat of disease, has been serviceable.

In cases of old contraction, attended by a short and *feeling* step, *neurotomy*, or the cutting out of a portion of the nerve, may be resorted to with decided advantage. Not only will the lameness be removed, but, by the foot being again brought fully and firmly upon the ground, the inner side of the shoe being unfettered by nails, a portion of the contraction may be removed by the sole being allowed to descend and the foot to expand at each contact with the ground.

Even when the navicular-joint is particularly suspected, if there be no apparent inflammation, (and that would be readily detected by the heat of the foot,) *neurotomy* may be practised with the hope of alleviating the sufferings of the animal, and thus removing a portion of the lameness; but if the lameness be extreme, either with or without contraction, and especially if there be heat about the foot, the operation is dangerous. There is, probably, ulceration of the membrane—possibly, decay of the bone; and the additional friction to which the parts would be subjected, by the freer action of the horse, the sense of pain being removed, would cause that ulceration or decay to proceed more rapidly until the foot would be completely disorganized, or the tendon would be gradually worn through by rubbing against the roughened surface of the bone.

SAND-CRACK.

This, as its name imports, is a *crack* or division of the hoof from above downward, and into which *sand* and dirt are too apt to insinuate themselves; or, as some say, because it most frequently occurs in sandy districts, the heat of the sand applied to the feet, giving them a disposition to crack. They occur both in the fore and the hind feet. In the fore feet they are usually found in the inner quarter, but occasionally in the outer quarter, because at the quarter is the principal stress or effort towards expansion in the foot, and the inner quarter is weaker than the outer. In the hind feet the crack is almost invariably found in the front, because in the digging of the toe into the ground in the act of drawing, the principal stress is in front.

This is a most serious defect. It indicates a brittleness of the crust, sometimes natural, but oftener the consequence of mismanagement or disease, which, in spite of every means adopted, will probably be the source of future annoyance. On a hoof that has once been thus

SAND-CRACK.

divided no dependence can be placed, unless, by great care, the natural suppleness of the horn has been restored and is retained.

The crack sometimes does not penetrate through the horn: it then causes no lameness; nevertheless, it must not be neglected. It shews that brittleness which should make the purchaser pause; and, if proper means are not taken, it will generally soon reach to the quick. It should be pared or rasped fairly out; and if the paring or rasping has been deep, the foot should be strengthened by a coating of pitch, with coarse tape bound over it, and covered by another coating of pitch, and which may be moulded and polished so as to be scarcely distinguishable from the natural horn. Every crack should be pared or rasped to ascertain its depth. If it penetrates through the crust, and no lameness exists, and is situated low down on the foot, a firing iron, red-hot, should be run pretty deeply above and below it to prevent its lengthening; the edges should be a little thinned to remove any painful or injurious pressure; and it should be bound up in the manner directed, taking care that the shoe does not press upon the crust immediately under the crack.

If the crack has penetrated through the crust, and lameness has ensued, the case is more serious. It must be carefully examined to ascertain that no dirt or sand has got into it; the edges must be considerably thinned; and if any fungus is beginning to sprout through the crack, and is imprisoned and pinched there, it must be destroyed by the application of the butyr (chloride) of antimony. This is far preferable to the cautery, because the edges of the horn will not be thickened or roughened, and thus become a source of after irritation. The iron must then be run deeply above and below the crack, as in the other case; a pledget of dry tow must be placed in the crack, with another over it, and the whole bound down as tightly as possible. On the third day the part should be examined, and the caustic again applied if necessary; but if the crack be dry, and defended by a hard horny crust, the sooner the pitch plaster is put on the better. The most serious case is when, from *tread*, or neglect, the coronet is divided. The growth of horn proceeds from the coronary ligament, and unless this is perfect the horn will grow down divided. The method to be adopted here is to run the back of the firing-iron over the coronet at the division. Some inflammation will ensue, and when the scab produced by the cautery peels off, as it will in a few days, the division will be obliterated, and sound and united horn will grow down. In this case, as in almost every case of sand-crack, the horse should be kept as quiet as possible. It is not in the power of any one to effect a perfect cure if the owner will continue to use the animal. When the horn is divided at the coronet it will take five or six months for it to grow fairly down, and not until this takes place should the horse be used, even for ordinary work: but when the horn is grown an inch from the coronet the horse may be turned out, the foot being well defended by the pitch plaster, and that renewed as often as it becomes loose, a bar shoe being worn chambered so as not to press

upon the hoof immediately under the crack, and that shoe being taken off, the sole pared out, and any bulbous projection of the new horn being removed once in every three weeks.

TREAD, OR OVER-REACH.

Under this term are comprised bruises and wounds of the coronet, produced usually in the hind-feet, by the awkward habit of setting one foot upon another, and in the fore-foot by the hinder one *over-reaching* it, and wounding the other near the heel. When properly treated, a tread is seldom productive of much injury. If the dirt be well washed out of it, and a pledget of tow dipped in Friar's balsam be bound over the wound, it will, in the majority of cases, speedily heal. Should the bruise be extensive or the wound deep, a poultice may be applied for one or two days, and then the Friar's balsam, or digestive ointment. Sometimes a soft tumour will form on the part, which will be quickly brought to suppuration by a poultice, and when the matter has run out the ulcer will heal by the application of the Friar's balsam, or a weak solution of blue vitriol.

A tread, or wound of the coronet, should never be neglected, lest gravel should insinuate itself into the wound, and form deep ulcerations called *sinuses* or *pipes*, and which constitute *quittor*; and more particularly the caustic, too frequently used by farriers, should be carefully avoided, not only lest *quittor* should be formed, but lest the coronary ligament should be so injured as to be afterwards incapable of throwing out perfect horn. This defect is called

FALSE QUARTER.

If the coronary ligament by which the horn of the crust is secreted is either divided by the original cut or bruise, or eaten through by the caustic, there will be a division in the horn as it grows down, either in the form of a permanent sand-crack, or one portion of the horn overlapping the other. This is not only a very serious defect, and a frequent cause of lameness, but it is exceedingly difficult to remedy. The coronary ligament must be restored to its perfect state, or at least to the discharge of its perfect function. Much danger would attend the application of the caustic in order to effect this. A blister is rarely sufficiently active, and the application, not too severely, of a heated flat or rounded iron to the coronet at the injured part affords the best chance of success; the edges of the horn on either side of the crack being thinned, the hoof supported, and the separated parts held together by a firm encasement of pitch, as described when speaking of the treatment of sand-crack. The coronet must be examined at least once in every fortnight in order to ascertain whether the desired union has there taken place; and, as a palliative, during the treatment of the case, or if the treatment should be unsuccessful, a bar shoe may be used, and care taken that there be no bearing at or immediately under the separation of the horn. This will be best effected, if the crust be thick and the quarters strong, by paring off a little of the bottom of the

crust at the part, so that it shall not touch the shoe; but if the foot be weak, an indentation, or hollow, should be made in the shoe. Strain or concussion on the immediate part will thus be avoided, and in sudden or violent exertion the crack will not be so likely to extend upward again to the coronet, when whole and sound horn has begun to be formed there.

In some cases false quarter assumes a less injurious character. The horn grows down whole, but the ligament is unable to secrete that which is perfectly healthy, and therefore there is a narrow slip of horn of a different and lighter colour. This is sometimes the best result that can be procured when the surgeon has been able to obliterate the absolute crack or separation. It is, however, to be regarded as a defect, not sufficient to condemn the horse, but indicating that he has had sand-crack, and that a disposition to sand-crack may possibly remain. There will also, in the generality of cases, be some degree of tenderness in that quarter, which may produce slight lameness when unusual exertion is required from the horse, or the shoe is suffered long to press on the part.

QUITTOR.

This has been described as being the result of neglected or bad tread or over-reach; but it may be the consequence of any wound in the foot, and in any part of the foot. In the natural process of ulceration, matter is thrown out from the wound. This precedes the actual healing of the part. The matter which is thrown out in wounds of the foot is usually pent up there, and, increasing in quantity, and thus urging its way in every direction, it forces the fleshy little plates of the coffin-bone, from the horny ones of the crust, or the horny sole from the fleshy sole, or even eats deeply into the internal parts of the foot. These pipes or sinuses run in every direction, and constitute the essence of *quittor*.

If it arise from a wound in the bottom of the foot, the matter which is rapidly formed is pent up there, the nail of the shoe or the *stub* remains in the wound, or the small aperture which was made is immediately closed again. This matter, however, continues to be thrown out, and it separates the horny sole from the fleshy one to a considerable extent, and at length forces its way upward, and appears at the coronet, and usually at the quarter, and there slowly oozes out; but the aperture and the quantity discharged are so small that the inexperienced person would form no idea of the extent of the mischief within, and the difficulty of repairing it. The opening may scarcely admit a probe into it, yet over the greater part of the quarter and the sole the horn may have separated from the foot, and the matter may have penetrated under the cartilages and ligaments, and into the coffin joint; and not only so, but two mischievous results have been produced,—the pressure of the matter wherever it has gone has formed ulcerations that are indisposed to heal, and that require the application of strong and painful stimulants to induce them to heal; and, worse than

this, the horn, once separated from the sensible parts beneath, will never again unite with them.

It will be sufficiently plain that the aid of a skilful practitioner is here requisite, and also the full exercise of the patience of the proprietor of the horse. It may be necessary to remove much of the horny sole, which will be speedily reproduced when the fleshy surface beneath can be brought to a healthy condition; but if much of the horn at the quarters must be taken away, five or six months may probably elapse before it will be sufficiently grown down again to render the horse useful.

Measures of considerable severity are indispensable. The application of some caustic will alone produce a healthy action on the ulcerated surfaces; but on the ground of interest and of humanity we protest against that brutal practice, or at least the extent to which it is carried, of coring out, or deeply destroying the healthy as well as the diseased parts, and parts which no process will again restore, which is pursued by many ignorant smiths. The unhealthy surface must be removed, but the cartilages and ligaments, and even portions of the bone, need not be sacrificed.

When the joints are exposed the case is hopeless; yet, in a great many instances, the bones and the joints are exposed by the remedy and not by the disease. One hint may not be necessary to the practitioner, but it may guide the determination and hopes of the owner if, when the probe is introduced into the fistulous orifice on the coronet, the direction of the *sinuses* or *pipes* is backward, there is much probability that a perfect cure may be effected; but if the direction of the sinuses be forward, the cure is at best doubtful. In the first instance, there is neither bone nor joint to be injured; in the other, the more important parts of the foot are in danger, and the principal action and concussion are found.

Neglected bruises of the sole sometimes lay the foundation for quittor. When the foot is flat, it is very liable to be bruised if the horse is ridden fast over a rough and stony road; or a small stone, insinuating itself between the shoe and the sole, or clipped and confined by the curvature of the shoe, will frequently lame the horse. The heat and tenderness of the part, the occasional redness of the horn, and the absence of puncture, will clearly mark the bruise. The sole must then be thinned, and particularly over the bruised part, and, in neglected cases, it must be pared even to the quick, in order to ascertain whether the inflammation has run on to suppuration. Bleeding at the toe will be clearly indicated,—poultices,—and such other means as have either been described under "Inflammation of the Feet," or will be pointed out under the next head. The principal causes of bruises of the foot are leaving the sole too much exposed by means of a narrow webbed shoe, or the smith paring out the sole too closely, or the pressure of the shoe on the sole, or the introduction of gravel or stones between the shoe and the sole.

PRICK OR WOUND IN THE SOLE OR CRUST.

This is the most frequent cause of quittor. It is evident that the sole is very liable to be wounded by nails, pieces of glass, or even sharp flints, but much more frequently the fleshy plates are wounded by the nail in shoeing; or if the nail does not penetrate through the internal surface of the crust, it is driven so close to it that it presses upon the fleshy parts beneath, and causes irritation and inflammation, and at length ulceration. When a horse becomes suddenly lame, after the legs have been carefully examined and no cause of lameness appears in them, the shoe should be taken off. In many cases the offending substance will be immediately detected, or the additional heat felt in some part of the foot will point out the seat of injury; or, if the crust be rapped with the hammer all round, the flinching of the horse will discover it; or pressure with the pincers will render it evident.

When the shoe is removed for this examination the smith should never be permitted to wrench it off, but each nail should be drawn separately, and examined as it is drawn, when some moisture appearing upon it will not unfrequently reveal the spot at which matter has been thrown out. In the fore-foot the injury will generally be found on the inner quarter, and on the hind-feet near the toe, these being the thinnest parts of the fore and hind-feet.

Sudden lameness occurring within two or three days after the horse has been shod will lead us to suspect that the smith has been in fault; yet no one who considers the thinness of the crust, and the difficulty of shoeing many feet, will blame him for sometimes pricking the horse.

When the seat of mischief is ascertained, the sole should be thinned round it, and, especially at the nail-hole, or the puncture, it should be pared to the quick. The escape of some matter will now probably tell the nature of the injury, and remove its consequences. If it be puncture of the sole by some nail, or any similar thing, all that will be necessary is a little to enlarge the opening, and then to place on it a pledget of tow dipped in Friar's balsam, and over that a little common stopping; or, if there be much heat and lameness, a poultice should be applied.

If the foot has been wounded by the wrong direction of a nail in shoeing, and the sole be well pared out over the part on the first appearance of lameness, little more will be necessary to be done. The opening must be somewhat enlarged, the Friar's balsam applied, and the shoe tacked on, with or without a poultice, according to the degree of lameness or heat, and on the following day all will often be well. It may, however, be prudent to keep the foot stopped for a few days. If the accident has been neglected, and matter begins to be formed, and to be pent up and to press on the neighbouring parts, and the horse evidently suffers extreme pain, and is sometimes scarcely able to put his foot to the ground, and much matter is poured out when the opening is enlarged, further precautions must be adopted. The fact must be recollected that the living and dead horn will never

unite, and every portion of the horny sole that has separated from the fleshy sole above must be removed. *The separation must be followed as far as it reaches.* Much of the success of the treatment depends on this. No small strip or edge of separated horn must be suffered to press upon any part of the wound. The exposed fleshy sole must then be touched, but not too severely, with the butyr (chloride) of antimony, some soft and dry tow placed over the part, and the foot stopped, and a poultice placed over all if the inflammation seems to require it. On the following day a thin pellicle of horn will frequently be found over a part or the whole of the wound. This should be, yet very slightly, touched again with the caustic; but if there be an appearance of fungus sprouting from the exposed surface, the application of the butyr must be more severe, and the tow again placed over it, so as to afford considerable yet uniform pressure. Many days do not often elapse before the new horn covers the whole of the wound. In these extensive openings the Friar's balsam will not often be successful, but the cure must be effected by the judicious and never too severe use of the caustic. Bleeding at the toe, and physic, will be resorted to as useful auxiliaries when much inflammation arises.

In searching the foot to ascertain the existence of prick, there is often something very censurable in the carelessness with which the horn is cut away between the bottom of the crust and the sole, so as to leave little or no hold for the nails, while some months must elapse before the horn will grow down sufficiently far for the shoe to be securely fastened.

When a free opening has been made below, and matter has not broken out at the coronet, it will rarely be necessary to remove any portion of the horn at the quarters, although we may be able to ascertain by the use of the probe that the separation of the crust extends for a considerable space above the sole.

CORNS.

In the angle between the bars and the quarters, the horn of the sole has sometimes a red appearance, and is more spongy and softer than at any other part. The horse flinches when this portion of the horn is pressed upon, and there is occasional or permanent lameness. This disease of the foot is termed CORNS: bearing this resemblance to the corn of the human being, that it is produced by pressure, and is a cause of lameness, but differing from it by the horn, answering to the skin of the human foot, which is thin and weak, instead of being thickened and hardened. When it is neglected, so much inflammation is produced in that part of the sensible sole, that suppuration follows, and to that, quittor, and the matter either undermines the horny sole, or is discharged at the coronet.

The cause is pressure on the sole at that part, by the irritation of which a small quantity of blood is extravasated. The horn is secreted in a less quantity, and of a more spongy nature, and this extravasated blood becomes enclosed in it.

This pressure is produced in various ways. When the foot becomes contracted, the part of the sole inclosed between the external crust which is wiring in, and the bars which are opposing that contraction, is squeezed as it were in a vice, and becomes inflamed; hence it is rare to see a contracted foot without corns. When the shoe is suffered to remain on too long, it becomes imbedded in the heel of the foot: the external crust grows down on the outside of it, and the bearing is thrown on this angular portion of the sole. No part of the sole can bear continued pressure, inflammation and corns would be the result. From the length of wear the shoe sometimes becomes loosened at the heels, and gravel insinuates itself between the shoe and the crust, and accumulates in this angle, and even eats into it and wounds it. The bars are too frequently cut away, and then the heel of the shoe must be bevelled inward in order to answer to this absurd and injurious shaping of the foot; and by this slanting direction of the heel of the shoe inward, an unnatural disposition to contraction is given, and the sole must suffer in two ways, in being pressed upon by the shoe, and being squeezed between the outer crust and the external portion of the bar. The shoe is often made unnecessarily narrow at the heels, by which this angle, seemingly less disposed to bear pressure than any other part of the foot, is exposed to accidental bruises. If, in the paring out of the foot, the smith should leave the bars prominent, he too frequently neglects to pare away the horn in the angle between the bars and the external crust; or if he cuts away the bars, he scarcely touches the horn at this point; and thus, before the horse has been shod a fortnight, the shoe rests on this angle, and produces corns. The use of a shoe for the fore feet, thickened at the heels, is, and especially in weak feet, a source of corns, from the undue bearing there is on the heels, and the concussion to which they are subject.

The unshod colt rarely has corns. The heels have their natural power of expansion, and the sensible sole at this part can scarcely be imprisoned, while the projection of the heel of the crust and the bar is a sufficient defence from external injury. Corns seem to be, to a certain degree, the almost inevitable consequence of shoeing, which, by limiting, or in a manner destroying, the expansibility of the foot, must, when the sole attempts to descend, or the coffin-bone has a backward and downward direction, imprison and injure this portion of the sole; and this evil consequence is increased when the shoe is badly formed or kept on too long, or when the paring is omitted or injudiciously extended to the bars. By this unnatural pressure of the sole, blood is thrown out, and enters into the pores of the soft and diseased horn which is then secreted: therefore we judge of the existence and the extent of the corn by the colour and softness of the horn at this place.

The cure is difficult; for as all shoeing has some tendency to produce pressure here, it is difficult to get rid of the habit of throwing out this diseased horn when it is once contracted.

The first thing to be done is well to pare out the angle between the

crust and the bars. Two objects are answered by this; the extent of the disease will be ascertained, and one cause of it removed.

Treatment. A very small drawing knife must be used for this purpose. The corn must be pared out to the very bottom, taking care not to wound the sole. It will then be discovered whether there be any effusion of blood or matter underneath. If this be suspected, an opening must be made through the horn, the matter evacuated, the separated horn taken away, the course and extent of the sinuses explored, and the treatment recommended for quittor adopted. Should there be no collection of fluid, the butyr of antimony should be applied over the whole extent of the corn, after the horn has been thinned as closely as possible. The object of this is to stimulate the sole to throw out more healthy horn. In bad cases a bar-shoe may be put on, so chambered, that there shall be no pressure on the diseased part. This may be worn for one or two shoeings, but not constantly, for there are few frogs that would bear the constant pressure of the bar-shoe; and the want of the pressure on the heel, generally occasioned by their use, would produce a softened and bulbous state of the heels, which would of itself be an inevitable source of lameness.

In the great majority of cases the corn is either confined to the inner quarter of the foot, or crust. That this should be the case may be easily imagined, from what we have said of contraction being most frequent in the inner quarter. The shoe, unfettered on the inner side, may, in corn on that side, be applied with great benefit if the country be not too heavy, or the pace required from the horse too great.

Next is to be considered the cause of the corn, which a careful examination of the foot and the shoe will easily discover. The cause being ascertained, the effect may, to a great extent, be afterwards removed. Turning out to grass, after the horn is a little grown, first with a bar-shoe, and afterwards with the shoe fettered on one side, or with tips, will often be serviceable. A horse that has once had corns to any considerable extent should, at every shoeing, have the seat of corn well pared out, and the butyr of antimony applied. The *seated* shoe (hereafter to be described) should be used, with a web sufficiently thick to cover the place of corn, and extending as far back as it can be made to do without injury to the frog.

Low weak heels should be rarely touched with the knife, or any thing more be done than lightly to rasp them, to give a level surface. The inner heel should be particularly spared. Corns are seldom found in the hind feet, because the heels are stronger and the feet are not exposed to so much concussion; and when they are found there, they are rarely or never productive of lameness.

THRUSH

Is a discharge of offensive matter from the cleft of the frog. It is inflammation of the lower surface of the sensible frog, and during which pus is secreted together with, or instead of horn. When the frog is in its sound state the cleft sinks but a little way into it; but when it

becomes contracted or otherwise diseased, the cleft extends in length, and penetrates even to the sensible horn within, and through this unnaturally deepened fissure the thrushy discharge proceeds. It is caused by any thing that interferes with the healthy structure and action of the frog. We find it in the hinder feet oftener and worse than in the fore, because in our stable management the hinder feet are too much exposed to the pernicious effect of the dung and the urine, moistening, or as it were macerating, and at the same time irritating them. The distance of the hinder feet from the centre of the circulation would, as in the case of grease, more expose them to accumulations of fluid and discharges of this kind. In the fore feet thrushes are usually connected with contraction. We have stated that they are both the cause and the effect of contraction. The pressure on the frog from the wiring in of the heels will produce pain and inflammation, and the inflammation by the increased heat and suspended function of the part, will dispose to contraction. Horses of all ages, and in almost all situations, are subject to thrush. The unshod colt is frequently thus diseased.

Thrushes are not always accompanied by lameness. In a great many cases the appearance of the foot is scarcely, or not at all altered, and the disease can only be detected by close examination, or the peculiar smell of the discharge. The frog may not appear to be rendered in the slightest degree tender by it, and therefore the horse may not be considered by many as unsound. Every disease, however, should be considered as legal unsoundness, and especially a disease which, although not attended with present detriment, must not be neglected, for it would eventually injure and lame the horse. All other things being right, a horse should not be rejected because he has a slight thrush, for if the shape of the hoof be not altered, experience tells us that the thrush is easily removed; yet if it be not soon removed, it will alter the shape of the foot and the action of the horse, and become manifest unsoundness. The progress of a neglected thrush, although sometimes slow, is sure. The frog begins to contract in size, it becomes rough, ragged, brittle, and tender. The discharge is more copious and more offensive—the horn gradually disappears—a mass of hardened mucous usurps its place—this easily peels off, and the sensible frog remains exposed—the horse cannot bear it to be touched—fungous granulations spring from it—they spread around—the sole becomes underrun, and canker steals over the greater part of the foot.

There are few errors more common or more dangerous, than that the existence of thrush is a matter of little consequence, or even, as some suppose, a benefit to the horse,—a discharge for superabundant humours,—and that it should not be dried up too quickly, and in some cases not dried up at all. If a young colt, fat and full of blood, has a bad thrush, with much discharge, it may be prudent to accompany the attempt at cure by a dose of physic or a course of diuretics; a few diuretics may not be injurious when we are endeavouring to dry up thrush in older horses: but disease can scarcely be attacked too soon

or subdued too rapidly, and especially a disease which steals on so insidiously, and has such fatal consequences in its train. If the heels once begin to contract through the baneful effect of thrush, it will with difficulty, if at all, be afterwards removed.

There are many recipes to stop a running thrush. Almost every application of an astringent but not too caustic nature will have the effect. The common *Ægyptiacum* (vinegar boiled with honey and verdigris) is a very good liniment; but the most effectual and the safest, drying up the discharge speedily, but not suddenly, is a paste composed of two ounces of blue and one of white vitriol powdered as finely as possible, and rubbed down with one pound of tar and two of lard. A pledget of tow covered with it should be introduced as deeply as possible, yet without force, into the cleft of the frog every night, and removed in the morning before the horse goes to work. Attention should at the same time, as in other diseases of the foot, be paid to the apparent cause of the complaint, and that cause should be carefully obviated or removed. Before the application of the paste, the frog should be examined, and every loose part of the horn or hardened discharge removed; and if much of the frog be then exposed, a larger and wider piece of tow covered with the paste may be placed over it, in addition to the pledget introduced into the cleft of the frog. It will be necessary to preserve the frog moist while the cure is in progress, and this may be done by filling the feet with tow covered by common stopping, or using the felt pad, likewise covered with it. Turning out would be prejudicial rather than of benefit to thrushy feet, except the dressing be continued, and the feet defended from moisture.

CANKER

Is a separation of the horn from the sensible part of the foot, and the sprouting of fungus matter instead of it, and occupying a portion of, or even the whole of the sole and frog. It is the occasional consequence of bruise, puncture, corn, quittor, and thrush, and is extremely difficult to cure. It is more frequently the consequence of neglected thrush than of any other disease of the foot. It is oftenest found in, and is almost peculiar to the heavy breed of cart horse, resulting partly from constitutional pre-disposition. Horses with white legs and thick skins, and much hair upon their legs,—are subject to canker, especially if they have had an attack of grease, or their heels are habitually thick and greasy. The disposition to canker is certainly hereditary. The dray horse likewise has this disadvantage, that in order to give him *foot-hold*, it is necessary to raise the heels of the hinder feet so high, that all pressure on the frog is taken away, its functions are destroyed, and it is rendered liable to disease. Canker, however, arises more from the peculiar injury to which the feet of these horses are subject from the enormous shoes with which they are covered, the bulk of the nails with which these shoes are necessarily fastened to the foot, and the strain of the foot, in the violent although short exertion in moving heavy weights; but most of all from the neglect of the feet, and the

filthiness of the stable in these establishments. Although canker is a disease most difficult to remove, it is easily prevented. Attention to

Prevention. the punctures to which these heavy horses, with their clubbed feet and brittle hoofs, are more than any others subject in shoeing, and to the bruises and treads on the coronet, to which with their awkwardness and weight they are so liable, and the greasy heels which a very slight degree of negligence will produce in them, and to the stopping of the thrushes, which are so apt in them to run on to the separation of the horn from the sensible frog, will most materially lessen the number of cankered feet. Where this disease often occurs, the owner of the team may be well assured that there is gross mismanagement either in himself, or his horsekeeper, or smith, and it will rarely be a difficult matter to detect the precise nature of that mismanagement.

The cure of canker is the business of the veterinary surgeon, and a most harassing and tedious business it is. The principles on which he proceeds are first of all to remove the extraneous fungus growth, and here probably he will call in the aid both of the knife and the caustic, or the cautery; he will cut away every portion of horn which is in the slightest degree separated from the sensible parts beneath. He will next endeavour to discourage the growth of fresh fungus, and to bring the foot into that state in which it will again secrete healthy horn: here he will remember that he has to do with the *surface* of the foot; that this is a disease of the surface only, and that there will be no necessity for those deeply-corroding and torturing caustics which will eat to the very bone. A slight and daily application of the chloride of antimony, and that not where the new horn is forming, but only on the surface which continues to be diseased, and accompanied by as firm but equal pressure as can be made—and the careful avoidance of the slightest degree of moisture—the horse being exercised or worked in the mill, or wherever the foot will not be exposed to wet—and that exercise adopted as early as possible, and even from the beginning if the disease is confined to the sole and frog—these means will succeed if the disease is capable of cure. Humanity, perhaps, will dictate, that, considering the long process of cure in a cankered foot, and the daily torture of the caustic, and the suffering which would otherwise result from so large or exposed a surface, the nerves of the leg should be divided to take away the sense of pain; but then especial care must be taken that the horse is placed in such a situation, and exposed to such work, that, being insensible to pain, he may not injuriously batter and bruise diseased parts.

OSSIFICATION OF THE CARTILAGES.

We have spoken of the side cartilages of the foot, occupying a considerable portion of the external side and back part of the foot. They are designed to preserve the expansion of the upper part of the foot, and to preserve it, when that of the lower part is limited or destroyed by shoeing. These cartilages are subject to inflammation, and the

result of that inflammation, is, that the cartilages are absorbed, and bone is substituted in their stead. This ossification frequently accompanies ringbone, but it may exist without any affection of the pastern joint. It is oftenest found in horses of heavy draught. It arises not so much from concussion, as from a species of sprain, for the pace of the horse is slow. The cause, indeed, is not well understood, but of the effect we have too numerous instances. Very few heavy draught horses arrive at old age without this change of structure.

In the healthy state of the foot, these cartilages will readily yield to the pressure of the fingers on the coronet over the quarters, but, by degrees, the resistance becomes greater, and at length bone is formed, and the parts yield no more. No evident inflammation of the foot, or great, or perhaps even perceptible lameness accompanies this change: a mere slight degree of stiffness may have been observed, which, in a horse of more rapid pace, would have been lameness. Even when the change is completed, there is not in many cases any thing more than a slight increase of stiffness, little or not at all interfering with the usefulness of the horse. When this altered structure appears in the lighter horse, the lameness is more decided, and means should be taken to arrest the progress of the change: these are blisters or firing; but, after these parts have become bony, no operation will restore the cartilage.

Connected with ringbone the lameness may be very great. (See ringbone chapter vi.)

WEAKNESS OF THE FOOT.

This is more accurately a bad formation, than a disease; often, indeed, the result of disease, but in many instances the natural construction of the foot. The term *weak foot* is familiar to every horseman, and the consequence is too severely felt by all who have any thing to do with horses. In the slanting of the crust from the coronet to the toe, a less angle is almost invariably formed, amounting probably to not more than forty instead of forty-five degrees; and after the horse has been worked for one or two years the line is not straight, but a little indented or hollow, midway between the coronet and the toe. We have described this as the accompaniment of pumiced feet, but it is often seen in weak feet, which, although they might become pumiced by severity of work, do not otherwise have the sole convex. The crust is not only less oblique than it ought to be, but it has not the smooth, even appearance of the good foot. The surface is sometimes irregularly roughened, but it is much oftener roughened in circles or rings. The form of the crust likewise presents too much the appearance of a cone; the bottom of the foot is unnaturally wide in proportion to the coronet; and the whole of the foot is generally, but not always, larger than it should be.

When the foot is lifted, it will often present a round and circular appearance, with a fulness of frog, that would mislead the inexperienced, and indeed be considered as almost the perfection of structure

but, being examined more closely, many glaring defects will be seen. The sole is flat, and the smith finds that it will bear little or no paring. The bars are small in size. They are not cut away by the smith, but they can be scarcely said to have any existence; the heels are low, so much so that the very coronet seems almost to touch the ground; and the crust, if examined, seems scarcely thick enough to hold the nails. Horses with these feet can never stand much work. They will be subject to corns, to bruises of the sole, to convexity of the sole, to punctures in nailing, to breaking away of the crust, in inflammation of the foot, and to sprain and injury of the pastern, and the fetlock, and the flexor tendon. These feet admit of little improvement. Shoeing as seldom as may be, and with a light, yet wide concave web; little or no paring at the time of shoeing, with as little violent work as possible, and especially on rough roads, may protract for a long period the evil day, but he who buys a horse with these feet will sooner or later have cause to repent his bargain.

CHAPTER IX.

THE SKIN AND ITS DISEASES.

The skin of the horse differs little in construction from that of other animals. It consists of three parts, the *cuticle* or scarf-skin externally—very thin, and somewhat transparent, as is proved by the action of a blister when the cuticle is raised from the true skin beneath, in the form of almost pellucid bladders. The dandriff or scurf, which is brushed out in grooming, consists of scales or portions of the cuticle detached in the gradual change or renewal of this membrane. The parts within the frame as they are separated are carried off by the absorbents—the outer skin is more readily got rid of, in the form of scales. The cuticle is produced by the true skin, and is perforated by all its pores, whether exhalent or absorbent; and it adheres to the true skin through the medium of these pores, and likewise of little eminences or projections, which seem to be prolongations of the nerves of the skin.

Beneath the cuticle is a thin soft substance, through which the pores and eminences of the true skin pass; and on which the horse depends for his colour. The dandriff or scurf of a black horse is as white as that of the lightest grey; and the skin beneath is of the same hue in all. The soft substance is called the *rete mucosum*, from its web-like structure, and its soft mucous consistence.

Under this is the *true skin*, very different in different breeds: thin and highly sensible in the blood horse; thick, and, fortunately for the animal, endowed with far less sensibility, in the common cart horse. Over a great part of the frame it lies upon a very singular muscle, peculiar to quadrupeds, and more extensive and powerful in thin-skinned and thin-haired animals than in those of thicker hides. It reaches

from the poll over the whole of the carcass, and down to the arm before, and stifle behind.

The skin answers the double purpose of protection and strength.

Use.

Where it is necessary that the parts should be bound and knit together it adheres so tightly that we can scarcely raise it. Thus the bones of the knees and the pasterns and the tendons of the legs, on which so much stress is frequently thrown, are securely tied down and kept in their places. It is in order to take additional advantage of this binding and strengthening power that we fire the legs of overworked horses, in whom the sinews have begun to start, and the ligaments of the joints to swell or be displaced. We find the skin tight along the muscles of the back and loins, and down the yet more powerful muscles of the quarters; but in other places it seems to be destined only to protect the parts beneath, and there it is loosely attached, that it may not interfere with the motions of the animal. About the brisket, and within the arms and at the flanks, it hangs even in folds, to allow for the extraordinary distension of those parts in rapid action.

Of its strength we have abundant proof, both in the living and dead animal. Its fibres are interlaced in a most curious and intricate manner, so as, when living, to be scarcely lacerable. It offers considerable resistance even to the knife, and is converted into leather after death.

It is, while the animal is alive, one of the most elastic bodies with which we are acquainted. It not only perfectly adapts itself to the slow growth or decrease of the body, and appears equally to fit, whether the horse is in the plumpest condition or reduced to a skeleton, but when a portion of it is distended to an extraordinary degree in the most powerful action of the muscles, it in a moment again contracts to its usual dimensions. It is principally indebted for this elasticity to almost innumerable little glands which pour out an oily fluid that softens and supple it.

When the horse is in health, and every organ discharges its proper functions, a certain quantity of this unctuous matter is spread over the surface of the skin, and is contained in all the pores that penetrate its substance, and the skin is pliable, easily raised from the texture beneath, easily doubled between the finger and thumb, and presenting that peculiar yielding softness and elasticity which experience has proved are the best proofs of the condition, that is, the general health of the animal. Then, too, from the oiliness and softness of the skin, the hair lies in its natural and proper direction, and is smooth and glossy,—another proof of the condition of the horse. When the system is deranged, and especially the digestive system, and the vessels concerned in the nourishment of the animal cease to act, or act feebly, the vessels of the skin immediately, and to a very marked degree, sympathize; and this oily secretion is no more thrown out, and the skin loses its pliancy, and it is difficult or almost impossible to take it up between the finger and thumb, and, losing its

pliancy, it seems to cling to the animal, and we have that peculiar feeling which we call

HIDE-BOUND.

Hide-bound is not so much a diminution of the cellular or fatty substance between the skin and the muscles and bones beneath, as it is an alteration in the skin itself. It is a hardness and unyieldingness of the skin from the want of the oily matter on its surface, and in its substance which has just been mentioned. It is precisely the difference which is presented to the feeling by well curried and supple leather, and that which has become dry and unyielding.

The surface of the skin becoming dry and hard, the scales of the cuticle no longer yield to the hair, but, separating themselves in every direction, turn the hair various ways, and give that staring coat or irregular direction of the hair which accompanies want of condition. This state of the skin, by proving the impaired functions of the vessels of the skin, shows the impaired function of the vessels every where, and particularly those of the stomach and bowels. The horseman should remember that hide-bound is not so much a disease, as a symptom of disease, and particularly of the digestive organs; and our remedies must be applied not so much to the skin, (although we have, in friction and in warmth, most valuable agents in producing a healthy condition of the integuments,) as to the *cause* of the binding of the coat and the state of the constitution generally. Every disease that can affect the general system is likely to produce this derangement of the functions of the skin. Glanders, when become constitutional, is strongly characterized by the unthrifty appearance of the coat. Chronic cough, grease, farcy, and founder, are accompanied by hide-bound; and diet too sparing, and not adequate to the work exacted, is an unfailing source of it. If the cause be removed, the effect will cease.

Should the cause be obscure, as it frequently is—should the horse wear an unthrifty coat, and his hide cling to his ribs, without any apparent disease, we shall be warranted in tracing it to sympathy with the actual, although not demonstrable suspension of some important secretion, generally in the alimentary canal: therefore a few mashes, and a mild dose of physic, are first indicated, and, simple as they appear to be, they often have a very beneficial effect. The regular action of the bowels being re-established, that of all the organs of the frame will speedily follow. If the horse cannot be spared for physic, alteratives may be administered. There is no better alterative for being hide-bound and having an unthrifty coat than that which is in common use, levigated antimony, nitre, and sulphur; and given, in these cases, in doses of two drachms of the first, three of the second, and four of the last, and repeated every night in a mash, or in the form of ball. The peculiar effect of the antimony and sulphur on the skin, of the sulphur on the bowels, and of the nitre on the urinary organs, will be here advantageously combined.

THE HAIR.

The hair is the natural clothing of all our domestic quadrupeds. It is some protection from violence, and more so from cold; and it varies with the climate in which they live. It springs from below the skin. There are found on the cellular and fatty substance, immediately in contact with the internal surface of the skin, numerous little bulbs, which penetrate into and pass through the true skin, and which arriving at the cuticle, the hair protrudes from the summit of them. The hair itself, when examined through a microscope, is seen to be a little tube, containing a pulpy matter, which runs through the whole length of it, by which probably the hair is fed, and rendered pliant; and the loss of which under disease may add to the hard and unthrifty feeling of the coat of a horse out of condition. There is no essential difference in the structure of the hair in different parts, as the mane, the tail, and the body, except that the former is larger, longer, and stronger.

The base of the bulb whence the hair proceeds being beneath the true skin, it is easy to perceive that the hair will grow again, although the cuticle may have been destroyed. A good blister, although it may remove the cuticle, and seemingly for a while the hair with it, leaves no lasting blemish. Even firing, lightly and skilfully performed, and not penetrating through the skin, does not leave much blemish; but when, in broken knees, as the true skin is cut through, or destroyed, there will ever remain a spot devoid of hair.

PORES OF THE SKIN.

Besides the openings already mentioned, there are others more numerous, through which a vast quantity of aqueous fluid escapes, and perspiration is carried on; and, as in the human being, this actually exists in a state of health and quietness, although imperceptible, yet, when the animal is excited by exercise, or labours under some stages of disease, it becomes visible, and appears in the form of drops.

This process of perspiration is not, however, so far under the control of medicine as in the human being. We can, indeed, abate those profuse perspirations which accompany want of condition, or moulting, or disease, but we cannot easily produce or increase the visible perspiration.

We are not aware of any medicine that will certainly produce it.

There are, however, some medicines, as antimony and sulphur, which have an evident and very considerable effect on the skin, in opening its pores and exciting its vessels to action.

Of the existence of absorbent vessels on the skin, or those which take up some fluid or substance, and convey it into the circulation, we have satisfactory proof. A horse is even more easily salivated than the human being. Salivation has been produced by rubbing a splint with mercurial ointment, previous to blistering; and a very few drachms rubbed on the inside of the thighs will probably produce a greater effect than the practitioner desires.

From some parts of the skin there are peculiar secretions, as that of grease in the heel, and mallenders in the knee.

MOULTING, OR CHANGING THE HAIR.

Twice in the year the hair of the body of the horse is changed. That of the mane and tail remains. The bulbous root of the hair does not die, but the pulpy matter seems to be removed from it, which, thus deprived of its nourishment, perishes and drops off, and a new hair springs at its side from the same bulb. As this is a process extending over the whole of the skin, and requiring a very considerable expenditure of vital power, the health of the animal is generally affected at these times. That energy and vital influence, which should support the whole of the frame, is to a great degree determined to the skin, and the animal is languid, and unequal to much hard work. He perspires greatly with the least unusual exertion, and if he is pressed beyond his strength becomes seriously ill.

The treatment which the groom in this case adopts is most absurd and dangerous. The horse, from the deranged distribution of vital power, is disposed to fever, or he labours under a slight degree of fever, sufficiently indicated by the increased quickness of pulse, redness of nose, and heat of mouth. The lassitude and want of appetite which are the accompaniments of this febrile state, are mistaken for debility; and cordials of various kinds, some of them exceedingly stimulating, are unsparingly administered. Common sense would require, that in this deranged distribution of power, excitants should be scrupulously avoided; not only no cordials should be given, but the usual quantity of food should be diminished—bran mashes should be given—a little fever or alterative medicine should be administered, such as that which we have just described, and the horse should be a little more warmly clothed, and sudden or too great exposure to cold should be guarded against. There is no doubt that spices hasten the process of moulting. The old hair is evidently more speedily thrown off, and the new produced, but this at the expense of greater derangement of the constitution—greater fever—and no little danger, if, during this process of moulting, and while nature is thus unnaturally forced on, disease of a febrile character should attack the animal. Friction may be allowed, to assist the falling off of the old hair, and to loosen the cuticle for the appearance of the new hair, but it should be gentle. The currycomb should by no means be used—even the brush should not be applied too hard or too long. The old hair must not be forced off before the young hair is ready to take its place. The exercise should be moderate—the clothing rather warmer than usual, and the water chilled. Nature adapts the coat to the climate and to the season. The Sheltie has one as long and as thick as that of a bear; and as the summer is short and cold too in those northern islands, the coat is rough and shaggy during the whole of the year. In the deserts of Arabia, where the winter is rarely cold, the coat remains short and glossy throughout the year. In our climate,

the short covering of summer is succeeded in autumn by one of considerably greater length and thickness; and that in its turn yields in the spring to the lighter clothing which summer requires. As a thin and glossy coat adds to the beauty of the horse, and is identified, to a great degree improperly, with his condition, an artificial system has been adopted, by which the coat shall remain of nearly the same length, and that a short one, during the year. Nature changes it with the change of season, man prevents a change of season in the stable. It is always summer there—always sufficiently hot to make a long coat useless, and therefore nature, who accommodates herself to circumstances, does not give it. The exposure to cold during the few hours of exercise may roughen the coat for a little while, but the hot clothing and the hot air of more than twenty hours out of the twenty-four, give the character to the covering which nature bestows on such an animal. This system is not now carried to the injurious extent that it used to be, but it yet partakes too much of absurdity and danger. The inflammatory complaints to which these hot-house animals are subject, and the average shortness of their lives, are sufficient proofs of the error of the practice.

The farmer has, or should have, little to do with this artificial management of the coat, and he may be assured that his hackney will, with his winter hair upon him, be to all intents and purposes in as full condition, and as strong and as stout, as the glossiest-coated horse, if he has been sufficiently and properly fed.

CLIPPING.

As to the newly invented practice of clipping, in some parts of the United States, we doubt whether such deviations from nature rarely come to any good.

While the animal is in action, a sufficient supply of heat is obtained by the action on the capillaries, and the increased developement of temperature; but when the action is suspended, some clothing, natural or artificial, something through which the animal heat shall not escape, is absolutely necessary to prevent the chilling of the frame, the exhaustion of vital power, and the dangerous re-action of fever.

COLOUR.

The colour of the hair, like that of the skin, is influenced by, or depends on, that of the mucous mesh-work under the cuticle.

There is an old saying, that a good horse cannot be of a bad colour; and it is far more necessary to attend to the conformation and points of the horse than to his colour. These observations, however, although they admit of many exceptions, may be useful in guiding to the judicious purchase of the horse.

SURFEIT.

Large pimples or lumps often suddenly appear on the skin of the horse, and especially in the spring; and occasionally they disappear

as quickly as they came. Sometimes they seem to be attended with great itching, but at others they appear not in the least to annoy the animal. When they have remained a few days, the cuticle frequently peels off, and a small scaly spot, though rarely a sore, is left. This is called a surfeit, from its resemblance to some eruptions on the skin of the human being, when indigestible or unwholesome food has been taken. These lumps are, in some cases, confined to the neck; but they oftener spread over the sides, back, loins, and quarters. The cause is enveloped in some obscurity. The disease most frequently appears when the skin is irritable during or after the process of moulting, and when it sympathises most with any disorder of the stomach; therefore, some veterinary surgeons have attributed it to indigestion. It has been known to follow the eating of poisonous herbs or mow-burnt hay, but much oftener it is to be traced to exposure to cold when the skin was previously irritable and the horse heated by exercise; it has also been attributed to the immoderate drinking of cold water when the animal was hot. It is obstruction of some of the pores of the skin and swelling of the surrounding substance, either from primary affection of the skin, or from its sympathy with the digestive organs.

Bleeding will always be beneficial—from three to five quarts may be taken, according to the strength of the horse, the extent of the eruption, and the degree of fever. Physic never does good. If surfeit be connected with some unhealthy affection of the stomach or intestines, it is that which the nausea or subsequent action of the purgative increases. Alteratives will be found useful—and particularly the alterative which was recommended for hide-bound, and in the same doses. These should be given on several successive nights. The night is better than the morning, because the warmth of the stable will cause the antimony and sulphur to act more powerfully on the skin. The horse should be warmly clothed—half an hour's walking exercise should be given, an additional blanket having been thrown over him—such green meat as can be procured should be used in moderate quantities, and the chill should be taken from the water.

Although the eruption may disappear after the bleeding, and that very quickly, it will, if the horse be exposed to cold, come out again as suddenly, and as extensively as before. It will rarely, however, be advisable to repeat the bleeding.

Should the lumps, after several of these alternate appearances and disappearances, remain, and the cuticle and the hair begin extensively to peel off, a worse affection is to be feared, for it is far from unusual for surfeit to precede or degenerate into mange. This disorder, therefore, shall next be considered.

MANGE

Is a pimples or lumpy eruption. After a while the vesicle breaks, the cuticle and the hair fall off, and there is, as in obstinate surfeit, a bare spot left covered with scurf; but some fluid oozes from the skin beneath, and this scurfiness changes to a scab, which likewise soon

peels off, and leaves a wider spot: sometimes another scab succeeds to the first, but oftener a mere scaly, greasy-feeling, bare spot remains. This is attended with considerable itching and tenderness, and, thickening of the skin, which soon becomes more or less folded or puckered. The mange generally first appears on the neck, at the root of the mane, and its existence may be pretty truly ascertained, even before the blotches appear, by the ease with which the short hair at the root of the mane is plucked out. From the neck it spreads upward to the head, or downwards to the withers and back, and occasionally extends over the whole carcass of the horse.

One cause of it, although an unfrequent one, has been stated to be neglected or inveterate surfeit. The more common cause is contagion. Amid the whole list of diseases to which the horse is exposed, there is not one more highly contagious than mange. If it once gets into a stable, it spreads through it, for the slightest contact seems to be sufficient for the communication of this noisome complaint.

If the same brush or currycomb be used on all the horses, the propagation of mange is assured; and horses feeding in the same pasture with a mangy one rarely escape, from the propensity they have to nibble one another. Mange in cattle has been propagated to the horse, and from the horse to cattle, but there is no authenticated instance of the same disease in the dog being communicated to the horse. There is as much difference in the character and appearance of mange in the horse and dog, as between either of them and the itch in the human subject; and the itch has never been communicated to the quadruped, nor the mange of the quadruped to the human being.

Mange has been said to originate in want of cleanliness in the management of the stable. The comfort and the health of the horse demand the strictest cleanliness. The eyes and the lungs frequently suffer from the noxious fumes of the putrefying dung and urine; but, in defiance of common prejudice, there is no authentic instance of mange being the result. It may, however, proceed from poverty. When the animal is half-starved, and the functions of digestion and the powers of the constitution are weakened, we have seen, in the cases of hide-bound and surfeit, that the skin soon sympathises, and we can imagine that mange may occasionally be produced instead of surfeit and hide-bound. Every farmer has proof enough of this being the case. If a horse is turned on a common, where there is scarcely sufficient herbage to satisfy his appetite, or if he is placed in one of those straw-yards which, under the management of mercenary and unfeeling men, are the very abodes of misery, the animal comes up a skeleton, and he comes up mangy too. Poverty and starvation are fruitful sources of mange, but it does not appear that filth has much to do with it, although poverty and filth generally go hand in hand.

The propriety of bleeding in cases of mange must depend on the condition of the patient. If mange be the result of poverty, and the animal is much debilitated, bleeding will be adding power to the cause of the disease. Physic, however, is indispensable. It is the first step

in the progress towards cure. A mercurial ball will be preferable to a common aloetic one, as more certain and effectual in its operation, and the mercury having probably some influence in mitigating the disease. In this, however, mange in the horse resembles the itch in the human being—that medicine alone will never effect a cure. There must be some local application. There is this further similarity, that that which is most effectual in curing this disgraceful complaint in man, must form the basis of every local application as it regards the horse. Sulphur is indispensable in every unguent for mange; it is the sheet-anchor of the veterinary surgeon.

In an early, and not very acute state of mange, one ounce of the flowers of sulphur should be well rubbed down with an equal quantity of train oil, and half an ounce of common turpentine. Farriers are fond of the black sulphur, but that which consists of earthy matter, with the mere dregs of the sulphur, cannot be so effectual as the flowers, which are pure sublimed sulphur. A tolerably stout brush, or even a currycomb, lightly applied, should be used wherever there is any appearance of mange, to remove the dandriff or scurf. After that, the horse should be washed with strong soap and water as far as the disease has extended; and when he has been thoroughly dried, the ointment should be well rubbed in with the naked hand, or with a piece of flannel. More good will be done by a little of the ointment being well rubbed in, than by a great deal being merely smeared over the part. The rubbing should be daily repeated. The sulphur seems to have a direct influence on the disease—the turpentine has an indirect one, by exciting some irritation on the skin of a different nature to that produced by the mange, and under the influence of which the irritation of mange will be diminished, and the disease more easily combated. During the application of the ointment, and as soon as the physic has set, an alterative ball or powder similar to those recommended for the other affections of the skin, should be daily given. If, after some days have passed, no progress should appear to have been made, half a pound of sulphur may be well mixed with a pint of oil of tar, or if that is not to be obtained, a pint of Barbadoes tar, and the affected parts rubbed as before. On every fifth or sixth day the ointment should be washed off with warm soap and water. The progress towards cure will be ascertained, the skin will be cleansed, and its pores opened, for the more effectual application of the ointment.

The horse should be well supplied with nourishing, but not stimulating food. As much green meat as he will eat should be given him, or, what is far better, he should be turned out if the weather is not too cold. It may be useful to add, that, after the horse has been once well dressed with either of these liniments, the danger of contagion ceases. It is necessary, however, to be assured that every mangy place has been anointed.

It will be prudent to give two or three dressings after the horse has been cured apparently, and to continue the alteratives for ten days or a fortnight. The cure being completed, the clothing of the horse

should be well soaked in water, to which a fortieth part of the saturated solution of the chloride of lime has been added; after which, it should be washed with soap and water, and again washed and soaked in a solution of the chloride of lime, as before. Every part of the harness should undergo a similar purification.—The currycomb may be scoured, but the brush should be burnt. The rack and manger, and partitions, and every part of the stable which the horse could possibly have touched, should be well washed with a pint of the chloride of lime being added to three gallons of water. All the wood-work should then be scoured with soap and water, after which a second washing with the chloride of lime and water will render all secure. Some farmers have pulled down their stables when they have been thoroughly infected with mange. This is being unnecessarily cautious. The efficacy of the chloride of lime was not then known: and if it is carefully and sufficiently applied to every part of the stable and its furniture, there cannot afterwards be danger.

Every case of itchiness of the skin should be regarded with suspicion. When a horse is seen to rub the root of his tail, or his head or neck, against the manger, the parts should be carefully examined. Some of the hair may have been rubbed or torn off, but if the roots remain firmly adherent, and there be only redness and not scurfiness of the skin, it probably is not mange, but only inflammation of the skin, from too great fulness of blood. A little blood should be taken away—a purgative administered, and the alteratives given. The mange ointment cannot do harm, and may possibly prevent this heat of the skin from degenerating into mange, or stop the progress of mange, if it has commenced. If a scurfiness of skin should appear on any of the points that are pressed upon by the collar or harness, the veterinary surgeon will do right to guard against danger, by alterative medicine and the use of the ointment.

WARTS.

These are tumours of variable size, arising first from the cuticle, and afterwards connected with the true skin by means of the vessels which supply the growth of the tumours. They are found sometimes on the eyelids, on various parts of the skin, and on the prepuce. They must be removed by an operation. If the root be very small, it may be snipped asunder with a pair of scissors, close to the skin, and the root touched with the lunar caustic. If the pedicle or stem be somewhat larger, a ligature of waxed silk may be passed firmly round it, and tightened every day. The source of nutriment being thus cut off, the tumour will, in a few days, die and drop off. If they are large, or in considerable clusters, it will be necessary to cast the horse, to cut them off close to the skin, and sear the root with a red-hot iron. Unless these precautions are used, the warts will speedily sprout again.

CHAPTER X.

ON SOUNDNESS, AND THE PURCHASE AND SALE OF HORSES.

THERE are few sources of greater annoyance both to the buyer and the seller of the horse, than disputes with regard to the soundness of the animal. Although, in describing the various parts of the horse, we have glanced at the connexion of certain natural conformations and some alterations of structure, and accidents, and diseases, with the question of soundness and unsoundness, it may not be uninteresting to those for whom our work was designed, if we now bring into one point of view the substance of that which has been scattered over many pages.

That horse is sound in whom there is no disease, nor any alteration of structure in any part which impairs, or is likely to impair his natural usefulness. That horse is unsound that labours under disease, or that has some alteration of structure that does interfere, or is likely to interfere with his natural usefulness. The term '*natural usefulness*,' must be borne in mind. One horse may possess great speed, but is soon disabled; another will work all day, but cannot be got beyond a snail's pace: one with a heavy forehead is liable to stumble, and is continually putting to hazard the neck of the rider; another, with an irritable constitution and a washy make, loses his appetite and begins to scour if a little extra work is exacted from him. The term unsoundness cannot be applied to either of these; it would be opening far too widely a door to disputation and endless wrangling. The buyer can discern, or ought to know, whether the form of the horse is that which will render him likely to suit his purpose, and he should try him sufficiently to ascertain his natural strength, endurance, and manner of going. Unsoundness, we repeat, has reference only to disease, or to that alteration of structure which is connected with, or will produce disease, and lessen the usefulness of the animal.

These principles will be best illustrated by a brief consideration of the usual supposed causes of unsoundness.

BROKEN-KNEES certainly do not constitute unsoundness after the wounds are healed, unless they interfere with the action of the joint, for the horse may have fallen from mere accident, or through the fault of the rider; but no person would buy a horse with broken-knees until he had thoroughly tried him, and satisfied himself as to his form and action.

CAPPED HOCKS may be produced by lying on an unevenly paved stable with a scanty supply of litter, or by kicking; in neither of which cases would they constitute unsoundness, though in the latter they would be an indication of vice: but in the majority of instances, they are either the consequence of sprain of the hock, and accompanied by enlargement of it, when they would be unsoundness.

CONTRACTION is a considerable deviation from the natural form of the foot but not necessarily constituting unsoundness; it requires,

however, a most careful examination on the part of the purchaser or farrier, to ascertain that there is no heat about the quarter, or ossification of the cartilage; that the frog, although diminished in size, is not diseased, that the horse does not step short, and go as if the foot were tender, and that there is not the slightest trace of lameness. Unless these circumstances, or some of them, are detected, a horse must not be pronounced to be unsound because his feet are contracted, for many horses with strangely contracted feet, are never lame: a special warranty, however, should be required where the feet are at all contracted.

CORNS manifestly constitute unsoundness. The portion of the foot in which they are situated will not bear the ordinary pressure of the shoe; and any accidental additional pressure from the growing down of the horn, or the introduction of dirt or gravel, will cause serious lameness. They render it necessary to wear a thick and heavy shoe, or a bar-shoe, to protect the weakened and diseased part; and corns are very seldom radically cured.

COUGH.—This is a disease, and consequently unsoundness. How ever slight may be its degree, and of whatever short standing it is, although it may sometimes seem scarcely to interfere with the usefulness of the horse, a change of stabling, or slight exposure to wet and cold, or the least over-exertion, may at other times cause it to degenerate into many dangerous complaints. A horse, therefore, should never be purchased with a cough upon him without a special warranty; or if, the cough not being observed, he is purchased under a general warranty, he may be returned as soon as it is discovered.

ROARING, WHEEZING, WHISTLING, HIGH-BLOWING, AND GRUNTING, being the result of alteration of structure, or disease in some of the air passages, and interfering with the perfect freedom of breathing, and especially when the horse is put on his speed, without doubt constitute unsoundness. **BROKEN-WIND** is still more decidedly unsoundness.

CRIB-BITING.—Although there is some difference of opinion among farriers on this point, crib-biting must be regarded as unsoundness. This unnatural sucking in of the air must be to a certain degree injurious to digestion, must dispose to colic, and so interfere with the strength, usefulness, and health of the horse. Some crib-biters are good goers, but they probably would have possessed more endurance had they not acquired this habit; and it is a fact well established, that as soon as a horse begins to become a crib-biter he, in more than nine cases out of ten, begins to lose condition. He is not, to the experienced eye, the horse he was before. It may not lead on to absolute disease, or it may rarely do so to any considerable degree; but a horse that is deficient in condition, must, to that extent, have his capability for extraordinary work diminished, although not so as often to be apparent in ordinary work, and so far, the horse is unsound. Were there no other consideration, the wear of the front teeth, and even the frequent breaking of them, make a horse old before his time, and sometimes render it difficult or almost impossible for him to graze,

when the state of the animal or the convenience of the owner require that he should be turned out.

CURB constitutes unsoundness while it lasts, and perhaps while the swelling remains, although the inflammation may have subsided; for a horse that has once thrown out a curb, is, for a while at least, very liable to do so again on the slightest extra exertion.

CUTTING, as rendering a horse liable to serious injury of the legs, and indicating that he is either weak, or has an awkwardness of gait inconsistent with safety, should be considered as unsoundness. Many horses go lame for a considerable period after cutting themselves severely; and others have dropped from the sudden agony, and endangered themselves and their riders. As some doubt, however, exists on this subject, and as it is a very material objection to a horse, cutting, when evident, should have its serious consequences provided against by a special warranty.

ENLARGED GLANDS.—The enlargement of the glands under the jaw has not been so much considered as it ought, in our estimate of the soundness of the horse. Simple catarrh will occasionally, and severe affection of the chest will generally be accompanied by swelling of these glands, and which does not subside for a considerable time after the cold or fever has apparently been cured. To a slight enlargement of the glands under the jaw much attention need not be paid; but if they are of considerable size, and especially if they are tender, and the gland at the root of the ear partakes of the enlargement, and the membrane of the nose is redder than it should be, we should hesitate in pronouncing that horse to be sound. We should fear the commencement, or the insidious lurking of disease.

ENLARGED HOCK.—A horse with enlarged hock is unsound. The structure of this complicated joint being so materially affected, that although the horse may appear for a considerable time to do ordinary work well, he will occasionally fail even as to that, and a few days' hard work will always lame him.

THE EYES.—That inflammation of the eye of the horse which usually terminates in blindness of one or both eyes, has the peculiar character of remitting or disappearing for a time, once or twice, or thrice, before it fully runs its course. The eye, after an attack of inflammation, regains so nearly its former natural brilliancy, that a man well acquainted with horses will not always recognize the traces of former disease. After a time, however, the inflammation returns, and the result is unavoidable. A horse from four to six years of age that has had one attack of this complaint, is long afterwards unsound, however perfect the eye may seem to be, because he carries about with him a disease that will again break out, and eventually destroy the sight. Whether, therefore, he may be returned or not, depends on the possibility of proving an attack of inflammation of the eye, prior to the purchase. Next to direct evidences of this are appearances about the eye, of which the farrier at least ought not to be ignorant. They have been described. They consist chiefly of a puckering of

the lids towards the inner corner of one or both eyes—a difference, although perhaps only a slight one, and not discovered except it be looked for, in the size of the eyes; a gloominess of the eye, a dulness of the iris, a little dulness of the transparent part of the eye generally, —a minute, faint, dusky spot, deep in the eye, and generally with little radiations of white lines proceeding from it: if these symptoms, or the majority of them, were observed at the time of purchase, the animal had assuredly been diseased before, and is unsound. Starting is an equivocal proof. It is usually an indication of defective sight, but it is occasionally a trick. Connected, however, with the appearances just described, it is a very strong corroborative proof.

If a man buys a horse actually blind, he may repent of his bargain, but he cannot get rid of it. He should be more careful, and the law will not protect him if he does not use common precaution.

LAMENESS, from whatever cause arising, is unsoundness. However temporary it may be, or however obscure, it lessens the utility of the horse, and renders him unsound for the time. How far his soundness may be afterwards affected, must depend on the circumstances of the case. A lame horse is for the time an unsound one.

NEUROTOMY.—A question has arisen how far a horse that has undergone the operation of the division of the nerve of the leg, and has recovered from the lameness with which he was before affected, and stands his work well, may be considered to be sound. In our opinion there cannot be a doubt about the matter. Does the operation of neurotomy render a horse as capable of work as he was before he became affected with the disease on account of which, and to relieve him from the torture of which, the nerve was divided? Is the operation of neurotomy so invariably followed by capability, and continued capability of ordinary and even extraordinary work, that they may regularly be considered as cause and effect? The most strenuous defenders of the nerve operation cannot affirm this. They can only say that they partially succeed in almost every fair case,—that they perfectly succeed in the majority of cases; but they cannot deny that the horse will batter and bruise that foot, when he has lost sensation in it, which should have been tenderly used; that even the hoof will sometimes be lost, after operations performed with the greatest judgment; that the lameness will sometimes return, after the animal has gone sound, one, two, or three years; and that, after all, there is a little unpleasantness, and even unsafeness in the action of the horse, from the peculiar manner in which the foot meets the ground when its feeling is destroyed; and that the horse is more liable to accidents, for he will travel on without warning his rider of the evil, after a piece of glass has penetrated his foot, or a stone has insinuated itself between the sole and the shoe; and thus irreparable mischief will be done, before the cause of it can possibly be detected. A horse on whom this operation has been performed may be improved—may cease to be lame, may go well for many years; but there is no certainty of his continuing to do so, and he is unsound.

OSSIFICATION OF THE LATERAL CARTILAGES constitutes unsoundness, as interfering with the natural expansion of the foot, and in horses of quick work almost invariably producing lameness.

BIG-HEAD.—The first symptoms of this disease may be discovered in almost every part of the system. It is accompanied with pain in the bones, and general weakness. The jaw is said to be the final location of the disease, where it produces a species of cartilage or porous bone. A gentleman of high respectability just informed us that he had dissected several horses that died with the big-head, and that in every instance he found this substance situated on the outside of the jaw-bone, near the last grinders. This discovery led him to the following remedy in several cases, all of which proved effectual. With an inch chisel, he made an incision through the outer coat, so as to apply a hot iron to the cartilage as soon as it began to form. This stopped its growth, and the horses recovered.

The following letter from a high source in Kentucky, contains a remedy which is said to be much approved of at the present time. We extract it from the *Sporting Magazine*.

"In reply to your correspondent in relation to the cure of the *big-head* in horses, I would inform him that the cure is simple, easy, and certain, and is effected by simply touching the parts most enlarged, with aquafortis, and letting it remain long enough to produce inflammation. If too much is applied, and the burning causes too severe pain, and is likely to go too deep, it may be stopped by applying a little soft oil or hogslard. In obstinate cases, a second or third application may be necessary; but not until the first has healed, and showed evident signs of not effecting a cure.

"In eight or ten instances I have seen it tried; I have not known a second application necessary more than once or twice.

"The big-head is a disease of frequent occurrence in Kentucky, and I have known the above remedy used for seven or eight years, without a single failure to produce a cure. The aquafortis is usually put on with a feather or sponge, and applied on each side of the jaw, and on each side of the face, between the eyes and nostrils."

A. J. C—.

PUMICED-FOOT.—When the union between the horny and sensible lamellæ, or little plates of the foot is weakened, and the coffin-bone is let down, and presses upon the sole, which yields to this unnatural weight, and becomes rounded, bruised and injured, that horse must be unsound for ever, because there are no means by which we can lift up the coffin-bone again into its place.

QUIDDING.—If the mastication of the food gives pain to the animal, in consequence of soreness of the mouth or throat, he will drop it before it is perfectly chewed. This, as an indication of disease, constitutes unsoundness. Quidding sometimes arises from irregularity in the teeth, which wound the cheek with their sharp edges; or a protruding tooth renders it impossible for the horse to close his jaws so as to chew his food thoroughly. Quidding is unsoundness for the time; but it

will cease when the teeth are properly filed, or the catarrh relieved, or the cause of this imperfect chewing removed.

QUITTOR is unsoundness.

RING-BONE.—Although when the bony tumour is small, and on one side only, there is little or no lameness, and there are a few instances in which a horse with ring-bone has worked for many years without lameness; yet, from the action of the foot, and the stress upon the part, the inflammation and the formation of bone have such a tendency rapidly to spread, that we must pronounce the slightest enlargement of the pasterns or around the coronet, to be a cause of unsoundness.

SAND-CRACK is manifestly unsoundness; but it may occur without the slightest warning. Its usual cause is too great brittleness of the crust of the hoof; but there is no infallible method of detecting this, or the degree in which it must exist to constitute unsoundness. When the horn round the bottom of the foot has chipped off so much that only a skilful smith can fasten the shoe without pricking the horse, or even when there is a tendency in the horn to chip and break off in a much less degree than this, the horse may probably be returned as unsound, for this brittleness of the crust is a disease of the part, or it is such an altered structure of it as to interfere materially with the usefulness of the animal.

SPAVIN is unsoundness, whether the bony or the blood-spavin. In the first, lameness is produced, at least at starting, in ninety-nine cases out of a hundred, and there is enlargement of the hock, which rapidly spreads with quick and hard work, although the horse may be capable of, and may even get better at slow work. If there be no lameness, we would yet reject a spavined horse, because the bony enlargement is too near a very important and complicated joint, and on the least injury or sprain of that joint would spread over it, and materially interfere with its motion.

BLOOD-SPAVIN is unsoundness, because, although it may not be productive of lameness at slow work, the rapid and powerful action of the hock, in quicker motion will produce permanent, although not considerable lameness, and which can scarcely ever be with certainty removed.

SPLINT.—It depends entirely on the situation of the bony tumour on the inside of the shank-bone, whether it is to be considered as unsoundness. If it is not in the neighbourhood of any joint, so as to interfere with its action, and if it does not press upon any ligament or tendon, it can be no cause of unsoundness, although it is often very unsightly. It does not lessen the capability and value of the animal.

SPRING-HALT.—This singular and very unpleasant action of the hind leg cannot be termed unsoundness. It is an irregular communication of nervous energy to some muscle of the thigh, observable when the horse first comes from the stable, and gradually ceasing on exercise, and has usually been found in those horses that have a more than common degree of strength and endurance.

THICKENING OF THE BACK SINEWS.—Sufficient attention is not always paid to the fineness of the legs of the horse. If the flexor tendons have been sprained so as to produce considerable thickening of the cellular substance in which their sheaths are enveloped, they will long afterwards, or perhaps ever after, be liable to sprain from causes by which they would otherwise be scarcely affected. The continuance of any considerable thickness around the sheaths of the tendons indicates previous and violent sprain. This very thickening will fetter the action of the tendons, and after much quick work will, from the very friction, occasionally renew the inflammation and the lameness; therefore, such a horse cannot be sound. It requires, however, a little discrimination to distinguish this from the *gumminess* or roundness of leg, peculiar to some breeds. There should be an evident difference between the injured leg and the others.

THOROUGH-PIN, except it be of great size, is rarely productive of lameness, and therefore cannot, when unaccompanied by lameness, be termed unsoundness; but as it is the consequence of hard work, and now and then does produce lameness, the hock should be most carefully examined, and there should be a special warranty against it.

THRUSH.—Thrush has not been considered by legal men as unsoundness: it seemed to be necessary to prove lameness, or probable injury to the foot. We confess, however, that we are inclined to consider thrush as unsoundness. We are compelled to consider it so according to our definition, that every disease is unsoundness. It is inflammation of the lower surface of the inner or sensible frog, and the secretion or throwing out of pus, almost invariably accompanied by a slight degree of tenderness of the frog itself, or of the heel a little above it, and if neglected, leading to diminution of the substance of the frog, and separation of the horn from the parts beneath, and undermining, and the production of fungus, canker, and ultimately a diseased state of the foot, destructive of the present, and dangerous to the future usefulness of the horse.

WIND-GALLS.—There are few horses perfectly free from wind-galls, but they do not interfere with the action of the fetlock, or cause lameness, except when they are numerous or large. They constitute unsoundness only when they cause lameness, or are so large and numerous as to render it likely that they will soon cause it.

In the purchase of a horse the buyer usually receives, embodied in the receipt, what is termed a WARRANTY. It should be thus expressed:—

‘Received of A. B. one hundred dollars for a grey mare, warranted only five years old, sound, free from vice, and quiet to ride and drive. C. D.’
\$100.

A receipt, including merely the word ‘warranted,’ extends only to soundness,—‘warranted sound’ extends no further; the age, freedom from vice, and quietness to ride and drive, should be especially named. This warranty extends to every cause of unsoundness that can be detected, or that lurks in the constitution at the time of sale, and to

every vicious habit which the animal has hitherto shewn. To establish a breach of the warranty, and to be enabled to return the horse or recover the price, *the purchaser must prove that it was unsound or viciously disposed at the time of sale.* In case of cough, the horse must have been heard to cough previous to the purchase. Coughing, even on the following morning, will not be sufficient; for it is possible that he might have caught cold by change of stabling. If he is lame, it must be proved to arise from a cause that could not have occurred after the animal was in the purchaser's possession. *No price will imply a warranty,* or be equivalent to one; there must be an *express warranty.* The warranty should be given at the time of sale. A warranty, or a promise to warrant the horse, given at any period antecedent to the sale, is invalid; for the horse is a very perishable commodity, and his constitution and his usefulness may undergo a considerable change in a few days.

If the horse should be afterwards discovered to have been unsound at the time of warranty, the buyer may return him.

When a horse is returned, and an action brought for the price, it will be indispensable that in every other respect, except the alleged unsoundness, the animal shall be as perfect and valuable as when bought.

The purchaser, possibly, may like the horse notwithstanding his discovered defect, and he may retain and bring his action for the depreciation in value on account of the unsoundness. Few, however, will do this, because the detention of the horse will cause a suspicion that the defect was of no great consequence, and will give rise to much cavil about the quantum of damages, and, after all, very slight damages will probably be obtained.

Where there is no warranty, an action may be brought on the ground of fraud, but this is very difficult to be maintained, and few possibly will hazard it. It will be necessary to prove that the dealer knew the defect, and that the purchaser was imposed upon by his false representation; and that, too, in a case in which a person of ordinary circumspection might have been imposed upon. If the defect was evident to every eye, the purchaser has no remedy—he should have taken more care; but if a warranty was given, it extends to all unsoundness, palpable or concealed. Although a person should ignorantly or carelessly buy a blind horse, warranted sound, he may return it—the warranty is his guard, and prevents him from so closely examining the horse as he otherwise would have done; but if he buys a blind horse, thinking him to be sound, and without a warranty, he has no remedy. The law supposes every one to exercise common circumspection and common sense.

A man should have a more perfect knowledge of horses than falls to the lot of most men, and a perfect knowledge of the vendor too, who ventures to buy a horse without a warranty.

Exchanges, whether of one horse absolutely for another, or a sum of money being paid in addition by one of the parties, stand on the

same ground as simple sales. If there is a warranty on either side, and that is broken, the exchange is vitiated: if there be no warranty, deceit must be proved.

The subject of trial is a very intricate one, and we are inclined to think that the dealer is often very ill-used. It is well known that a horse from a dealer's stable is seldom or never fit for hard work until he has undergone some preparation and training. It is right that the purchaser should have a trial of him, but he should try him in a fair way—in a way consistent with the state in which the animal is. If a horse from a dealer's stable is galloped far and fast, it is probable that he will soon show distress; and if he is pushed farther, inflammation and death may ensue. The dealer rarely gets recompensed for this, and if it should occur soon after the sale, the horse is returned, or an action is brought for its price.

In most great towns, there are repositories or stables, for the sale of horses. They are of great convenience to the seller: they are also convenient to the purchaser, who can thus in a large town soon find a horse that will suit him.

CHAPTER XI.

OPERATIONS.

THESE belong more to the veterinary surgeon than to the proprietor of the horse, but a short account of the manner of conducting the principal ones should not be omitted.

It is frequently necessary to bind the human patient, and in no painful or dangerous operation should this preliminary be omitted. It is more necessary to bind the horse, who is not under the control of reason, and whose struggles may not only be injurious to himself but dangerous to the operator.

The *side-line* is a very simple and useful method of confining the horse, and places him in sufficient subjection for the operations of docking, nicking, and slight firing. The long line of the *hobbles*, or a common cartrope with a noose at the end, is fastened on the pastern of one hind-leg. The rope is then brought over the neck and round the withers, and there tied to the portion that comes from the leg. The leg may thus be drawn so far forward, that while the horse evidently cannot kick with that leg, he is disarmed of the other; for he would not have sufficient support under him if he attempted to raise it. Neither can he easily use his fore-legs, or, if he attempts to use them, one may be lifted up, when he becomes nearly powerless. If necessary, the aid of the twitch or the barnacles may be resorted to.

For every minor operation, and even for many that are of more importance, this mode of restraint is sufficient; especially if the operator has active and determined assistants: and we confess that we are

no friends to the casting of horses if it can possibly be prevented. When both legs are included in the hobble or rope (as in another way of using the side line,) the horse may appear to be more secure, but there is greater danger of his falling in his violent struggles during the operation.

For castrating and severe firing the animal must be thrown. The construction of the *hobbles* is well known to every farrier, and almost to every proprietor of horses. We will only say that the safety of the horse and of the operator will require the use of the *improved* hobbles, by which any leg may be released from confinement, and returned to it at pleasure; and, when the operation is ended, the whole of the legs may be set at liberty at once without danger. The method of putting the legs as closely together as possible before the pull,—the necessity of the assistants all pulling together,—and the power, which one man standing at the head and firmly holding the snaffle bridle, and another at the haunch pushing the horse when he is beginning to fall, have in bringing him on the proper side, and on the very spot on which he is intended to lie, need not to be described. This however, is a method of securing the horse to which we repeat that we are not partial, and to which we should not resort except necessity compelled, for in the act of falling, and in the struggles after falling, many accidents have occurred both to the horse and the surgeon.

Among the minor methods of restraint, but sufficient for many purposes, are the *twitch* and the *barnacles*. The former consists of a noose passed through a hole at the end of a strong stick, and in which the muzzle is inclosed. The stick being turned, the muzzle is securely retained while the horse suffers great pain from the pressure—sufficiently great to render him comparatively inattentive to that which is produced by the operation; at the same time, he is afraid to struggle, for every motion increases the agony caused by the twitch, or the assistant has power to increase it by giving an additional turn to the stick.

The *barnacles* are the handles of the pinchers placed over and inclosing the muzzle, and which, being compressed by the assistant give pain almost equal to that of the twitch. These may appear to be barbarous modes of enforcing submission, but they are absolutely indispensable. In a few instances, the blindfolding of the horse terrifies him into submission; but this is not to be depended upon. The twitch should be resorted to when the least resistance is offered; and when that, as it occasionally does, renders the horse more violent, recourse must be had to the side-line or the hobbles.

In painful examination of the fore-leg or foot while on the ground, the other foot should be held up by an assistant; or, if his aid be required in an operation, the knee may be fully bent, and the pastern tied up to the arm. When the hind-leg is to be examined in the same way, the fore-leg on that side should be held or fastened up.

BLEEDING.

The operation of BLEEDING has been already described (p. 88,) but we would remind our readers of the necessity, in every case of acute inflammation, of making a large orifice, and abstracting the blood as rapidly as possible, for the constitution will thus be the more speedily and beneficially affected; and also, of the propriety of never determining to take a precise quantity of blood, but of keeping the finger on the artery until the pulse begins to change;—until the strong pulse of fever becomes softer, or the animal is faint, or the oppressed pulse of inflammation of the lungs is rounder and fuller.

In cases of inflammation, and in the hands of a skilful practitioner bleeding is the sheet-anchor of the veterinarian; yet few things are more to be reprobated than the indiscriminate bleeding of the groom or the farrier.

The change which takes place in the blood after it is drawn from the vein is very diligently noticed by many practitioners, and is certainly deserving of some attention. The blood coagulates soon after it is taken from the vein. The coagulable part is composed of two substances, that which gives colour to the blood, and that in which the red particles float. These, by degrees, separate from each other, and the red particles sink to the bottom. If the coagulation takes place slowly, the red particles have more time to sink through the fluid, and there appears on the top a thick, yellowish, adhesive coat, called the buffy coat. It is supposed that the slowness of coagulation, and the thickness of buffy coat, are indicative of inflammation, and of the degree of inflammation.

In a healthy state of the system, the coagulation is more rapid, the red particles have not time to fall through, and the buffy coat is thin. These appearances are worth observing; but much more dependence is to be placed on the pulse, the change of the pulse, and the symptoms generally. When the horse is exhausted, and the system nearly broken up, the blood will sometimes not coagulate at all, but be of one uniform black colour, and loose texture. When the blood runs down the side of the vessel in which it is received, the coagulation will be very imperfect. When it is drawn in a full stream, it coagulates slowly; when more slowly, or from a smaller orifice, the coagulation is more rapid: therefore, all these extraneous circumstances affecting so much the coagulation and consequent appearance of the blood, the pulse, and the general symptoms, should be the chief objects of regard.

BLISTERING.

Of BLISTERS we have often spoken when treating of the various diseases to which they are applicable. The principle on which they act, is that no two intense inflammations can exist in neighbouring parts, or perhaps in the system, at the same time. Hence we apply some stimulating acrimonious substance to the skin, to excite external inflammation, and to lessen or draw away inflammation in some deeper

seated and generally not far distant part. Thus we blister the sides in inflammation of the lungs—the belly in that of the bowels—the legs in that of the cellular substance surrounding the sheaths of the tendons, or the sheaths themselves, and the coronet or the heel in inflammation of the navicular joint.

Blisters have likewise the property of increasing the activity of the neighbouring vessels: thus we blister to bring the tumour of strangles more speedily to a head—we blister to rouse the absorbents to more energetic action, and take away tumours, and callous and even bony substances.

The judgment of the practitioner will decide when the desired effect will be best produced by a sudden and violent action, or by the continuance of one of a milder nature. Inflammation should be met by active blisters; old enlargements and swellings will be most certainly removed by milder stimulants—by the process which farriers call *sweating down*.

There is no better blister ointment or active blister than the Spanish fly, mixed with the proportions of lard and resin already mentioned. The best liquid or sweating blister is an infusion of the fly in turpentine, and that lowered with neat's foot oil according to the degree of activity required.

In preparing the horse for blistering, the hair should be clipped or shaved as closely as possible, and the ointment thoroughly rubbed in. Much fault is often found with the ointment if the blister does not rise, when the real blame should be attributed to the idleness of the operator.

The head of the horse must be tied up for the first two days; except that, when the sides are blistered, the body clothes may be so contrived as to prevent the horse from nibbling and blemishing the part, or blistering his muzzle. At the expiration of twenty-four hours, a little olive or neat's foot oil may be applied over the blister, which will considerably lessen the pain and supple the part, and prevent cracks in the skin that may be difficult to heal. The oil should be applied morning and night, until the scabs peel off. When they begin to loosen, a lather of soap and water applied with a sponge may hasten their removal, but no violence must be used.

Every particle of litter should be carefully removed from the stall, for the sharp ends of the straw coming in contact with a part rendered so tender and irritable by the blister, will cause very great annoyance to the animal. After the second day the horse may be suffered to lie down; but still the possibility of blemishing himself should be prevented by a *cradle* or wooden necklace, consisting of round strips of wood, strung together, reaching from the lower jaw to the chest, and preventing the horse from sufficiently turning or bending his head to get at the blistered part.

A blister thus treated will rarely produce the slightest blemish. When the scabs are all removed, the blister may be repeated, if the case should appear to require it, or the horse may be turned out.

In inflammations which threaten life, a blister can scarcely be too active or too extensive. In inflammation of the lungs it should reach over the whole of the sides, and the greater part of the brisket; for, should a portion of the fly be absorbed, and produce *strangury* (inflammation, or spasmodic affection of the neck of the bladder,) even this new irritation may assist in subduing the first and more dangerous one; but in blistering for injuries or diseases of the legs or feet some caution is necessary. When speaking of the treatment of sprain of the back sinews, we stated, that 'a blister should never be used while any heat or tenderness remains about the part,' for we should then add to the superficial inflammation, instead of abating the deeper seated one; and enlargements of the limb and ulcerations might follow, which would render the horse perfectly unserviceable. When there is a tendency to grease, a blister is a dangerous thing, and has often aggravated the disease. In winter, the inflammation of the skin produced by blistering is apt to degenerate into grease; therefore, if it should be necessary to blister the horse during that season, great care must be taken that he is not exposed to cold, and, particularly, that a current of cold air does not come upon the legs.

The inhuman practice of blistering *all round*, and perhaps high on the leg at the same time, cannot be too strongly reprobated. Many a valuable horse has been lost through the excessive general irritation which this has produced, or its violent effect on the urinary organs; and this has been particularly the case, when corrosive sublimate has entered into the composition of the blister.

If strangury should appear, the horse should be plentifully supplied with linseed tea, which is thus best prepared—a gallon of boiling water is poured on half a pound of linseed; the infusion suffered to stand till nearly cold, and the clean mucilaginous fluid then poured off. Three-quarters of a pound of Epsom salts should also be given, dissolved in a quart of water, and, after that, a ball every six hours, composed of a scruple of opium, and a drachm of camphor, with linseed meal and treacle.

Half a pound or a pound of good mustard powder, made into a paste with boiling water, and applied hot, will often produce as good a blister as cantharides, with far more swelling. It is a preferable one, where, as in inflammation of the kidneys, the effect of cantharides on the urinary organs is feared. Hartshorn is not so effectual. Tincture of croton makes an active liquid blister.

FIRING.

Whatever seeming cruelty may attend this operation, it is in many cases indispensable. The principle on which we have recourse to it is similar to that which justifies the use of a blister; by producing superficial inflammation we may be enabled to remove a deeper seated one, or we may excite the absorbents to take away any unnatural bony or other tumour: it has also this additional advantage, that,

while it raises intenser external inflammation than we can produce by other means, it is the most powerful agent that we have at our disposal. Humanity, however, will dictate, that on account of the inflammation which it excites, and the pain which it inflicts, it should only be had recourse to when milder means have failed, except in those cases in which experience has taught us that milder means rarely succeed.

The part which is to be submitted to the operation is shaved, or the hair is cut from it as closely as possible with the trimming scissors. This is necessary to bring the iron into immediate contact with the skin, and likewise to prevent the smoke that will arise from the burned hair from obscuring the view of the operator. The horse must then be thrown. This is absolutely necessary for the safety both of the operator and the animal. The side line is applied in a shorter time, and so many hands are not wanted to cast the horse; but no person can fire accurately, or with the certainty of not penetrating the skin, except the horse is effectually secured by the hobbles; and although accidents have occurred in the act of throwing, yet many more have resulted to the operator, the assistants, or the horse, in a protracted operation like this, when the side-line only has been used.

The details of the operation belong to the veterinary surgeon. The grand points to be attended to are to have the edge of the iron round and smooth—the iron itself at, or rather below a red heat—to pass it more or less rapidly over the skin, and with slighter or greater pressure according to the degree of heat—to burn into the skin until the line produced by the iron is of a brown colour, rather light than dark, and, by all means, to avoid *penetrating* the skin. Leaving the additional cruelty of deep firing out of the question, we may depend on it that if the skin is burned through, inflammation, and ulceration, and sloughing will ensue, which will be with much difficulty combatted— which will unavoidably leave unnecessary blemish, and which have destroyed many valuable horses. It may happen, nevertheless, that by a sudden plunge of the animal the skin will be unavoidably cut through. The act of firing requires much skill and tact, and the practitioner cannot be always on his guard against the struggles of the tortured beast. It will, also, and not unfrequently occur, that the skin, partially divided, will separate in two or three days after the operation. This must not be attributed to any neglect or unskillfulness of the surgeon, and the ulceration thus produced will be slight and easily treated, compared with that caused by the actual burning through of the skin.

Some practitioners blister immediately after firing. As a general usage it is highly to be reprobated. It is wanton and useless cruelty; but it may be required in bony tumours of considerable extent, and long standing, and interfering materially with the action of the neighbouring joint. Spavin accompanied by much lameness, and ring-bone spreading round the coronet, and involving the side cartilages, or the pastern joint, may justify it. The inflammation is rendered more intense, and of considerably longer duration. In old affections of the

round-bone it may be admitted, but no excuse can be made for it in slighter cases of sprain or weakness, or staleness.

On the day after the operation, it will be prudent gently to rub some neat's foot oil, or lard over the lines. This will soften the skin, and render it less likely to separate or ulcerate; a bandage would add to the irritation of the part. Any cracks of the skin, or ulcerations that may ensue, must be treated with the calamine ointment already recommended.

It will be evident that there is an advantage derived from firing to which a blister can have no pretension. The skin, partially destroyed by the iron, is reinstated and healed, not merely by the formation of some new matter filling up the vacuity, but by the gradual drawing together and closing of the separated edges. The skin, therefore, is lessened in surface; it is tightened over the part, and it acts as a salutary and permanent bandage. Of the effect of pressure in removing enlargements of every kind, as well as giving strength to the part to which it is applied, we have repeatedly spoken; and it is far from being the least valuable effect of the operation of firing, that, by contracting the skin, it affords a salutary, equable, and permanent pressure. It was on this principle, but the practice cannot be defended, that colts which were not very strong on the legs, used to be fired round the fetlock, and along the back sinew, or over the hock, to brace and strengthen the parts. It is on the same principle that a racer, that has become stale and stiff, is sometimes fired and turned out. For whatever reason the horse is fired, he should, if practicable, be turned out, or soiled in a loose box, for three or four months at least. The full effect intended to result from the external irritation is not soon produced, and the benefit derived from pressure proceeds still more slowly. In the thickened and tender state of the skin, and the substance beneath, for some weeks after firing, a return to hard work would be likely to excite a new inflammation, and cause ever worse mischief than that which before existed.

Some weeks pass before the terrified parts begin to lessen, and they only who have had experience in these cases would imagine how long, with gentle voluntary exercise, the process of absorption is carried on. He, therefore, who would expect that much good should accrue from the operation of firing, must be content to give up his horse for three or four months; but if he will use him sooner, and a worse lameness should follow, let him blame his own impatience, and not the inefficiency of the means, or the want of skill in the surgeon.

The firing in every case should be either in longitudinal or parallel lines. On the back sinews, the fetlock, and the coronet, this is peculiarly requisite, for thus only will the skin contract so as to form the greatest and most equable pressure.

The practitioner may pride himself in the accuracy of his diamonds, lozenges and feathers, but plain straight lines, about half an inch from each other, will form the most advantageous mode of firing. The destroying deeply seated inflammation, by exciting violent inflam-

mation on the skin, is as well obtained; and common sense will determine, that in no way can the pressure which results from the contraction of the skin be so advantageously employed, to which we may add, that it often leaves not the slightest blemish.

SETONS

Are pieces of tape or cord, passed by means of an instrument resembling a large needle either through abscesses, or the base of ulcers with deep sinuses, or between the skin and the muscular or other substances beneath. They are retained there by the ends being tied together, or by a knot at each end. The tape is moved in the wound twice or thrice in the day, and occasionally wetted with spirit of turpentine, or some acrid liquid, in order to increase the inflammation which it produces, or the discharge which is intended to be established.

In abscesses, such as tumours in the withers or the poll, and when passed from the summit to the very bottom of the swelling, setons are highly useful, as discharging the fluid and suffering any fresh quantity of it that may be secreted to flow out; and, by the degree of inflammation which they excite on the inside of the tumour, stimulating it to throw out healthy granulations which gradually occupy and fill the hollow. In deep fistulous wounds they are indispensable, for except some orifice be made for the matter to flow from the bottom of the wound, it will continue to eat deeper into it, and the healing process can never be accomplished. On these accounts, a seton passed through the bottom of the ulcer in poll-evil and fistulous withers is of much benefit.

Setons are sometimes useful by promoting a discharge in the neighbourhood of an inflamed part, and thus diverting and carrying away a portion of the fluids which overload, or would otherwise more distend the vessels of that part: thus a seton is placed in the cheek with considerable advantage, when the eyes are inflamed; we confess, however, that we far prefer a rowel under the jaw.

With this view, and to excite a new and different inflammation in the neighbourhood of a part already inflamed, and especially so deeply seated and so difficult to be got at as the navicular-joint, a seton has occasionally been used with manifest benefit, but we must peremptorily object to the indiscriminate use of the frog-seton for almost every disease of the frog or the foot.

In inflammations of extensive organs, setons afford only feeble aid. Their action is too circumscribed. In inflammation of the chest or the intestines a rowel is preferable to a seton; and a blister is far better than either of them.

On the principle of exciting the absorbents to action for the removal of tumours, as spavin or splent, a blister is quicker in its action, and far more effectual than any seton; and firing is still more energetic. Many horses have been blemished for life by the seton being torn out, and ulcerations, difficult to heal, having been produced; while a week

after week has often passed on, and the owner has been deprived of the use of the animal, without the tumour, or the lameness which it caused, being in the least degree diminished.

CHAPTER XII.

PRINCIPLES OF BREEDING, CASTRATION, &c

Our observations must be of a general nature, and will be very simple; and the first axiom we would lay down is, that "like will produce like," that the progeny will inherit the qualities, or the mingled qualities, of the parents. We would refer to the subject of diseases, and again state our perfect conviction, that there is scarcely one by which either of the parents is affected that the foal will not inherit, or, at least, the predisposition to it: even the consequences of ill usage or hard work will descend to the progeny. We have had proof upon proof, that blindness, rearing, thick-wind, broken-wind, spavins, curls, ring-bones, and founder, have been bequeathed, both by the sire and the dam, to the offspring. It should likewise be recollected, that although these blemishes may not appear in the immediate progeny, they frequently will in the next generation. Hence the necessity of some knowledge of the parentage both of the sire and dam.

Peculiarity of form and constitution will also be inherited. This is a most important, but neglected consideration; for however desirable, or even perfect, may have been the conformation of the sire, every good point may be neutralized or lost by the defective form, or want of blood, of the mare. There are niceties in this, of which some breeders used to be aware, and they employed their knowledge to great advantage. When they were careful that the essential points should be good in both parents, and that some minor defect in either should be met, and got rid of, by excellence in that particular point in the other, the result was creditable to their judgment, and highly profitable. The unskilful or careless breeder will often so badly pair the animals, that the good points of each will be, in a manner, lost: the defects of both will be increased, and the produce will be far inferior to both sire and dam.

We would wish to impress it on the minds of breeders, that peculiarity of form and constitution are inherited from both parents; that the excellence of the mare is a point of quite as much importance as that of the horse; and that out of an imperfect mare, let the horse be as perfect as he may, a good foal will rarely be produced. All this is recognised, although poverty or carelessness have made the general breeder neglect or forget it.

It is strange that in our saddle-horses, and, to a great degree, our carriage-horses, this should be left to chance. The breeder seems to care little about the quality of the mare, and the progeny is comparatively of little worth. Experience, it is said, will make fools wise, but

experience will here be bought at a very dear rate, both as it regards the breeder and the community.

That the constitution and endurance of the horse are inherited, no farrier ever doubted. The qualities of the sire or the dam descend from generation to generation, and the excellencies or defects of certain horses are traced, and justly so, to some peculiarity in a far distant ancestor.

It may, perhaps, be justly affirmed, that there is more difficulty in selecting a good mare to breed from, than a good horse, because she should possess somewhat opposite qualities. Her carcass should be long, to give room for the growth of the foetus, and yet with this there should be compactness of form and shortness of leg.

As to the shape of the stallion, but little can be said. It must depend on that of the mare, and the kind of horse wished to be bred; but if there be one point which we should say is absolutely essential, it is this, "compactness" as much goodness and strength as possible condensed in a little space. If we are describing the reverse of the common race of stallions for coach-horses, the fault lies with the bad taste and judgment of the majority of breeders.

Next to compactness, the inclination of the shoulder will be regarded. A huge stallion, with upright shoulders, never got a capital hackney. From him the breeder can obtain nothing but a cart or dray-horse, and that, perhaps, spoiled by the opposite form of the mare. On the other hand, an upright shoulder is desirable, if not absolutely necessary, when a mere draught horse is required.

It is of no little importance, that the parents should be in full possession of their natural strength and powers. It is a common error, that because a mare has once been good, she is fit for breeding when she is no longer capable of ordinary work. Her blood and perfect frame may ensure a foal of some value, but he will inherit a portion of the worn-out constitution of her from whom he sprung.

On the subject of *breeding in and in*, that is, persevering in the same breed, and selecting the best on either side, much has been said. The system of crossing requires much judgment and experience; a great deal more, indeed, than breeders usually possess. The bad qualities of the cross are too soon engrafted on the original stock, and once engrafted they are not, for many generations, eradicated. The good ones of both are occasionally neutralized to a most mortifying degree. On the other hand, it is the fact, however some may deny it, that strict confinement to one breed, however valuable or perfect, produces gradual deterioration. The truth here, as in many other cases, lies in the middle; crossing should be attempted with great caution, and the most perfect of the same *breed* should be selected, but varied, by being frequently taken from different stocks. This is the secret of the course.

A mare is capable of breeding at three or four years old; some have injudiciously commenced at two years, before her form or her strength is sufficiently developed, and with the developement of which this early

breeding will materially interfere. If she does little more than farm work, she may continue to be bred from until she is nearly twenty; but if she has been hardly worked, and bears the marks of it, let her have been what she will in her youth, she will deceive the expectations of the breeder in her old age.

The mare comes into heat in the early part of the spring. She is said to go with foal eleven months, but there is sometimes a strange irregularity about this. Some have been known to foal five weeks earlier, while the time of others has been extended six weeks beyond the eleven months. We may, however, take eleven months as the average time. In running-horses, that are brought so early to the starting-post, and whether they are foaled early in January or late in April, rank as of the same age, it is of importance that the mare should go to cover as early as possible: in a two or three-year-old, four months would make considerable difference in the growth and strength; yet many of these early foals are almost worthless, because they have been deprived of that additional nutriment which nature designed for them. For other breeds, the beginning of May is the most convenient period. The mare would then foal in the early part of April, when there would begin to be sufficient food for her and her colt, without confining them to the stable.

From the time of covering to that of foaling, the mare may be kept at moderate work, and that not only without injury, but with decided advantage. The work may be continued up to the very time when she is expected to foal; and of which she will give at least a day's notice, by the adhesive matter that will appear about the teats. When this is seen, it will be prudent to release her from work, and keep her near home, and under the frequent inspection of some careful person.

When nearly half the time of pregnancy has elapsed, the mare should have a little better food. She should be allowed one or two feeds of corn in the day. This is about the period when they are accustomed to slink their foals, or when abortion occurs: at this time, therefore, the eye of the owner should be frequently upon them. Good feeding and moderate exercise will be the best preventive against this. The mare that has once slinked her foal is ever liable to the same accident, and therefore should never be suffered to be with other mares about the time that this usually occurs, which is between the fourth and fifth months; for such is the power of imagination or of sympathy in the mare, that if one of them suffers abortion, the greater number of those in the same pasture will share the same fate. Farmers wash, paint, and tar their stables to prevent some supposed infection:—the infection lies in the imagination.

If a mare has been regularly exercised, and apparently in health while she was in foal, little danger will attend the act of parturition. If there be false presentation of the foetus, or difficulty in producing it, it will be better to have recourse to a well-informed practitioner, rather than injure the mother by the violent, and injurious attempts which are often made to relieve the animal.

As soon as the mare has foaled, she should be turned into some well-sheltered pasture, with a hovel or shed to run into when she pleases: and as, supposing she has foaled in April, the grass is scanty, she should have a couple of feeds of corn daily. The breeder may depend upon it, that nothing is gained by starving the mother and stinting the foal at this time. It is the most important time in the life of the horse; and if, from false economy, his growth be arrested now, his puny form and want of endurance will ever afterwards testify the error that has been committed. The corn should be given in a trough on the ground, that the foal may partake of it with the mother. When the new grass is flush and plenty, the corn may be gradually discontinued.

Our work is intended, principally, for farmers: they well know that the mare may be put to moderate work again a month after the foaling. The foal is at first shut in the stable during the hours of work; but as soon as it acquires sufficient strength to toddle after the mare, and especially when she is at slow work, it will be better for the foal and the dam that they should be together. The work will contribute to the health of the mother; the foal will more frequently draw the milk, and thrive better; and will be hardy and tractable, and gradually familiarized with the objects among which it is afterwards to live. While the mother, however, is thus worked, she and the foal should be well fed; and two feeds of corn, at least, should be added to the green food which they get when turned out after their work, and at night. The mare will usually be found at heat at or before the expiration of a month from the time of foaling, when, if she be kept principally for breeding purposes, she may be put again to the horse.

In five or six months, according to the growth of the foal, it may be weaned. It should then be housed for three weeks or a month, or turned into some distant rick-yard. There can be no better place for the foal than the latter, as affording, and that without trouble, both food and shelter. The mother should be put to harder work, and have drier meat. A urine or a physic ball, will be useful if the milk should be troublesome, or if she should pine after her foal.

There is no principle of greater importance than the liberal feeding of the foal during the whole of his growth, and at this time in particular. Bruised oats and bran should form a considerable part of his daily provender. The farmer may be assured that money is well laid out which is expended on the liberal nourishment of the growing colt: while, however, he is well fed, he should not be rendered delicate by excess of care. A racing colt is sometimes stabled; but one that is destined to be a hackney, or an agricultural horse, should merely have a square rick, under the leeward side of which he may shelter himself, or a hovel, into which he may run at night. The process of breaking in should commence from the very period of weaning. The foal should be daily handled, partially dressed, accustomed to the halter, led about, and even tied up. The tractability, and good temper, and value of the horse, depend a great deal more upon this than

breeders are aware: this should be done as much as possible by the man by whom they are fed, and whose management of them should be always kind and gentle. There is no fault for which a breeder should so invariably discharge his servant as cruelty, or even harshness, towards the rising stock; for the principle on which their after usefulness is founded, is early attachment to, and confidence in man, and obedience, implicit obedience, resulting principally from these.

After the second winter, the work of breaking-in may commence in good earnest. He may first be bitted, and a bit carefully selected that will not hurt his mouth, and much smaller than those in common use; with this he may be suffered to amuse himself, and to play, and to champ for an hour, on a few successive days.

Having become a little tractable, portions of the harness may be put upon him, and, last of all, the blind winkers; and a few days afterwards he may go into the team. It would be better if there could be one before, and one behind him, beside the shaft horse.—Let there be first the mere empty wagon. Let nothing be done to him, except that he may have an occasional pat or kind word. The other horses will keep him moving, and in his place; and no great time will pass, sometimes not even the first day, before he will begin to pull with the rest; then the load may be gradually increased.

The agricultural horse is wanted to ride as well as to draw. Let his first lesson be given when he is in the team. Let his feeder, if possible, be first put upon him; he will be too much hampered by his harness, and by the other horses, to make much resistance; and, in the majority of cases, will quietly and at once submit. We need not repeat that no whip or spur should be used in giving the first lessons in riding.

When he begins a little to understand his business, backing, the most difficult part of his work, may be taught him; first to back well without any thing behind him, then with a light cart, and afterwards with some serious load; and taking the greatest care not seriously to hurt the mouth. If the first lesson causes much soreness of the gums, the colt will not readily submit to a second. If he has been rendered tractable before by kind usage, time and patience will do all that can be wished here. Some carters are in the habit of blinding the colt when teaching him to back: it may be necessary with the restive and obstinate one, and should be used only as a last resort.

The colt having been thus partially broken-in, the necessity of implicit obedience may be taught him, and that not by severity, but by firmness and steadiness; the voice will go a great way, but the whip or the spur is sometimes indispensable—not so cruelly applied as to excite the animal to resistance, but to convince him that we have the power to enforce submission. Few, we would almost say, no horses, are naturally vicious. It is cruel usage which has first provoked resistance; that resistance has been followed by greater severity, and the stubbornness of the animal has increased; open warfare has ensued, in which the man seldom gained an advantage, and the horse

was frequently rendered unserviceable. Correction may, or must be used, to enforce implicit obedience after the education has proceeded to a certain extent, but the early lessons should be inculcated with kindness alone. Young colts are sometimes very perverse; many days will occasionally pass before they will permit the bridle to be put on, or the saddle to be worn; one act of harshness will double or treble this time. Patience and kindness will, after a while, prevail. On some morning, of better humour than usual, the bridle will be put on, and the saddle will be worn; and this compliance being followed by kindness and soothing on the part of the breaker, and no inconvenience or pain being suffered by the animal, all resistance will be at an end.

The same principles will apply to the breaking-in of the horse for the road. The handling, and some portion of instruction, should commence from the time of weaning. The future tractability of the horse will much depend on this. At two years and a half, or three years, the regular process of breaking-in should come on. If it be delayed until the animal is four years old, his strength and obstinacy will be more difficult to overcome. We cannot much improve on the plan usually pursued by the breaker, except that there should be much more kindness and patience, and far less harshness and cruelty, than these persons are accustomed to exhibit, and a great deal more attention to the form and natural action of the horse. A headstall is put on the colt, and a cavesson (or apparatus to confine and pinch the nose) affixed to it, with long reins. He is first accustomed to the rein, then led round a ring on soft ground, and at length mounted and taught his paces. Next to preserving the temper and docility of the horse, there is nothing of so much importance as to teach him every pace, and every part of his duty, distinctly and thoroughly. Each must constitute a separate and sometimes long-continued lesson, and that taught by a man who will never suffer his passion to get the better of his discretion.

After the cavesson has been attached to the headstall, and the long rein put on, the first lesson is, to be quietly led about by the breaker; a steady boy following behind, by occasional threatening with the whip, but never by an actual blow, to keep the colt up. When the animal follows readily and quietly, he may be taken to the ring, and walked round, right and left, in a very small circle. Care should be taken to teach him this pace thoroughly, never suffering him to break into a trot. The boy with his whip may here again be necessary, but not a single blow should actually fall.

Becoming tolerably perfect in the walk, he should be quickened to a trot, and kept steadily at it; the whip of the boy, if needful, urging him on, and the cavesson restraining him. These lessons should be short. The pace should be kept perfect and distinct in each; and docility and improvement rewarded with frequent caresses, and handfuls of corn. The length of the rein may now be gradually increased, and the pace quickened, and the time extended, until the animal

becomes tractable in this his first lessons, towards the conclusion of which, crupper-straps, or something similar, may be attached to the clothing. These, playing about the sides and flanks, accustom him to the flapping of the coat of the rider. The annoyance which they occasion will pass over in a day or two; for when the animal finds that no harm comes to him on account of these straps, he will cease to regard them.

Next comes the biting. The bit should be large and smooth, and the reins should be buckled to a ring on either side of the pad. There are many curious and expensive machines for this purpose, but the simple rein will be quite sufficient. The reins should at first be slack, and very gradually tightened. This will prepare for the more perfect manner in which the head will be afterwards got into its proper position, when the colt is accustomed to the saddle. Occasionally the breaker should stand in front of the colt, and take hold of each side rein near to the mouth, and press upon it, and thus begin to teach him to stop and to back at the pressure of the rein, rewarding every act of docility, and not being too eager to punish occasional carelessness or waywardness.

The colt may now be taken into the road or street to be gradually accustomed to the objects among which his services will be required. Here, from fear or playfulness, a considerable degree of starting and shying may be exhibited. As little notice as possible should be taken of it. The same or a similar object should be soon passed again, but at a greater distance. If the colt still shies, let the distance be farther increased, until he takes no notice of the object; then he may be gradually brought nearer to it, and this will be usually effected without the slightest difficulty: whereas, had there been an attempt to force the animal close to it in the first instance, the remembrance of the contest would have been associated with the object, and the habit of shying would have been established.

Hitherto, with a cool and patient breaker, the whip may have been shown, but will scarcely have been used; the colt must now, however, be accustomed to this necessary instrument of authority. Let the breaker walk by the side of the animal, and throw his right arm over his back, holding the reins in his left; and occasionally quicken his pace, and, at the moment of doing this, tap the horse with the whip in his right hand, and at first very gently. The tap of the whip and the quickening of the pace will soon become associated together in the mind of the animal. If necessary, the taps may gradually fall a little heavier, and the feeling of pain be the monitor of the necessity of increased exertion. The lessons of reining in and stopping, and backing on the pressure of the bit, may continue to be practised at the same time.

He may now be taught to bear the saddle. Some little caution will be necessary at the first putting of it on. The breaker should stand at the head of the colt, patting him, and engaging his attention, while one assistant, on the off side, gently places the saddle on the back of

the animal; and another, on the near side, slowly tightens the girths. If he submits quietly to this, as he generally will, when the previous process of breaking-in has been properly conducted, the ceremony of mounting may be attempted on the following or on the third day. The breaker will need two assistants to accomplish this operation. He will remain at the head of the colt, patting and making much of him. The rider will put his foot into the stirrup, and bear a little weight upon it, while the man on the off-side presses equally on the other stirrup-leather; and, according to the docility of the animal, he will gradually increase the weight, until he balances himself on the stirrup. If the colt be uneasy or fearful, he should be spoken kindly to and patted, or a mouthful of corn be given to him: but if he offers serious resistance, the lessons must terminate for that day; he may probably be in better humour on the morrow.

When the rider has balanced himself for a minute or two, he may gently throw his leg over, and quietly seat himself in the saddle. The breaker will then lead the animal round the ring, the rider sitting perfectly still. After a few minutes he will take the reins, and handle them as gently as possible, and guide the horse by the pressure of them; patting him frequently, and especially when he thinks of dismounting,—and after having dismounted, offering him a little corn or green meat. The use of the rein in checking him, and of the pressure of the leg, and the touch of the heel in quickening his pace, will soon be taught, and the education will be nearly completed.

The horse having thus far submitted himself to the breaker, these patings and rewards must be gradually diminished, and implicit obedience mildly but firmly enforced. Severity will not often be necessary; in the great majority of cases it will be altogether uncalled for: but should the animal, in a moment of waywardness, dispute the command of the breaker, he must at once be taught that he is the slave of man, and that we have the power, by other means, than those of kindness, to bend him to our will. The education of the horse is that of the child. Pleasure is, as much as possible, associated with the early lessons; but firmness, or, if need be, coercion, must confirm the habit of obedience. Tyranny and cruelty will, more speedily in the horse than even in the child, provoke the wish to disobey; and, on every practicable occasion, the resistance to command. The restive and vicious horse is, in ninety-nine cases out of a hundred, made so by ill-usage, and not by nature. None but those who will take the trouble to try the experiment are aware how absolute a command the due admixture of firmness and kindness will soon give us over any horse.

CASTRATION.

The period at which this important operation will be best performed depends much on the breed and form of the colt, and the purpose for which he is destined. For the common agricultural horse, the age of four or five months will be the most advisable, or, at least, before he is weaned. Very few horses are lost when castrated at that age. The

weather, however, should not be too hot, nor the flies too numerous. We enter our decided protest against the recommendation of some valuable, but incautious agricultural writers, that 'colts should be cut in the months of June or July, when flies pester the horses, and cause them to be continually moving about, and thereby prevent swelling.' One moment's reflection will convince the reader that nothing can be more likely to produce inflammation, and consequent swelling and danger, than the torture of the flies hovering around and stinging the sore part.

If the horse is designed either for the carriage or for heavy draught, the farmer should not think of castrating him until he be at least twelve months old; and, even then, the colt should be carefully examined. If he is thin and spare about the neck and shoulders, and low in the withers, he will materially improve by remaining uncut another six months; but if his fore-quarters are fairly developed at the age of a twelve month, the operation should not be delayed, lest he become heavy and gross before, and perhaps have begun too decidedly to have a will of his own. No specific age, then, can be fixed; but the castration should be performed rather late in the spring or early in the autumn, when the air is temperate, and particularly when the weather is dry. No preparation is necessary for the sucking colt, but it may be prudent to bleed and to physic one of more advanced age. In the majority of cases, no after treatment will be necessary, except that the animal should be sheltered from intense heat, and more particularly from wet. In temperate weather he will do much better running in the field than nursed in a close and hot stable. The moderate exercise which he will take in grazing will be preferable to perfect inaction.

The manner in which the operation is performed will be properly left to the veterinary surgeon; although we must confess that we are disposed to adhere to the old way of opening the bag on either side, cutting off the testicle, and preventing bleeding by searing the vessels with a hot iron. There is at least an appearance of brutality, and, we believe, much unnecessary pain inflicted, when the spermatic cord (the vessels and the nerve) is tightly compressed between two pieces of wood, as in a powerful vice, and left there either until the testicle drops off, or is removed on the following day by the operator. To the practice of some farmers, of *twitching* their colts at an early period, sometimes even so early as a month, we have stronger objections. When the operation of twitching is performed, a small cord is drawn as tightly as possible round the bag, between the testicle and the belly, the circulation is thus stopped, and, in a few days, the testicles and the bag drop off: but the animal suffers sadly,—it is occasionally necessary to tighten the cord on the second or third day, and inflammation and death have frequently ensued.

CHAPTER XIII. DIRECTIONS FOR SHOEING.

The period when the shoe began to be nailed to the foot of the horse is uncertain.

We have seen, in the progress of our inquiry, that while it affords to the foot of the horse that defence which seems now to be necessary, it has entailed on the animal some evils. It has limited or destroyed the beautiful expansibility of the lower part of the foot; it has led to contraction, although that contraction has not always been accompanied by lameness; in the most careful fixing of the best shoe, and in the careless manufacture and setting on of the bad one, much injury has often been done to the horse; yet, as we have already stated, to nothing like the extent which some have fancied or feared.

THE CONCAVE-SEATED SHOE.

The proper form and construction of the shoe is a subject deserving of very serious inquiry, for it is most important to ascertain the kind of shoe that will do the least mischief to the feet.

The concave-seated shoe presents a perfectly flat surface to the ground, to give as many points of bearing as possible, except that, round the outer edge, there is a groove or *fuller*, in which the nail holes are punched, so that, sinking into the fuller, their heads project but a little way above, and are soon worn down level with the shoe. The ground surface of the common shoe is somewhat convex, and the inward rim comes first on the ground: the consequence of this is, that the weight, instead of being borne fairly on the crust, is supported by the nails and the clencher, which must be injurious to the crust, and often chip and tear it.

The web of the shoe is of the same thickness throughout, from the toe to the heel; and it is sufficiently wide to guard the sole from bruises, and as wide at the heel as the frog will permit, in order to cover the seat of corn.

On the foot side it is *seated*. The outer part of it is accurately flat, and of the width of the crust, and designed to support the crust, and the crust only, for it has already been proved that by the crust alone, or rather by the union between the numerous little plates proceeding from the crust and the covering of the coffin-bone, the whole weight of the horse is supported. Towards the heel this flattened part is wider and occupies the whole breadth of the web, to support the heel of the crust and its reflected part the bar: thus while it defends the horn included within this angle from injury, it gives that equal pressure upon the bar and the crust, which is the best preventive against corn, and a powerful obstacle to contraction.

It is fastened to the foot by nine nails, five on the outside, and four on the inner side of the shoe; those on the outside extending a little farther down towards the heel, because the outside heel is thicker and

stronger, and there is more nail-hold; the last nail on the inner quarter being farther from the heel on account of the weakness of that quarter. For feet not too large, and where moderate work only is required from the horse, four nails on the outside, and three on the inside, will be sufficient; and the last nail being far from the heels, will allow more expansion there.

The inside part of the web is bevelled off, or rendered concave, that it may not press upon the sole. The concave shoe prevents the possibility of injury, because the sole can never descend in the degree in which the shoe is bevelled. A shoe bevelled still further is necessary to protect the projecting or pumiced foot.

While the horse is travelling, dirt and gravel are apt to insinuate themselves between the web of the shoe and the sole. If the shoe were flat they would be easily retained there, and would bruise the sole and be productive of injury; but when the shoe is thus bevelled off, it is scarcely possible for them to remain. They must be shaken out every time the foot comes in contact with the ground.

The web of the shoe is likewise of that thickness, that when the foot is properly pared, the prominent part of the frog shall lie just within and above its ground surface, so that in the descent of the sole the frog shall come sufficiently on the ground, to enable it to act as a wedge, and to expand the quarters, while it is defended from the wear and injury it would receive if it came on the ground with the first and full shock of the weight.

The nail holes are, on the ground side, placed as near the outer edge of the shoe as they can safely be, and brought out near the inner edge of the seating. The nails thus take a direction inward, resembling the direction of the crust itself, and take firmer hold; while the strain upon them in the common shoe is altogether prevented; and, the weight of the horse being thrown on a flat surface, contraction is not so likely to be produced.

THE PREPARATION OF THE FOOT.

We will suppose that the horse is sent to the shop to be shod. If the master would occasionally accompany him there, he would find it much to his advantage. The old shoe must be first taken off. We have something to observe even on this. It was retained on the foot by the ends of the nails being twisted off, turned down, and clenched. These clenches should be first raised, which the smith seldom takes the trouble thoroughly to do: but after going carelessly round the crust and raising one or two of the clenches, he takes hold first of one heel of the shoe, and then of the other, and by a violent wrench separates them from the foot, and by a third wrench, applied to the middle of the shoe, he tears it off. By this means he must enlarge every nail hole, and weaken the future hold, and sometimes tear off portions of the crust, and otherwise injure the foot. The horse generally shows by his flinching that he suffers by the violence with which this preliminary operation is performed. The clenches should always be raised

or filed off; and where the foot is tender, or the horse is to be examined for lameness, each nail should be partly punched out. Many a stub is left in the crust, the source of future annoyance, when this unnecessary violence is used.

The shoe having been removed, the smith proceeds to rasp the edges of the crust. Let not the stander-by object to the apparent violence which he uses, or fear that the foot will suffer. It is the only means he has, with safety to his instruments, to detect whether any stubs remain in the nail-holes; and it is the most convenient method of removing that portion of the crust into which dirt and gravel have insinuated themselves.

Next comes the important process of paring out, with regard to which it is almost impossible to lay down any specific rules. This, however, we can say with confidence, that more injury has been done by the neglect of paring, than by carrying it to too great an extent. The act of paring is a work of much more labour than the proprietor of the horse often imagines; the smith, except he be overlooked, will give himself as little trouble about it as he can; and that, which in the unshod foot, would be worn away by contact with the ground, is suffered to accumulate month after month, until the elasticity of the sole is destroyed, and it can no longer descend, and the functions of the foot are impeded, and foundation is laid for corn, contraction, navicular disease, and inflammation. That portion of horn should be left on the sole, which will defend the internal parts from being bruised, and yet suffer the external sole to descend.

If the foot has been previously neglected, and the horn is become very hard, the owner must not object if the smith resorts to some means to soften it a little; and if he takes one of his flat irons, and having heated it, draws it over the sole, and keeps it a little while in contact with it. When the sole is thick, this rude and apparently barbarous method can do no harm, but it should never be permitted with the sole that is regularly pared out.

The quantity of horn to be removed in order to leave the proper degree of thickness will vary with different feet. From the strong foot a great deal must be taken. From the concave foot the horn may be removed until the sole will yield to a moderate pressure. From the flat foot little need be pared; while the pumiced foot will spare nothing but the ragged parts.

The paring being nearly completed, the knife and the rasp of the smith must be a little watched, or he will reduce the crust to a level with the sole, and thus endanger the bruising of the sole by its pressure on the edge of the seating. The crust should be reduced to a perfect level, all round, but left a little higher than the sole.

The heels will require very considerable attention. From the stress which is thrown on the inner heel, and from the weakness of the quarter there, it usually wears considerably faster than the outer one; and, if an equal portion of horn were pared from it, it would be left lower than the outer heel. The smith should, therefore, accommodate

his paring to the comparative wear of the heels, and be very careful to leave them precisely level.

He should be checked in his almost universal fondness for opening the heels, or, more truly, removing that which is the main impediment to contraction. That portion of the heels between the inflection of the bar and the frog should scarcely be touched, at least nothing but the ragged and detached parts should be cut away. The foot may not look so pretty, but it will last longer without contraction.

The bar likewise should be left fully prominent, not only at its first inflection, but as it runs down the side of the frog. The heel of our shoe is designed to rest partly on the heel of the foot, and partly on the bar, for reasons that have been already stated. If the bar is weak, the growth of it should be encouraged, and it should be scarcely touched at the shoeing until it has attained a level with the crust.

The horn between the crust and the bar should be carefully pared out. Every horseman has observed the relief which is given to the animal lame with corns when this angle is well thinned; a relief, however, which is but temporary, for when the horn grows again and the shoe presses upon it, the torture of the animal is renewed.

The degree of paring to which the frog must be subjected will depend on its prominence, and on the shape of the foot. It must be left so far projecting and prominent, that it shall be just within and above the lower surface of the shoe, it will then descend with the sole, sufficiently to discharge the functions which we have attributed to it. If it be lower, it will be bruised and injured; if it be higher, it cannot come in contact with the ground, and thus be enabled to do its duty. The ragged parts must be removed, and especially those occasioned by thrush, but the degree of paring must depend entirely on this principle.

It appears, then, that the office of the smith requires some skill and judgment in order to be properly discharged; and the horse proprietor will find it his interest occasionally to visit the shop and complain of the careless, or idle, or obstinate, and reward, by some trifling gratuity, the expert and diligent. He should likewise remember that a great deal more depends on the paring out of the foot than on the construction of the shoe; that few shoes, except they press upon the sole, or are made outrageously bad, will lame the horse; but that he may be very easily lamed from ignorant and improper paring out of the foot.

THE PUTTING ON OF THE SHOE.

The foot being thus prepared, the smith looks about for a shoe. He should select one that as nearly as possible fits the foot, or may be altered to the foot. He will sometimes care little about this, for he can easily alter the foot to the shoe. The toe-knife is a very convenient instrument for him, and plenty of horn can be struck off with it, or removed by the rasp, to make the foot as small as the shoe; while he cares little, although by this destructive method the crust is materially thinned where it should receive the nail, and the danger of

puncture is increased, and the danger of pressure upon the sole is increased, and a foot so artificially diminished in size will soon grow over the shoe, to the hazard of considerable or permanent lameness.

A shoe, thinner at the heel than at the toe, by letting down the heel too low, is apt to produce sprain of the flexor tendon, and a shoe thicker at the heels than at the toe is fit only to elevate the frog, to the destruction of its function, and to its own certain disease, and also to press upon, batter and bruise that part of the foot which is soonest and most destructively injured.

CALKINS.

It is expedient not only that the foot and ground surface of the shoe should be most accurately level, but that the crust should be exactly smoothed and fitted to the shoe. Much skill and time are necessary to do this perfectly with the drawing knife. The smith has adopted a method of more quickly and more accurately adapting the shoe to the foot. He pares the crust as level as he can, and then he takes the shoe, at a heat something below a red heat, and applies it to the foot, and detects any little elevations by the deeper colour of the burned horn. This practice has been much inveighed against; but it is the abuse and not the use of the thing which is to be condemned. If the shoe be not too hot, nor held too long on the foot, an accuracy of adjustment is thus obtained, which the knife would be long in producing, or would not produce at all. If, however, the shoe is made to burn its way to its seat with little or no previous preparation of the foot, the heat must be injurious both to the sensible and insensible parts of the foot.

Nothing is more certain, than that in the horse for work, the heels, and particularly the seat of corn, can scarcely be too well covered. Part of the shoe projecting outward can be of no possible good, but rather an occasional source of mischief, and especially in a heavy country. A shoe, the web of which projects inward as far as it can, without touching the frog, affords protection to the angle between the bars and the crust.

Of the manner of attaching the shoe to the foot the owner can scarcely be a competent judge; he can only take care that the shoe itself shall not be heavier than the work requires—that for work a little hard the shoe shall still be light, with a bit of steel welded into the toe—that the nails shall be as small, and as few, and as far from the heels, as may be consistent with the security of the shoe; and that, for light work at least, the shoe shall not be driven on so closely and firmly as is often done, nor the points of the nails be brought out so high up as is generally practised.

There are few cases in which the use of calkins (a turning up and elevation of the heel) can be admissible in the fore-feet, except in frosty weather, to prevent the slipping of the feet. If, however, calkins are used, let them be placed on both feet. If the outer heel only be raised with the calkin, as is too often the case, the weight cannot be thrown

evenly on the foot, and undue straining and injury of some part of the foot or of the leg must be the necessary consequences. Few things deserve more the attention of the horseman than this most absurd and injurious of all the practices of the smith. One quarter of an hour's walking, with one side of the shoe or boot raised considerably above the other, will painfully convince us of what the horse must suffer from this too common method of shoeing. If the horse be ridden far to cover, or galloped over much hard and flinty ground, he will inevitably suffer from this unequal distribution of the weight. If the calkin be put on the outer heel to prevent the horse from slipping, either the horn of that heel should be lowered to a corresponding degree, or the other heel of the shoe should be raised to the same level by a gradual thickening. Of the use of calkins in the hinder foot, we shall presently speak.

CLIPS.

These are portions of the upper edge of the shoe, hammered out, and turned up so as to embrace the lower part of the crust, and which is usually pared out a little to receive the clip. They are very useful, as more securely attaching the shoe to the foot, and relieving the crust from that stress upon the nails which would otherwise be injurious. A clip at the toe is almost necessary in every draught horse, and absolutely so in the horse of heavy draught, to prevent the shoe from being loosened or torn off by the stress which is thrown upon the toe in the act of drawing. A clip on the outside of each shoe at the beginning of the quarters will give security to it. Clips are likewise necessary on the shoes of all heavy horses, and of all others who are disposed to stamp, or violently paw with their feet, and thus incur the danger of displacing the shoe; but they are evils, in that they press upon the crust as it grows down, and should only be used when circumstances absolutely require them.

THE HINDER SHOE.

In forming the *hinder* shoes it should be remembered that the hind limbs are the principal instruments in progression, and that in every act of progression, except the walk, the toe is the point on which the whole frame of the animal turns, and from which it is propelled.—This part, then, should be strengthened as much as possible; and, therefore, the hinder shoes are made broader at the toe than the fore ones, and the toe of the foot, which is naturally broader than that of the fore-foot, is still further widened by rasping. Another good effect is produced by this, that the hinder foot being shortened, there is less danger of *overreaching* or *forging*, and especially if the shoe be wider on the foot surface than on the ground one; and thus the shoe is made to slope inward, and is a little within the toe of the crust.

The shape of the hinder foot is somewhat different from that of the fore foot; it is straighter in the quarters, and the shoe must have the same shape. For carriage and draught horses generally, calkins may

be put on the heels, because the animal will be thus enabled to dig his toe more firmly into the ground, and urge himself forward, and throw his weight into the collar with greater advantage. But the calkins must not be too high, and they must be of an equal height on each heel; otherwise, as has been stated with regard to the fore feet, the weight will not be fairly distributed over the foot, and some part of the foot or of the leg will materially suffer. The nails in the hinder shoe may be placed nearer to the heel than in the fore shoe, because, from the comparative little weight and concussion thrown on the hinder feet, there is not so much danger of contraction.

DIFFERENT KINDS OF SHOES.

The shoe will vary in substance and weight with the kind of foot, and the nature of the work. A weak foot should never wear a heavy shoe, nor any foot a shoe that will last longer than a month. Here perhaps, we may be permitted to caution the horse-proprietor against having his cattle shod too much by contract, unless he binds his hostler to remove the shoes once at least in every month; for if the contractor, by a heavy shoe, and a little steel, can cause five or six weeks to intervene between the shoeings, he will do so, although the feet of the horse must necessarily suffer. The shoe should never be heavier than the work requires. An ounce or two in the weight of the shoe will sadly tell before the end of a hard day's work.

THE BAR-SHOE.

A bar-shoe is a very useful contrivance. It is the continuation of the common shoe round the heels, and by means of it the pressure may be taken off some tender part of the foot, and thrown on another which is better able to bear it, or more widely and equally diffused over the whole foot. It is principally resorted to in cases of corn, the seat of which it perfectly covers—in pumiced feet, the soles of which may be thus elevated above the ground and secured from pressure,—in sand-crack, when the pressure may be removed from the fissure and thrown on either side of it—in thrushes, when the frog is tender, or is become cankered, and requires to be frequently dressed, and the dressing can by this means alone be retained. In these cases the bar-shoe is an excellent contrivance, if worn only for one or two shoeings, or as long as the disease requires it to be worn, but it must be left off as soon as it can be dispensed with. If it be used for the protection of a diseased foot, however it may be chambered and laid off the frog, it will soon be flattened down upon it; or if the pressure of it be thrown on the frog to relieve the sand-crack or the corn, that frog must be very strong and healthy which can long bear the great and continued pressure. More mischief is often produced in the frog than previously existed in the part which was relieved. It will be plain that in the use of the bar-shoe for corn or sand-crack, the crust and the frog should be precisely on a level, and the bar should be the widest part of the shoe, to afford as extended bearing as possible on the frog, and

therefore less likely to be injurious. Bar-shoes are evidently not safe in frosty weather; they are never safe when much speed is required from the horse, and they are apt to be wrenched off in a heavy, clayey country.

TIPS.

Tips are short shoes, reaching only half round the foot, and worn while the horse is at grass to prevent the crust being torn by the occasional hardness of the ground, or by the pawing of the animal; and the quarters at the same time being free, the foot disposed to contract has a chance of expanding and regaining its natural shape.

THE EXPANDING SHOE.

Our subject would not be complete if we did not describe the supposed expanding shoe. It is either seated or concave like the common shoe, with a joint at the toe, by which the natural expansion of the foot is said to be permitted, and the injurious consequences of shoeing prevented. There, is however, this radical defect in the jointed shoe, that the nails occupy the same situation as in the common shoe, and prevent, as do the nails of the common shoe, the gradual expansion of the sides and quarters, and allow only of a hinge-like motion at the toe. This is a most imperfect accommodation of the expansion of the foot to the action of its internal parts, and even this accommodation is afforded in the slightest possible degree, or rather can scarcely be afforded at all. Either the nails fix the sides and quarters as in the common shoe, and then the joint at the toe is useless; or, if that joint merely opens like a hinge, the nail holes in the shoe can no longer correspond with those in the quarters which are unequally expanding at every point; and, therefore, there will be more stress on the crust at these holes, which will not only enlarge them and destroy the fixed attachment of the shoe to the hoof, but will often tear away portions of the crust. This has, in many cases, been found to be the effect of the jointed shoe: The sides and quarters of the foot have been broken until it has become difficult to find nail-hold. This shoe, to answer the intended purpose, should consist of many joints, running along the sides and quarters, which would make it too complicated and expensive and frail for general use.

While the shoe is to be attached to the foot by nails, we must be content with the concave-seated one, taking care to place the nail-holes as far from the heels, and particularly from the inner heel, as the state of the foot and the nature of the work will admit; and where the country is not too heavy nor the work too severe, even omitting the nails on the inner side of the foot. Shoes nailed on the outer side, and at the toe, are more secure than some would imagine, while the inner quarter will be left free, to prevent contraction, or to arrest its progress.

The attempt, however, to lessen the evils produced by shoeing is most praiseworthy. Every contrivance permanently to fix the shoe on the foot *without the use of nails* has failed.

FELT OR LEATHER SOLES.

When the foot is bruised or inflamed, the concussion or shock produced by the hard contact of the elastic iron on the ground gives the animal much pain, and causes a short and feeling step, or even lameness, and aggravates the injury or disease. A strip of felt or leather is sometimes placed between the seating of the shoe and the crust, which, from its want of elasticity, deadens or materially lessens the vibration or shock, and the horse treads more freely and is evidently relieved. This is a very good contrivance while the inflammation or tenderness of the foot continues, but a very bad practice if constantly adopted. The nails cannot be driven so surely or so securely when this substance is interposed between the shoe and the foot; the contraction and swelling of the felt or leather from the effect of moisture or dryness will soon render the attachment of the shoe less firm; there will be too much play upon the nails; the nail holes will enlarge, and the crust will be broken away.

After wounds or extensive bruises of the sole, or where the sole is thin and flat and tender, it is sometimes covered with a piece of leather, fitted to the sole, and nailed on with the shoe. This may be allowed as a temporary defence of the foot; but there is the same objection to its permanent use from the insecurity of fastening, the strain on the crust, and the frequent chipping of it: and there are these additional inconveniences, that if the hollow between the sole and the leather be filled with stopping and tow, it is exceedingly difficult to introduce them so evenly and accurately as not to produce some partial or injurious pressure—that a few days' work will almost invariably so derange the padding as to produce partial pressure—that the long contact of the sole with stopping of almost every kind, will produce, not a healthy, elastic horn, but horn of a scaly, spongy nature—and that if the hollow be not thus filled, gravel and dirt will insinuate themselves, and cause unequal pressure, and eat into and injure the foot.

WEAVING.

CHAPTER XIV.

THE GENERAL MANAGEMENT OF THE HORSE.

This is a most important subject, even as it regards the farmer, although there are comparatively few glaring errors in the treatment of the agricultural horse: but it comes more especially home to the gentleman, who is too often and too implicitly under the guidance of an idle, ignorant, and designing hostler.

We will arrange the most important points of general management under the following heads:

AIR.

A supply of pure air is necessary to the existence and health of man and beast. In some stables, the supply, if not too great, is carelessly and injudiciously admitted; for the wind blows in from every quarter, and beats directly upon the animal. When he has been well seasoned to this, it seems to do him little harm, except that he has an unthrifty coat, and is out of condition. The common error, however, is to exclude as much as possible every breath of air, and to have the atmosphere of the stable, hot, contaminated, and unwholesome. The effect of several horses being shut up in the same stable is to render the air unpleasantly hot. A person coming from without cannot breathe it many minutes without profuse perspiration. The horse stands hour after hour in it, and sometimes clothed; and then his covering is suddenly stripped off, and he is led into the open air, the temperature of which is thirty or forty degrees below that of the stable. Putting the humanity of the thing for a moment out of the question, we ask, must not the animal, thus unnaturally and absurdly treated, be subject to rheumatism, catarrh, and inflammation of the lungs? It has been replied, that the horse keeps himself warm by exercise while he is thus exposed, and that a man, using strong exertion, cares little about the quantity of clothing upon him. Is the horse constantly in motion after his blanket has been stripped from him, and he has been turned out naked, when the mercury in the thermometer is below the freezing point? Does he not often stand, hour after hour, in the road or the street, while his owner is warming himself within, and this perhaps after every pore has been opened by a brushing gallop; and his susceptibility to the painful and the injurious influence of cold has been excited to the utmost?

It is not so generally known as it ought to be, that the return to a hot stable is quite as dangerous as the change from a heated atmosphere to a cold and biting air. Many a horse, that has travelled without harm over a bleak country, has been suddenly seized with

inflammation and fever when he has, immediately at the end of his journey, been surrounded with heated and foul air. It is the sudden change of temperature, whether from heat to cold, or from cold to heat, that does the mischief, and yearly destroys a multitude of horses.

The stable should be as large, compared with the number of horses which it is destined to contain, as circumstances will allow.

If there is a loft above the stable, the ceiling should be rendered tight in order to prevent the foul air from penetrating to the hay above, and injuring both its taste and its wholesomeness; and no openings should be allowed above the racks, through which the hay may be thrown into them, for they also will permit the foul air to ascend to the provender, and, in the act of filling the rack, and while the horse is eagerly gazing upward for his food, many a grass-seed has fallen into his eye, and produced considerable inflammation.

A hot stable has, in the mind of the groom, been long connected with a glossy coat. The latter, it is thought, cannot be attained without the former. To this we should reply that, in winter, a thin, glossy coat is not desirable. Nature gives to every animal a warmer clothing when the cold weather approaches. The horse acquires a thicker and a lengthened coat, in order to defend him from the surrounding cold. Man puts on an additional and a warmer covering, and his comfort is increased and his health preserved by it. He who knows any thing of the horse, or cares any thing for his enjoyment, will not object to a coat a little longer and a little roughened, when the wintry wind blows bleak. The coat, however, need not be so long as to be unsightly; and warm clothing, even in a cool stable, will, with plenty of honest grooming, keep the hair sufficiently smooth and glossy to satisfy the most fastidious. The over-heated air of a close stable saves much of this grooming, and therefore the idle attendant unscrupulously sacrifices the health and safety of the horse.

If the stable is close, the air will not only be hot, but foul. The breathing of every animal contaminates it; and when, in the course of the night, with every aperture, even the key-hole, stopped, it passes again and again through the lungs, the blood cannot undergo its proper and healthy change; digestion cannot be so perfectly performed, and all the functions of life are injured. Let the owner of the valuable horse think of his passing twenty or twenty-two out of the twenty-four hours in this debilitating atmosphere. Nature does wonders in enabling every animal to accommodate itself to the situation in which it is placed, and the horse that lives in the stable-oven suffers less from it than would scarcely be conceived possible; but he does not, and cannot, possess the power and the hardihood which he would acquire under other circumstances.

The air of the improperly close stable is still further contaminated by the urine and dung, which rapidly ferment in the heat, and give out stimulating and unwholesome vapours. When a person first enters an ill-managed stable, and especially early in the morning, he is annoyed not only by the heat of the confined air, but by a pungent smell,

resembling hartshorn; and can he wonder at the inflammation of the eyes, and the chronic cough, and the inflammation of the lungs, with which the animal, who has been shut up in this vitiated atmosphere all night, is often attacked or if glanders and farcy should occasionally break out in such stables? It has been ascertained by chemical experiment, that the urine of the horse contains in it an exceedingly large quantity of hartshorn; and not only so, but that, influenced by the heat of a crowded stable, and possibly by other decompositions that are going forward at the same time, this ammonical vapour begins to be rapidly given out almost immediately after the urine is voided.

When disease begins to appear among the inhabitants of these ill-ventilated places, is it wonderful that it should rapidly spread among them, and that the plague-spot should be, as it were, placed on the door of such a stable? When distemper appears in spring or in autumn, it is in very many cases to be traced first of all to such a pest-house. It is peculiarly fatal there. The horses belonging to a small establishment, and rationally treated, have it comparatively seldom, or have it lightly; but, among the inmates of a crowded stable, it is sure to display itself, and there it is most of all fatal. The experience of every veterinary surgeon, and of every large proprietor of horses, will corroborate this statement. Agriculturists should bring to their stables the common sense which directs them in the usual concerns of life; and should begin, when their pleasures and their property are so much at stake, to assume that authority, and to enforce that obedience, to the lack of which is to be attributed the greater part of bad stable-management and horse-disease. Of nothing are we more certain, than that the majority of the maladies of the horse, and those of the worst and most fatal character, are directly or indirectly to be attributed to the unnatural heat of the stable, and the sudden change of the animal from a high to a low, or from a low to a high temperature.

LITTER.

Having spoken of the vapour of hartshorn, which is so rapidly and so plentifully given out from the urine of a horse in a heated stable, we take next into consideration the subject of litter. The first caution is frequently to remove it. The early extrication of gas shews the rapid putrefaction of the urine; and the consequence of which will be the rapid putrefaction of the litter that has been moistened by it. Every thing hastening to decomposition should be carefully removed where life and health are to be preserved. Every portion of the litter that has been much wetted, or at all softened by the urine, and is beginning to decay, should be swept away every morning. the greater part of the remainder may then be piled under the manger, a little being left to prevent the painful and injurious pressure of the feet during the day. The soiled and macerated portion of that which was left should be removed at night,

No heap of fermenting dung should be suffered to remain during the day in the corner or in any part of the stable. With regard to this, the directions of the master should be peremptory.

The stable should be so contrived that the urine shall quickly run off, and the offensive and injurious vapour from the decomposing urine and the litter will thus be materially lessened: if, however, the urine be carried away by means of a gutter running along the stable, the floor of the stalls must slant toward that gutter, and the declivity will sometimes be so great as to strain the back sinews, and become an occasional, although unsuspected cause of lameness. If the reader will stand for a few minutes with his toes higher than his heels, the pain he will feel in the calves of his legs will soon convince him of the truth of this remark. Hence, when a horse is not eating, he always endeavours to find his level, either by standing across the stall, or else as far back as his halter will permit, so that his hind legs may meet the ascent of the other side of the channel.

This direction of the stall is also a frequent cause of contraction of the heels of the foot, by throwing too great a proportion of the weight upon the toe, and removing that pressure on the heels which tends most to keep them open. Care therefore must be taken that the slanting of the floor of the stalls shall be no more than is sufficient to drain off the urine with tolerable rapidity. Stalls of this kind certainly do best for mares; but for horses we much prefer those with a grating in the centre, and an inclination of the floor on every side towards the middle. A short branch may communicate with a larger drain, by means of which the urine may be carried off to a reservoir outside the stable.

The farmer should not lose any of the urine. It is from the dung of the horse that he derives a principal and the most valuable part of his manure. It is that which earliest takes on the process of putrefaction, and forms one of the strongest and most durable dressings. That which is most of all concerned with the rapidity and the perfection of the decomposition, is the urine.

Humanity and interest, as well as the appearance of the stable, will induce the general proprietor of the horse to place a moderate quantity of litter under him during the day.

LIGHT.

This neglected branch of stable-management is of far more consequence than is generally imagined. To carriage horses and hackneys, so far at least as the eyes are concerned, a dark stable is little less injurious than a foul and heated one. To illustrate this, reference may be made to the unpleasant feeling and the utter impossibility of seeing distinctly, when a man suddenly emerges from a dark place into the full blaze of day. The sensation of mingled pain and giddiness is not soon forgotten; and some minutes pass before the eye can accommodate itself to the increased light. If this were to happen every day, or several times in the day, the sight would be irreparably

injured; or, possibly, blindness would ensue. Can we wonder, then, that the horse taken from a dark stable into a glare of light, and feeling, probably, as we should do under similar circumstances, and unable for a considerable time to see any thing around him distinctly, should become a starter, or that the frequently repeated violent effect of sudden light should induce inflammation of the eye, so intense as to terminate in blindness? There is, indeed, no doubt that horses kept in a dark stable are frequently notorious starters, and that starting has been evidently traced to this cause.

Farmers know, and should profit by the knowledge, that the darkness of the stable is not unfrequently a cover for great uncleanness. A glazed window, would not cost much, and would admit a degree of light somewhat more approaching to that of day; and, at the same time, would render the concealment of gross inattention and want of cleanliness impossible.

If plenty of light be admitted, the walls of the stable, and especially that portion of them which is before the horse's head, must not be of too glaring a colour. The constant reflection from a white wall, and especially if the sun shines into the stable, will be as injurious to the eye as the sudden changes from darkness to light. The perpetual slight excess of stimulus will do as much mischief as the occasional, but more violent one, when the animal is taken from a kind of twilight to the blaze of day. The colour of the stable, therefore, should depend on the quantity of light. Where much can be admitted the walls should be of a grey hue. Where darkness would otherwise prevail, frequent whitewashing may in some degree dissipate the gloom.

For another reason it will be evident that the stable should not possess too glaring a light. It is the resting place of the horse. The work of the farmer's horse, indeed, is confined principally to the day, but the labours of others are demanded at all periods. The hour of exertion having passed, the animal returns to his stable to feed and to repose, and the latter is as necessary as the former, in order to prepare him for renewed work. Something approaching to the dimness of twilight is requisite, to induce the animal to compose himself to sleep. This half-light more particularly suits horses of heavy work, and who draw almost as much by the weight of carcass which they can throw into the collar, as by the degree of muscular energy of which they are capable. In the quietness of a dimly-lighted stable they obtain repose, and accumulate flesh and fat. The circumstances, then, under which a stable somewhat darkened may be allowed, will be easily determined by the owner of the horse; but, as a general rule, dark stables are unfriendly to cleanliness, and the frequent cause of the vice of starting, and of the most serious diseases of the eyes.

GROOMING.

Of this much need not be said, since custom, and, apparently without ill effect, has allotted so little of the comb and the brush to the farmer's horse. The animal that is worked all day, and turned out at

night, requires little more to be done to him than to have the dirt brushed off his limbs. Regular grooming, by rendering his skin more sensible to the alteration of temperature, and the inclemency of the weather, would be prejudicial. The horse that is altogether turned out needs no grooming. The dandriff or scurf which accumulates at the roots of the hair is a provision of nature to defend him from the wind and the cold.

It is to the stabled horse, highly fed, and little or irregularly worked, that grooming is of so much consequence. Good rubbing with the brush or the currycomb *opens the pores of the skin*, and circulates the blood to the extremities of the body and through the minute vessels of the skin, and produces free and healthy perspiration, and stands in the room of exercise. No horse will carry a fine coat without either heat or dressing. They both effect the same purpose; they both increase the insensible perspiration: but the first does it at the expense of health and strength, while the second, at the same time that it produces a glow on the skin, and a determination of blood to it, rouses all the energies of the frame. It would be well for the proprietor of the horse if he were to insist upon it, and to see that his orders are really obeyed, that the fine coat in which he and his groom so much delight, is produced by honest rubbing, and not by a heated stable and thick clothing, and most of all, not by stimulating or injurious spices.

When the weather will permit the horse to be taken out, he should never be groomed in the stable. Without dwelling on the want of cleanliness, when the scurf and dust that are brushed from the horse lodge in his manger, and mingle with his food, experience teaches, that if the cold is not too great, the animal is braced and invigorated from being dressed in the open air, to a degree that cannot be attained in the stable. There is no necessity, however, for half the punishment which many a groom inflicts upon the horse in the act of dressing; and particularly on one whose skin is thin and sensible. The currycomb should at all times be lightly applied. With many horses its use may be almost dispensed with; and even the brush need not be so hard, nor the points of the bristles so irregular as they often are. A soft brush, with a little more weight of the hand, will be equally effectual, and a great deal more pleasant to the horse. A hair cloth, while it will seldom irritate and tease, will be almost sufficient with horses that have thin hair, and that have not been neglected.

Whoever would be convinced of the benefit of friction to the horse's skin, and to the horse generally, need only observe the effect produced by well hand-rubbing the legs of a tired horse. While every enlargement subsides, and the painful stiffness disappears, and the legs attain their natural warmth, and become fine, the animal is evidently and rapidly reviving; he attacks his food with appetite, and then quietly lies down to rest.

EXERCISE.

Our observations on this important branch of stable-management must have only slight reference to the agricultural horse. His work is usually regular and not exhausting. He is neither predisposed to disease by idleness, nor worn out by excessive exertion. He, like his master, has enough to do to keep him in health, and not enough to distress or injure him: on the contrary, the regularity of his work prolongs life to an extent rarely witnessed in the stable of the gentleman. Our remarks on exercise, then, must have a general bearing, or have principal reference to those persons who are in the middle stations of life, who contrive to keep a horse for business or pleasure, but cannot afford to maintain a servant for the express purpose of looking after it. The first rule we would lay down is, that every horse should have daily exercise. The horse that, with the usual stable feeding, stands idle for three or four days, as is the case in many establishments, must suffer. He is disposed to fever, or to grease, or, most of all, to diseases of the foot; and if, after these three or four days of inactivity, he is ridden fast and far, is almost sure to have inflammation of the lungs or of the feet.

A gentleman or tradesman's horse suffers a great deal more from idleness than he does from work. A stable-fed horse should have two hours' exercise every day, if he is to be kept free from disease.—Nothing of extraordinary or even of ordinary labour can be effected on the road or in the field without sufficient and regular exercise. It is this alone which can give energy to the system, or develope the powers of any animal.

How then is this exercise to be given? As much as possible by, or under the superintendence of, the owner. The exercise given by the groom is rarely to be depended upon. It is inefficient, or it is extreme. It is in many cases both irregular and injurious. It is dependent on the caprice of him who is performing a task, and who will render that task subservient to his own pleasure or purposes.

In training the race-horse regular exercise is the most important of all consideration: however it may be forgotten in the usual management of the stable. The exercised horse will discharge his task, and sometimes a severe one, with ease and pleasure, while the idle and neglected one will be fatigued ere half his labour be accomplished, and if he be pushed a little too far, dangerous inflammation will ensue. How often does it happen, that the horse that has stood inactive in the stable three or four days, is ridden or driven thirty or forty miles in the course of a single day? This rest is often purposely given to prepare for extra-exertion;—to lay in a stock of strength for the performance of the task required of him: and then the owner is surprised and dissatisfied if the animal is fairly overdone, or possibly becomes seriously ill.

Exercise should be somewhat proportioned to the age of the horse. A young horse requires more than an old one. Nature has given to

young animals of every kind a disposition to activity; but the exercise must not be violent. A great deal depends upon the manner in which it is given. To preserve the temper, and to promote health, it should be moderate, at least at the beginning and the termination. The rapid trot, or even the gallop, may be resorted to in the middle of the exercise, but the horse must be brought in cool. If the owner would seldom intrust his horse to boys, and would insist on the exercise being taken within sight, or in the neighborhood of his residence, many an accident and irreparable injury would be avoided. It should be the owner's pleasure, and is his interest, personally to attend to all these things. He manages every other part of his concerns, and he may depend on it, that he suffers when he neglects, or is in a manner excluded from his stables.

FOOD.

The system of manger-feeding is becoming general among farmers. There are few horses that do not habitually waste a portion of their hay; and by some the greater part is pulled down and trampled under foot, in order first to cull the sweetest and best locks, and which could not be done while the hay was inclosed in the rack. A good feeder will afterwards pick up much of that which was thrown down; but some of it must be soiled and rendered disgusting, and, in many cases, one third of this division of their food is wasted. Some of the oats are imperfectly chewed by all horses, and scarcely at all by hungry and greedy ones. The appearance of the dung will sufficiently evince this.

The observation of this induced the adoption of manger-feeding, or of mixing a portion of chaff (cut straw) with the grain. By this means the animal is compelled to chew his food; he cannot, to any great degree, bolt the straw or hay; and while he is forced to grind that down, the oats, or Indian corn are ground with it, and yields more nourishment; the stomach is more slowly filled, and therefore acts better on its contents, and is not so likely to be overloaded; and the increased quantity of saliva thrown out in the lengthened grinding of the food, softens it, and renders it more fit for digestion.

If, when considerable provender was wasted, the horse maintained his condition, and was able to do his work, it was evident that much might be saved to the farmer, when he adopted a system by which the horse ate all that was set before him; and by degrees it was found out that even food somewhat less nutritious, but a great deal cheaper, and which the horse either would not eat, or would not properly grind down, in its natural state, might be added, while the animal would be in quite as good plight, and always ready for work.

Chaff may be composed of equal quantities of hay, and wheaten, oaten, or barley straw, cut into pieces of a quarter or half an inch in length, and mingled well together; the allowance of oats or Indian corn is afterwards added, and mixed with the chaff. Many farmers very properly bruise the grain. The whole oat is apt to slip out of

the chaff and be lost; but when it is bruised, and especially if the chaff is a little wetted, it will not readily separate; or, should a portion of it escape the grinders, it will be partly prepared for digestion by the act of bruising. The prejudice against bruising the oats is, so far as the farmer's horse, and the wagon horse, and every horse of slow draught is concerned, altogether unfounded. The quantity of straw in the chaff will always counteract any supposed purgative quality in the bruised oats. Horses of quicker draught, except they are naturally disposed to scour, will thrive better with bruised than with whole oats, for a greater quantity of nutriment will be extracted from the food, and it will always be easy to apportion the quantity of straw to the effect of the mixture on the bowels of the horse. The principal alteration that should be made in the horse of harder and more rapid work, such as the stage-horse, is to increase the quantity of hay, and diminish that of straw.

Horses are very fond of this provender. The majority of them, after having been accustomed to it, will leave the best oats given to them alone, for the sake of the mingled chaff and grain. We would, however, caution the farmer not to set apart too much damaged hay for the manufacture of the chaff. The horse may be thus induced to eat that which he would otherwise refuse; but if the nourishing property of the hay has been impaired, or it has acquired an injurious principle, the horse will either lose condition, or become diseased. More injury is done by the eating of damaged hay or musty oats than is generally imagined. There will be sufficient saving in the diminished cost of the provender by the introduction of the straw, and in the improved condition of the horse, without poisoning him with the refuse of the farm.

While the mixture of chaff with the corn prevents the corn from being too rapidly devoured, and a portion of it swallowed whole, and therefore the stomach is not too loaded with that on which, as containing the most nutriment, its chief digestive power should be exerted, yet, on the whole, a great deal of time is gained by this mode of feeding, and more is left for rest. When a horse comes in wearied at the close of the day, it occupies, after he has eaten his corn, two or three hours to clear his rack. On the system of manger-feeding, the chaff being already cut into small pieces, and the oats bruised, he is able fully to satisfy his appetite in an hour and a half. Two additional hours are therefore devoted to rest. This is a circumstance deserving of much consideration even in the farmer's stable, and of immense consequence to the stage-coach proprietor, and the owner of every hard-worked horse.

The farmer's horse is sometimes fed on hay or grass alone, and the animal, although he rarely gets a feed of corn, maintains himself in tolerable condition, and does the work that is required of him; but hay and grass alone, however good in quality, or in whatever quantity administered, will not support the horse under hard work; and therefore other substances, containing a larger proportion of nutriment in

a smaller compass, have been added. We will briefly enumerate them, and consider their comparative value. The Oat has been selected as that portion of the food which is to afford the principal nourishment. It contains seven hundred and forty-three parts out of a thousand of nutritive matter. The oat should be old, heavy, dry, and sweet. The new oat will weigh ten or fifteen per cent. more than the old oat; but the difference consists principally in watery matter, which is gradually evaporated. The new oat is not so readily ground down by the teeth as the old one, and forms a more glutinous mass, difficult to digest, and, when eaten in considerable quantities, is apt to occasion colic and even staggers. The old oat forms, when chewed, a smooth and uniform mass, which readily dissolves in the stomach, and yields the nourishment which it contains, and perhaps some chemical change may have been slowly effected in the old oat, disposing it to be more readily assimilated. Oats should be plump, bright in color, and free from unpleasant smell or taste. The musty smell of wetted or damaged corn is caused by a fungus which grows upon the seed, and which has an injurious effect on the urinary organs, and often on the intestines, producing profuse staling, inflammation of the kidney or colic, and inflammation of the bowels.

This musty smell is removed by kiln-drying the oat, but care is here requisite that too great a degree of heat is not employed. It should be sufficient to destroy the fungus without injuring the life of the seed. The kiln-burnt oat, however, is not so grateful to the animal: it acquires a heating quality—causes increased discharge of urine, and not unfrequently produces inflammation of the eyes, and mangy affections of the skin.

Oats in the chaff have been recommended. An improvement would be effected, by cutting the unthreshed oat straw into chaff. The expense of threshing would be saved. Oat straw is better than barley straw, but does not contain so much nourishment as that of wheat.

When the horse is fed on hay and oats, the quantity of the oats must vary with his size and the work to be performed. In winter, four feeds, or nine or ten pounds of oats a day, will be a fair allowance for a horse of fifteen hands one or two inches high, and that has moderate work. In summer, half the quantity, with green food, will be sufficient.

Oatmeal, in the form of gruel constitutes one of the most important articles of diet for the sick horse—not indeed forced upon him, but a pail containing it being slung in his box, and of which he will soon begin to drink when water is denied. In cases of poisoning, or of over purging, it is useful whether administered by the mouth, or as an injection.

White-water, made by stirring a pint of oatmeal into a pail of water, the chill being taken from it, is an excellent beverage for the thirsty and tired horse.

BARLEY is a common food of the horse in various parts of England, and, until the introduction of the oat, seems to have constituted almost his only food. It is more nutritious than oats, containing nine hundred and twenty parts of nutritive matter in every thousand. There seems, however, to be something necessary besides a great proportion of nutritive matter, in order to render any substance wholesome, strengthening, or fattening. Except where horses are very hardly worked, barley does not seem in our country to agree with them so well as oats. They are more subject to inflammatory complaints, and particularly to surfeit and mange. When barley is given, the quantity should not exceed a peck daily. It should be always bruised, and the chaff should consist of equal quantities of hay and barley straw, and not cut too short. If the farmer has a quantity of spotted or unsaleable barley which he wishes thus to get rid of, he must very gradually accustom his horses to it, or he will probably produce serious illness among them. For horses that are recovering from illness, barley, in the form of malt, is often serviceable, as tempting the appetite and recruiting the strength. It is best given in mashes; water, considerably below the boiling heat, being poured upon it, and the vessel or pail kept covered for half an hour.

Grains, fresh from the mash-tub, either alone, or mixed with oats or chaff, or both, may be occasionally given to horses of slow work; they would, however, afford very insufficient nourishment for horses of quicker or harder work.

WHEAT is more rarely given than barley. It contains nine hundred and fifty-five parts of nutritive matter. When farmers have a damaged or unmarketable sample of wheat, they sometimes give it to their horses, and, being at first used in small quantities, the horse becomes accustomed to it, and thrives and works well. It must, however, always be bruised and given in chaff. Wheat contains a greater proportion of *gluten*, or sticky adhesive matter, than any other kind of grain; it is difficult of digestion, and apt to cake and form obstructions in the bowels. This will oftener be the case if the horse is suffered to drink much water soon after feeding upon wheat; for the water passing rapidly through the stomach and small intestines, in its way to the cœcum, carries off with it all the starch, which is the most nourishing, and leaves this sticky mass behind, which accumulates and hardens, and obstructs the intestines, and often destroys the horse. A horse that is fed on wheat should have very little hay. Wheaten flour, boiled in water to the thickness of starch, is given with good effect in over purging, and especially if combined with chalk and opium.

BEANS.—These form a striking illustration of the principle, that the nourishing or strengthening effects of the different articles of food depend more upon some peculiar property which they have, or some combination which they form, than on the actual quantity of nutritive matter. Beans contain but five hundred and seventy parts of nutritive matter, yet they add materially to the vigour of the horse. There is

no traveller who is not aware of the difference in the spirit and continuance of his horse if he allows or denies him beans on his journey. They afford not merely a temporary stimulus, but they may be daily used without losing their power, or producing exhaustion. Two pounds of beans may, with advantage, be mixed with the chaff of the agricultural horse, during the winter. In summer, the quantity may be lessened, or the beans altogether discontinued. Beans are generally given whole. This is very absurd; for the young horse, whose teeth are strong, seldom requires them; while the old horse, to whom they are in a manner necessary, is scarcely able to masticate them, swallows many of them whole which he is unable to break, and drops much from his mouth in the ineffectual attempt to break them. Beans should not be merely split, but crushed; they will even then give sufficient employment to the grinders of the animal.

PEAS are occasionally given. They appear to be in a slight degree more nourishing than beans, and not so heating. They contain five hundred and seventy-four parts of nutritive matter. For horses of slow work they may be used; but the quantity of chaff should be increased, and a few oats added. They have not been found to answer with horses of quick draught. It is essential that they should be crushed; otherwise on account of their globular form, they are apt to escape from the teeth, and many are swallowed whole. Exposed to warmth and moisture in the stomach, they swell very much, and may painfully and injuriously distend it.

Many horses have died after gorging themselves with peas, and the stomach has been found to have been burst by their swelling. If a small phial is filled with peas, and warm water poured on them, and the bottle tightly corked, it will burst in a few hours.

Herbage, green and dry, constitutes a principal part of the food of the horse. There are few things with regard to which the farmer is so careless as the mixture of grasses on both his upland and meadow pasture. Hence we find, in the same field, the ray grass, coming to perfection only in a loamy soil, not fit to cut until the middle or latter part of July, and yielding little aftermath; the meadow fox-tail, best cultivated in a clayey soil, fit for the scythe in the beginning of June, and yielding a plentiful aftermath; the glaucous fescue grass, ready at the middle of June, and rapidly deteriorating in value as its seeds ripen; and the fertile meadow grass, increasing in value until the end of July. These are circumstances the importance of which will, at no distant period, be recognised. In the mean time, Sinclair's account of the different grasses, or the condensation of the most important part of his work in Sir Humphry Davy's Agricultural Chemistry, are well deserving of the diligent perusal of the farmer.

Were there not too many proofs that the very refuse of the farm is often given to the agricultural horse, it would be needless to repeat that the animal that works constantly and hard should have the best food, and plenty of it. Old hay, as having longer undergone that slow process of fermentation by which the sugar that it contains is developed,

is far more nutritive and wholesome than new hay. *Mowburnt* hay is more injurious to horses than to any other of the domestic animals, and is a fruitful source of disease.

Where the manger system of feeding is not adopted, or where hay is still given at night, and corn in the day, there is no error into which the farmer is so apt to fall as to give an undue quantity of hay, and that generally of the worst kind. If the manger system is good, there can be no necessity for hay, or only for a small quantity of it; but if the rack is overloaded, the greedy horse will be eating all night, instead of taking his rest; and when the time for the morning feed arrives, his stomach will be already filled, and he will be less capable of work, from the want of sleep, and from the long-continued distension of the stomach rendering it impossible for the food to be properly digested.

It is a good practice to sprinkle the hay with water in which salt has been dissolved. It is evidently more palatable to the animal, who will leave the best unsalted hay for that of an inferior quality that has been moistened with brine; and there can be no doubt that the salt very materially assists the process of digestion. The preferable way of salting the hay would be to sprinkle it over the different layers as the rick is formed. From its attraction for water, it would combine with that excess of moisture which, in wet seasons, is the cause of too rapid and violent fermentation, and of the hay becoming mowburnt, or the rick sometimes catching fire, and it would become more incorporated with the hay. The only objection to its being thus used is, that the colour of the hay is not so bright; but this would be of little consequence for home consumption.

TARES are extensively used in England as food for horses, though but few farmers in this country have paid any attention to them. We recommend their use, with the hope that our "stock growers" will introduce them.

RYE GRASS affords a valuable article of food, but is inferior to the tare. It is not so nutritive; it is apt to scour; and occasionally, and late in the spring, it has appeared to become injurious to the horse.

CLOVER, for soiling the horse, is inferior to the tare and the rye grass, but is useful when they cannot be obtained.

LUCERN, where it can be obtained, is preferable even to tares, and SAINT-FOIN is superior to lucern. Although they contain but a small quantity of nutritive matter, that is easily digested, and perfectly assimilated; they speedily put both muscle and fat on the horse that is worn down by labour, and they are almost a specific for hide-bound. Some farmers have thought so highly of lucern as to substitute it for oats. This may do for the agricultural horse of slow and not hard work; but he from whom speedier action is sometimes required, and the horse of all work, must have a proportion of hard meat within him.

THE SWEDISH TURNIP is an article of food the value of which has not been sufficiently appreciated, and particularly for agricultural horses. Although it is far from containing the quantity of nutritive

matter which has been supposed, that, like the nutriment of the saint foin and the lucern, seems to be capable of easy and complete digestion. It should be sliced with chopped straw, and without hay.

CARROTS.—The virtues of this root are not sufficiently known, whether as contributing to the strength and endurance of the healthy horse, or the rapid recovery of the sick one. To the healthy horse they should be given sliced. Half a bushel will be a fair daily allowance. There is little provender of which the horse is fonder. Some farmers allow a bushel of carrots, without any oats; and the horses are said to be equal to all agricultural or slow work.

POTATOES have been given, and with advantage, in their raw state, but, where it has been convenient to boil or steam them, the benefit has been far more evident. Some have given boiled potatoes alone, and horses, instead of rejecting them, have soon preferred them even to the oat; but it is better to mix them with the usual manger feed, in the proportion of one pound of potatoes to two and a half pounds of the other ingredients. The use of the potato must depend on its cheapness, and the facility for boiling it. Half a dozen horses would soon repay the expense of a steaming boiler in the saving of provender, without taking into the account their improved condition and capability for work. A horse fed on potatoes should have his quantity of water materially curtailed.

FURZE has sometimes been given during the winter months, in England, but is not used in this country.

It may not be uninteresting to conclude this catalogue of the different articles of horse food with a list of the quantities of nutritive matter contained in each of them; for although these quantities cannot be considered as expressing the actual value of each, because other circumstances besides the simple quantity of nutriment seem to influence their effect in supporting the strength and condition of the horse, yet many a useful hint may be derived when the farmer looks over the produce of his soil, and inquires what other grasses or vegetables might suit his soil. The list is partly taken from Sir Humphry Davy's Agricultural Chemistry:—1000 parts of wheat contain 955 parts of nutritive matter; barley, 920; oats, 743; peas, 574; beans, 570; potatoes, 230; red beet, 148; parsnips, 99; carrots, 98. Of the grasses, 1000 parts of the meadow cat's tail contain at the time of seeding 98 parts of nutritive matter; narrow-leaved meadow grass in seed, and sweet-scented soft grass in flower, 95; narrow-leaved and flat-stalked meadow grass in flower, fertile meadow grass in seed, and tall fescue, in flower, 93; fertile meadow grass, meadow fescue, reed-like fescue, and creeping soft grass in flower, 78; sweet-scented soft grass in flower, and the aftermath, 77; tall fescue, in the aftermath, and meadow soft grass in flower, 74; cabbage, 73; crested dog's tail and brome flowering, 71; yellow oat, in flower, 66; Swedish turnips, 64; narrow-leaved meadow grass, creeping beet, round-headed cocksfoot, and spiked fescue, 59; roughish and fertile meadow grass, flowering,

56; florin, in summer, 54; common turnips, 42; saint-foin, broad leaved and long-rooted clover, 39; white clover, 32; and lucern, 23

The times of feeding should be as equally divided as convenience will permit. The small stomach of the horse is emptied in a few hours; and if he is suffered to remain hungry much beyond his accustomed time, he will afterwards devour his food so voraciously as to distend the stomach and endanger an attack of staggers. When this disease appears in the farmer's stable he may attribute it to various causes; the true one, in the majority of instances, is irregularity in feeding.

When extra work is required from the animal, the system of management is often injudicious; for a double feed is put before him, and as soon as he has swallowed it, he is started. It would be far better to give him a double feed on the previous evening, which will be digested before he is wanted, and then he may set out in the morning after a very small portion of corn has been given to him, or perhaps only a little hay. One of the most successful methods of enabling a horse to get well through a long journey is, to give him only a little at a time while on the road, and at night to give him a double feed of grain.

WATER.—This is a part of stable management little regarded by the farmer. He lets his horses loose morning and night, and they go to the nearest pond or brook and drink their fill, and no harm results, for they obtain that kind of water which nature designed them to have, in a manner prepared for them by some unknown influence of the atmosphere, as well as by the deposit on of many saline admixtures. The difference between *hard* and *soft* water is known to every one. In hard water soap will curdle, some vegetables will not boil soft, and the saccharine matter of the malt cannot be fully obtained in the process of brewing. There is nothing in which the different effect of hard and soft water is so evident as in the stomach and digestive organs of the horse. Hard water, drawn fresh from the well, will assuredly make the coat of a horse unaccustomed to it stare, and it will not unfrequently gripe and otherwise injure him. Instinct or experience has made even the horse himself conscious of this, for he will never drink hard water if he has access to soft: he will leave the most transparent and pure water of the well for a river, although the water may be turbid, and even for the muddiest spring. He is injured, however, not so much by the hardness of the well-water as by its coldness—particularly by its coldness in summer, and when it is many degrees below the temperature of the atmosphere. The water in the brook and the pond being warmed by long exposure to the air, as well as having become soft, the horse drinks freely of it without danger.

If the horse were watered three times a day, and especially in summer, he would often be saved from the sad torture of thirst, and from many a disease. Whoever has observed the eagerness with which the over-worked horse, hot and tired, plunges his muzzle into the pail, and the difficulty of stopping him until he has drained the last drop,

may form some idea of what he had previously suffered, and will not wonder at the violent spasms, and inflammation, and sudden death, that often result.

There is a prejudice in the minds of many people against the horse being fairly supplied with water. They think that it injures his wind, and disables him for quick and hard work. If he is galloped, as he too often is, immediately after drinking, his wind may be irreparably injured; but if he were oftener suffered to satiate his thirst at the intervals of rest, he would be happier and better. It is a fact unsuspected by those who have not carefully observed the horse, that if he has frequent access to water he will not drink so much in the course of the day, as another who, to cool his parched mouth, swallows as fast as he can, and knows not when to stop.

On a journey a horse should be liberally supplied with water. When he is a little cooled, two or three quarts of water may be given to him, and after that his feed. Before he has finished his corn two or three quarts more may be offered. He will take no harm if this be repeated three or four times during a long and hot day.

It is a judicious rule with travellers, that when a horse begins to refuse his food, he should be pushed no farther that day. It may, however, be worth while to try whether this may not proceed from thirst, as much as from exhaustion, for in many instances his appetite and his spirits will return soon after he has partaken of the refreshing draught.

MANAGEMENT OF THE FEET.—This is the only division of stable management that remains to be considered, and one sadly neglected by the hostler. The feet should be carefully examined every morning, for the shoes may be loose, and the horse would have been stopped in the middle of his work; or the clenches may be raised, and endanger the wounding of his legs; or the shoe may begin to press upon the sole or the heel, and bruise of the sole, or corn, may be the result; and, the horse having stood so long in the stable, every little increase of heat in the foot, or lameness, will be more readily detected, and serious disease may probably be prevented.

When the horse comes in at night, and after the harness has been taken off and stowed away, the heels should be well brushed out. Hand-rubbing will be preferable to washing, especially in the agricultural horse, whose heels, covered with long hair, can scarcely be dried again. If the dirt be suffered to accumulate in that long hair, the heels will become sore, and grease will follow; and if the heels are washed, and particularly during the winter, grease will result from the coldness occasioned by the slow evaporation of the moisture.

CHAPTER XV

A LIST OF THE MEDICINES USED IN THE TREATMENT OF THE DISEASES OF THE HORSE.

HE will rarely consult his own interest, who, not having had the advantage of veterinary knowledge, undertakes the treatment of any of the serious diseases of his horses. Many of the maladies of the horse so nearly resemble each other—and are so continually varying their character, and require, in their different stages, so different a treatment; and in the plainest case not only the characteristic symptoms of disease are obscure, but even the indications of returning health, or increasing danger, often scarcely ascertainable—so that the sick horse, as well as the human being, needs the care of one whom study and experience have qualified for the task. A list, however, of the drugs generally used, with a slight account of their history, adulterations, and medicinal effects, will be interesting to the horse-proprietor as well as to the farrier; and may occasionally be useful when professional aid cannot be obtained.

ALOES.—There are two kinds used in horse practice, the Barbadoes and the Cape. The Socotorine, preferred by the human surgeon, are very uncertain in their effect on the horse. Of the Barbadoes and the Cape, the first are much to be preferred. The Barbadoes aloes are obtained principally from the island of Barbadoes, and are the juice of the large leaves of the aloe boiled to a considerable thickness, and then poured into gourds in which they gradually harden. The true Cape is the extract of a species of aloes chiefly cultivated at the Cape of Good Hope. The Socotorine aloes are of a brown colour, inclining to red, and brittle. The Barbadoes aloes are black, with a shade of brown, of an unctuous feeling, with a stronger smell, broken with difficulty, and the fracture dull. The Cape are darker coloured, stronger smelling, very brittle, and the fracture perfectly glossy. Every person who uses much aloes should buy them in the mass, and powder them himself, and then, by attending to this account of the difference of the three, he can scarcely be imposed upon. Aloes purchased in powder are too often sadly adulterated. The Cape may be powdered at all times, and the Barbadoes in frosty weather, when enough may be prepared, to be kept in closed bottles, for the year's consumption. They may also be powdered when they have been taken from the gourd, and exposed to a gentle heat for two or three hours before they are put into the mortar. Fifteen ounces of the powder, mixed with one ounce of powdered ginger, and beaten up with eight ounces of palm oil, and afterwards divided into the proper doses, will form a purging mass more effectual, and much less likely to gripe, than any that can be procured by melting the drug. If the physic is given in the shape of ball, it more readily dissolves in the stomach, and more certainly and safely acts on the bowels when made up with some oily matter, like that just recommended, than when combined with syrup.

or honey, which are apt to ferment, and be themselves the causes of gripes. It is also worse than useless to add any diuretic to the mass, as soap or carbonate of soda. The action of these on one set of organs will weaken the action of the aloes on another. A physic dose should never be kept more than two or three months, for after that time it rapidly loses its purgative property.

Directions for physicking will be found at p. 120. We will only add that, as a promoter of condition, the dose should always be mild. A few fluid stools will be sufficient for every good purpose. Violent disease will alone justify violent purging.

Three drachms of Barbadoes aloes will have as much purgative power as four of the Cape, exclusive of griping less and being safer. If the horse is well mashed, and carefully exercised, and will drink plenty of warm water, the Cape may be ventured on, or at least mixed with equal quantities of the Barbadoes; but if there be any neglect of preparation for physic, or during the usual operation of the physic, the Cape are not to be depended upon, and may be dangerous.

Some persons are fond of what are called half-doses of physic. Three or four drachms are given in one day, and three or four on the following, and perhaps, if the medicine has not operated, as in this divided state it will not always, two or three additional drachms are given on the third day. The consequence is, that the bowels having been rendered irritable by the former doses, the horse is over-purged, and inflammation and death not unfrequently ensue, when the effect of the three becomes combined. In physicking a horse, whatever is to be done should be done at once. Whatever quantity is intended to be given, should be given in one dose.

The system of giving small doses of aloes as alteratives is not good. These repeated small doses lodging in some of the folds of the intestines, and at length uniting, often produce more effect than is desirable; and it is never safe to ride a horse far or fast, with even a small dose of aloes within him.

Most of all objectionable is the custom of giving small doses of aloes as a nauseant, in inflammation of the lungs. There is so much sympathy between the contents of the chest and the belly of the horse, and inflammation of one part is so likely to be transferred to another, that it is treading on very dangerous ground, when, with much inflammation of the lungs, that is given which will stimulate and may inflame the intestines.

Aloes are most commonly, because most easily, administered in the form of ball, but in a state of solution their effect is more speedy, effectual, and safe. Two ounces of aloes, and one ounce of gum (to suspend the imperfectly dissolved portion of the aloes), are put into a pint of boiling water, and the mixture frequently stirred. When it is cold, two ounces of tincture is added, as an aromatic, to prevent the griping of the aloes, and also to keep the mixture from fermenting. The aloes must not be boiled in the water; even five minutes' boiling

would take away much of the purgative effect of the drug. The dose of the solution should vary from six to eight ounces.

Aloes are useful in the form of tincture. Eight ounces of powdered aloes, and one ounce of powdered myrrh, should be put into two quarts of rectified spirit, diluted with an equal quantity of water. The mixture should be daily well shaken for a fortnight, and then suffered to stand, that the undissolved portion may fall to the bottom. This will constitute a very excellent application for wounds, whether recent or of long standing, and indisposed to heal. It is not only a gentle stimulant, but it forms a thin crust over the wound, and shields it from the action of the air.

The principal adulteration of aloes is by means of resin, and the alteration of colour is concealed by the addition of charcoal, or lamp-black. This adulteration is easily enough detected, by dissolving the aloes in hot water. All aloes contain some resinous matter, which the water will not dissolve, and which has very slight purgative effect.—The excess of this resin at the bottom of the solution will mark the degree of adulteration.

ALTERATIVES are a class of medicines the nature and effect of which are much misunderstood, and which are liable to much abuse. It is a very convenient name to excuse that propensity to dose the horse with medicines, which is the disgrace of the groom, and the lane of the stable. By alteratives we understand those drugs which effect some slow change in the diseased action of certain parts without interfering with the food or work; but by common consent the term seems to be confined to medicines for the diseases of the circulation, or of the digestive organs, or of the skin. If a horse is heavy and incapable of work from too good keeping, or if he is off his food from some temporary indigestion—or if he has mange or grease, or cracked heels, or swelled legs, a few alteratives are prescribed, and the complaint is gradually and imperceptibly removed. For all skin affections there is no better alterative than that consisting of black antimony, nitre, and sulphur. If there is any tendency to grease, two drachms of resin may be added to each ball. If the complaint be accompanied by weakness, a little gentian and ginger may be further added, but we enter our protest against the ignorant use, and almost against the use in the most skilful hands, of mercury in any form, or any of the mineral acids or mineral tonics, or heating spices, as alteratives. We indeed should be pleased if we could banish the term alterative altogether. The mode of proceeding which reason and science would dictate is to ascertain the nature and degree of the disease, and then the medicine which is calculated to restore the healthy action of the part, or, of the frame generally.

ALUM is occasionally used internally in cases of super-purgation in the form of alum-whey, two drachms of the powder being added to a pint of hot milk; but there are much better astringents, although this may succeed when others fail. If alum is added to a vegetable astringent, as oak bark, the power of both is diminished. Its principal

use is external. A solution of two drachms to a pint of water forms alone, or with a scruple of white vitriol, a very useful wash for cracked heels, and for grease generally; and also for those forms of swelled legs attended with exudation of moisture through the skin. Some add the Goulard lotion, forgetting the chemical decomposition that takes place; the result of which is, that the alumine, possessing little astringency, is detached, and two salts with no astringency at all, the sulphate of lead and the sulphate of potash, are formed.

The **BURNT ALUM** is inferior to the common alum for the purpose mentioned, and we have better stimulants or caustics, to apply to wounds.

AMMONIA, is, to the annoyance of the horse, and the injury of his eyes and his lungs, plentifully extricated from the putrefying dung and urine of the stable; but, when combined with water in the common form of hartshorn, it is seldom used in veterinary practice. It has been given, and with decided benefit, and when other things have failed, in flatulent colic; and is best administered in the form of the aromatic spirit of ammonia, and in doses of one or two ounces in warm water.

CHLORIDE OF AMMONIA, or sal ammoniac is scarcely deserving of a place in our list. It is not now used internally; and as an astringent embrocation, it must yield to several that are more effectual, and less likely to blemish.

ANODYNES.—Of these there is but one in horse practice. Opium is the only drug that will lull pain. It may be given as an anodyne, but it will also be an astringent in doses of one, two, or three drachms.

ANTIMONY.—There are several valuable preparations of this metal.

The **BLACK SULPHURET OF ANTIMONY**, (a compound of sulphur and antimony) is a good alterative. It is given with more sulphur and with nitre, in varying doses, according to the disease and the slow or rapid effect intended to be produced. The maximum dose, and especially if it is to be continued, should not exceed four drachms. It should never be bought in powder, for it is often grossly adulterated with lead, manganese, forge-dust, and arsenic. The adulteration may be detected by placing a little of the powder on a red-hot iron plate. The pure sulphuret will evaporate without the slightest residue—so will the arsenic, but there will be an evident smell of garlic; a portion of the lead and the manganese will be left behind.

EMETIC TARTAR, the tartrate of potash and antimony, or a combination of super-tartrate of potash and oxide of antimony, is a very useful nauseant, and has considerable effect on the skin. It is particularly valuable in inflammation of the lungs, and in every catarrhal affection. It is given in doses of one drachm, or one drachm and a half, and combined with nitre and digitalis. It is also beneficial in the expulsion of worms. Here it must be given in doses of two drachms, and with some mechanical vermifuge, as tin-filings, or ground glass, and administered on an empty stomach, and for several successive days. Although it may sometimes fail to expel the worm, it materially improves the condition of the horse, and produces sleekness

of the coat. To a slight degree the emetic tartar is decomposed by the action of light, and should be kept in a jar, or green bottle. It is sometimes adulterated with arsenic, which is detected by the garlic smell when it is placed on hot iron, and also by its not giving a beautiful gold-coloured precipitate when sulphuret of ammonia is added to a solution of it.

ANTIMONIAL POWDER, powder of oxide of antimony, with phosphate of lime. This, too, is adulterated with chalk, and plaster of Paris, burnt bones, and other white powders, and that to so shameful a degree, that little dependence can be placed on the antimonial powder usually sold by druggists. Muriatic or sulphuric acid will detect most of these adulterations.

Chloride of antimony is formed by distilling corrosive sublimate with antimony. The butter-like matter which is produced (whence the common name, *Butyr of Antimony*) has a strong affinity for water, which it attracts from the atmosphere, and thus becomes converted into a fluid. The less water it is suffered to attract to itself, the more powerful it remains, and therefore it should be kept in stopped bottles; and the proof of its goodness is its weight. It is decidedly the best liquid caustic we have; it is most manageable, and its effect can most readily be ascertained. As soon as it touches any muscular or living part, a change of colour is perceived on the part; and the effect of the caustic can be fairly judged of by the degree of change. For corns, canker, indisposition in the sole to secrete good horn, wounds in the foot not attended by healthy action, and for every case where the superficial application of a caustic is needed, the chloride of antimony is unrivalled.

ANTI-SPASMODICS.—Of these our list is scanty, for the horse is subject only to few spasmodic diseases, and there are fewer medicines which have an anti-spasmodic effect. Opium stands first for its general power, and that exerted particularly in locked jaw; and oil of turpentine as almost a specific for spasm of the bowels: camphor, assafoetida, and various others, used on the human subject, have very doubtful effect in the horse, or may be considered as almost inert.

ARSENIC.—Were it not that some practitioners continue to use it as a tonic, in doses of from ten to twenty grains daily, and others to core out old ulcers, we would not include it in our list, for we have little faith in it. There are better and safer tonics, and far better and safer caustics.

ASTRINGENTS are medicines that contract the living fibres, and thus close the mouths of small vessels, and restrain inordinate and dangerous discharges. Opium, alum, and catechu are powerful astringents in arresting intestinal and urinary evacuations; and alum and the superacetate of lead are astringents applied externally.

BALLS.—The usual and the most convenient mode of administering many medicines is in the form of balls, compounded with oil. Balls should never weigh more than an ounce and a half, or two ounces. otherwise they will be so large as to pass with difficulty down the

gullet. They should not be more than an inch in diameter and three inches in length. The mode of delivering balls is not difficult to acquire; and the balling iron, while it often wounds and permanently injures the bars, occasions the horse to struggle more than he otherwise would against the administration of the ball. The horse should be backed in the stall;—the tongue should be drawn gently out with the left hand on the off-side of the mouth, and there fixed, not by continuing to pull at it, but by pressing the fingers against the side of the lower jaw. The ball, being now taken between the tips of the fingers of the right hand, is passed rapidly up the mouth, as near to the palate as possible, until it reaches the root of the tongue; it is then delivered with a slight jerk, and the hand being immediately withdrawn and the tongue liberated, the ball is forced through the pharynx into the œsophagus. Its passage should be watched down the left side of the throat; and if it is not seen going down, a slight tap or blow under the chin will generally cause the horse to swallow, or a few gulps of water will carry it down.

BLISTERS are applications to the skin which separate the cuticle in the form of vesicles containing a serous fluid. They excite increased action in the vessels of the skin, by means of which this fluid is thrown out. The part or neighboring parts are somewhat relieved by this discharge, but more by the inflammation and pain which are produced, and which lessen the inflammation and pain previously existing in some contiguous part. On this principle we account for the decided relief often obtained by blisters in inflammation of the lungs; their efficacy in abating deeply-seated inflammation, as that of sprain of the tendons, ligaments, or joints; and the necessity of removing first, in these latter cases, the superficial inflammation caused by the sprain, that inflammation of a different kind may be excited instead of it, to which the deeply-seated inflammation of the part will be more likely to yield. The blisters used in horse-practice are composed only of cantharides or the oil of turpentine, to which some have added a tincture of the Croton-nut. The method of forming the best blister has been described.

BOLE ARMENIAN is an argillaceous earth combined with iron, and is supposed to possess some astringent property. The propriety of its being best administered inwardly is doubtful; for it may remain in the intestinal canal, and become the nut of a stone. On account of its supposed astringency, it is employed externally to give consistence to ointments for grease. Even the bole Armenian has not escaped the process of adulteration, and is largely mixed with inferior earths. The fraud may be suspected, but not satisfactorily detected, by the colour of the powder, which should be a bright red.

BURGUNDY PITCH.—See Resin.

CALAMINE.—See Zinc.

CALOMEL.—See Mercury.

CAMPHOR is the produce of one of the laurus species, a native of Japan, and is imitated by passing a stream of chlorine through oil

of turpentine. The efficacy of this drug when used internally is very doubtful. The camphor ball is a favourite with the groom, and occasionally administered by the farrier, but, seemingly, with no definite object, for it has not been yet determined whether it is to be considered as a sedative, anti-spasmodic, or stimulant. It is, however, a stimulant, when applied externally. In the form of camphorated oil, it promotes the absorption of fluids thrown out beneath the skin; the removal of old callus, and the suppleing of joints stiff from labour. Combined with oil of turpentine it is more effective, but in that combination it occasionally blemishes.

CANTHARIDES are the basis of the most approved and useful veterinary blisters. The cantharis is a fly, the native of Italy and the south of France, destroyed by sulphur, dried and powdered and mixed with palm oil and resin, in the proportions already directed. Its action is intense, and yet superficial; it plentifully raises the cuticle, but never injures the true skin, and therefore never blemishes. The application of other acrid substances is occasionally followed by deep-seated ulcerations; but a blister, composed of the Spanish fly alone, while it does its duty, leaves, after a few weeks have passed, scarcely a trace behind. The art of blistering consists in cutting, or rather shaving the hair perfectly close—then well rubbing in the ointment, for at least ten minutes—afterwards, and what is of the greatest consequence of all, plastering a little more of the ointment lightly over the part, and leaving it. As soon as the vesicles have perfectly risen, which will be in twenty or twenty-four hours, the torture of the animal may be somewhat relieved by the application of olive or neat's-foot oil, or any emollient ointment.

When too extensive a blister has been employed, or, from the intensity of the original inflammation, the blister has not risen, (for no two intense inflammations can exist in neighbouring parts at the same time,) strangury, or great difficulty in passing urine, or even suppression of it, has occurred. The careful washing off of the blister, and the administration of plenty of warm water, with opium, and bleeding if the symptoms run high, will generally remove this unpleasant effect.

An infusion of two ounces of the flies in a pint of oil of turpentine, for several days, is occasionally used as a liquid blister; and when sufficiently lowered with common oil, it is called a *sweating* oil, for it maintains a certain degree of irritation and inflammation on the skin, but not sufficient to blister, and thus gradually abates or removes some old or deep inflammation, or cause of lameness.

Cantharides have lately been recommended to be given internally, in doses, daily, or twice in the day, of five grains, and increasing the dose to fifteen grains, for the cure of glanders. The experiments are yet too few and indecisive to admit of any satisfactory conclusion. In these doses the fly has not been injurious, and the experiments are well worth prosecuting.

CARRAWAYS.—These and ginger are retained as the only cordials requisite for the horse.

CASTOR OIL, if it is a purgative in the horse, it must be given in the enormous and expensive doses of a pound or a pound and a half.

CATECHU, Japan earth, yet no earth, but extracted from the wood of one of the accacia trees, is a very useful astringent. It is given in superpurgation, in doses of one or two drachms, with one or one and a half drachm of opium, as a yet more powerful astringent; four drachms of chalk, to neutralize any acid in the stomach or bowels, and two drachms of powdered gum being also added, to sheath the over-irritated mucous coat of the intestines. It is not often adulterated in our country, but grossly so abroad—fine sand and aluminous earth being mixed with the extract. It should not be given with any alkali, yet the prescription just recommended contains chalk. But although the chalk, being an alkali, weakens the astringency of the catechu, it probably neutralizes some acid in the stomach or bowels, which would have diminished the power of the catechu to a greater degree. It must not be given in conjunction with any metallic salt, for the tannin or gallic acid, on which its power chiefly or entirely depends, has an affinity for all metals, and will unite with them, and form a gallate of them, possessing little astringent energy. Common ink is the union of this tannin principle with iron.

A tincture of catechu is sometimes made by macerating three ounces of the powder in a quart of spirit for a fortnight. It is very excellent for wounds; and, with the aloes, constitutes all that we want of a balsamic nature for the purpose of hastening the healing process of wounds.

CAUSTICS.—These are sometimes necessary to destroy fungous excrescences, or stimulate indolent ulcers, or remove portions of cellular substance or muscle infected by any poison. They are the butyr of antimony—blue vitriol—verdigris—corrosive sublimate—lunar caustic, and sulphuric acid. See these different substances.

CHALK is used only in combination with catechu for superpurgation, and in the proportions directed under the article Catechu. The prepared or levigated chalk is generally preferred.

CHAMOMILE.—The powder of the flower is a useful vegetable tonic and the mildest in our list. It is given in doses of one or two drachms, and is exhibited in the early stage of convalescence to ascertain whether the febrile stage of the disease is passed, and to prepare the way for a more powerful tonic, the gentian. If no acceleration of pulse, or heat of mouth, or indication of return of fever, accompanies the cautious use of the chamomile, the gentian, with carbonate of iron, may be safely ventured on; but if the gentian had been used first, and a little too soon, there might have been a considerable, and perhaps a dangerous return of fever.

CHARCOAL is a useful antiseptic, and, mixed with a poultice, readily removes the foetid smell of unhealthy ulcers, or cracked heels.

CHARGES are thick adhesive plasters spread over parts that have been strained or weakened, and, being applied to the skin warm, adhere for a considerable time. The following mixture makes a good charge—Burgundy or common pitch, five ounces; tar, six ounces; yellow wax, one ounce, melted together, and when they are becoming cool, half a drachm of powdered cantharides well stirred in. This must be partially melted afresh when applied, and put on the part with a large spatula, as hot as it can be without giving the animal too much pain. Flocks of tow should be scattered over it while it is warm, and thus a thick and adhesive covering will be formed, which cannot be separated from the skin for many months. This is applied for old sprains of the loins, and also strains of the back sinews. The charge acts in three ways—by the slight stimulant power which it possesses it gradually removes all deep-seated inflammation—by its stimulus and by its pressure it promotes the absorption of any callus or thickening beneath; and, acting as a constant bandage, it gives tone and strength to the part.

CLYSTERS.—These are useful and too often neglected means of hastening the evacuation of the bowels, when the disease requires their speedy action. The ox-bladder and wooden pipe may still be employed, and a considerable quantity of fluid may be thrown into the intestine.

Two ounces of soft or yellow soap, dissolved in a gallon of warm water, will form a useful aperient clyster; it will detach or dissolve many irritating substances that may have adhered to the mucous coat of the bowels. For a more active aperient, eight ounces of Epsom salts, or even of common salt, may be dissolved in the same quantity of water: a more active injection, but not to be used if much purgative medicine has been previously given, may be composed of an ounce of Barbadoes aloes, dissolved in two or three quarts of warm water. If nothing else can be procured, warm water may be employed; it will act as a fomentation to the inflamed and irritable surface of the bowels, and will have no inconsiderable effect even as an aperient.

In cases of over-purging or inflammation of the bowels, the injection must be of a soothing nature: it may consist of gruel alone; or if the purging be great, and difficult to stop, the gruel must be thicker, four ounces of prepared or powdered chalk being well mixed with or suspended in it, with two scruples or a drachm of powdered opium.

No oil should enter into the composition of a clyster, except that linseed oil may be used for the expulsion of the ascarides, or needle-worms.

In epidemic catarrh, when the horse sometimes obstinately refuses to eat or to drink, his strength may be supported by nourishing clysters; but they should consist of thick gruel only, and not more than a quart should be administered at once, for a greater quantity would be returned soon after the pipe is withdrawn. Strong broths, and more particularly ale and wine, are dangerous ingredients; they may rapidly

aggravate the fever, and should never be administered, but under the superintendence, or by the direction of an experienced farrier.

The principal art of administering a clyster consists in not frightening the horse. The pipe, well oiled, should be very gently introduced, and the fluid not too hastily thrown up; and its heat should be as nearly as possible that of the intestine, or about blood-heat.

COPPER.—There are two combinations of this metal used in veterinary practice: the verdigris or subacetate, and the blue vitriol or sulphate.

Verdigris is the common rust of copper, produced by vinegar, or any thing sour, or even common salt. It is given internally by some practitioners, in doses of two or three drachms daily, as a tonic, and particularly for the cure of farcy. It is, however, an uncertain and dangerous medicine. The corrosive sublimate, with vegetable tonics, is preferable. *Verdigris* is, however, usefully applied externally as a mild caustic. Either alone, in the form of fine powder, or mixed with an equal quantity of the sugar (superacetate) of lead, it eats down proud flesh, or stimulates old ulcers to healthy action; when boiled with honey and vinegar, it constitutes the farriers' *Egyptiacum*, certainly of benefit in cankered or ulcerated mouth, and no bad application for thrushes; but yielding, as it regards both, to better remedies, which have been mentioned under the proper heads. Some practitioners use alum and oil of vitriol in making their *Egyptiacum*, forgetting the strange decomposition which is produced.

Blue Vitriol is the union of sulphuric acid and copper; it is a very favourite tonic with many, and has been vaunted as a specific for glanders; while others, and we think properly, have no very good opinion of it in either respect. As a cure for glanders, its reputation is now nearly passed by; as a tonic, when the horse is slowly recovering from severe illness, it is dangerous, and its internal use should be confined to cases of long continued discharge from the nose, when catarrh or fever has ceased. It may then be given with benefit in doses of from one to two drachms twice in the day, but it should be combined with gentian and ginger. It is principally valuable as an external application, dissolved in water in the proportion of two drachms to a pint, and acts as a gentle stimulant; but when an ounce is dissolved in the same quantity of water it becomes a mild caustic. In the former proportion, it rouses old ulcers to a healthy action, and disposes even recent wounds to heal more quickly than they otherwise would do; and in the latter it removes fungous granulations or proud flesh. The blue vitriol is sometimes reduced to powder and sprinkled upon the wound for this purpose, and is a good application for canker in the foot.

CORDIALS are useful or injurious according to the judgment with which they are given. When a horse comes home thoroughly exhausted, and refuses his food, a cordial may be beneficial; it may rouse the stomach and the system, and may prevent cold and fever; but it is poison to the animal when administered after the cold is

actually caught and fever begins to appear. More to be reprobated is the practice of giving *frequent* cordials, that, by their stimulus on the stomach, (the skin sympathising so much with the stomach,) a fine coat may be produced. The artificial excitement of the cordial soon becomes as necessary to enable the horse to do even common work, as is the excitement of the dram to sustain the animal spirits of the drunkard.

To recall the appetite of the horse slowly recovering from illness a cordial may sometimes be allowed; or to old horses that have been worked hard and used to these excitements when young; or to draught horses, that have exhibited slight symptoms of staggers, when their labour has been unusually protracted, and their stomachs left too long empty; or mixed with diuretic medicine, to fine the legs of the overworked and debilitated animal; otherwise they should never find a place in the stable, or be used at the discretion of the carter or the groom. The most harmless cordial if abused, and the best if given with discretion, is composed of four parts each of carraway powder and bruised raisins, and two each of ginger and palm oil, well beaten into a mass.

CORROSIVE SUBLIMATE.—See Mercury.

CREAM OF TARTAR.—See Superacetate of Potash.

CROTON TIGLII.—The croton-nut has not been long introduced into veterinary practice, although it has been used from time immemorial by the inhabitants of India as a powerful purgative. An oil has been extracted from it, and used by the surgeon; the meal is adopted by the veterinarian. It is given in doses from a scruple to a half a drachm, and, from its acrid nature, in ball with an ounce of linseed meal. When it does operate, the effect is generally observed in six or eight hours, and the stools are profuse and watery, and the patient frequently griped. On account of its quick operation, it may be given in locked jaw and staggers; and also in dropsy of the chest or belly, from the watery and profuse stool it produces; but it is often uncertain in its operation, and its griping and the debility it occasions are serious objections to it as common physic. A turpentine tincture of the powdered nut makes an active blister; but not so effectual or so safe as the cantharides.

DIAPHORETICS, are medicines that increase the sensible and insensible perspiration of the animal. These, as it regards the horse, are neither many nor powerful. Antimony in its various forms, and sulphur, have some effect in opening the pores of the skin, and exciting its vessels to action, and especially when assisted by warmth of stable or clothing, and therefore useful in those diseases where it is desirable that some portion of the blood should be diverted from the overloaded, and inflamed, and vital organs of the chest, to the skin or the extremities; but the only diaphoretics on which much confidence can be placed, and especially to produce condition, are warm clothing and good grooming.

DIGESTIVES are applications to recent or old wounds, as mild stimulants to produce a healthy appearance and action in them, and to cause them more speedily to heal. A weak solution of blue vitriol is an excellent digestive; so is the tincture of aloes, and the tincture of myrrh. The best digestive ointment is one composed of three parts of the common calamine ointment (Turner's cerate) and one of common turpentine.

DIGITALIS.—The leaves of the common fox-glove, gathered about the flowering time, dried carefully in the dark, powdered, and kept in a close black bottle, form one of the most valuable medicines in veterinary practice. It is a direct and powerful sedative, diminishing the frequency of the pulse, and the general irritability of the system, and acting also as a mild diuretic; it is therefore useful in every inflammatory and febrile complaint, and particularly in inflammation of the chest. It is usually given in combination with emetic tartar and nitre. The average dose would be one drachm of digitalis, one and a half of emetic tartar, and three of nitre, and repeated twice or thrice in the day. Digitalis seems to have an immediate effect on the heart, lessening the number of its pulsations; but lessening them in a singular manner, not by causing it to beat more slowly, but by producing certain intermissions or pauses in its action. When these become marked; when at every sixth or seventh beat, the pulsations are suspended, while two or three could be slowly counted, this is precisely the effect which is intended to be produced; and however ill the horse may appear to be, or however alarming this intermittent pulse may seem to the by-standers, from that moment the animal will begin to amend. The dose must then be diminished one half, and in a few days it may be omitted altogether; but the emetic tartar and the nitre should be continued, even for some days after the practitioner deems it prudent to try the effect of mild vegetable tonics. There is no danger in the intermittent pulse thus produced; but there is much danger when the digitalis fails to produce any effect on the circulation. The disease is then too powerful to be arrested by medicine. Digitalis requires watching; but the only consequence to be apprehended from an over-dose, is, that the patient may be reduced a little too low, and his convalescence retarded for a day or two.

In the form of infusion or tincture, digitalis is very useful in inflammation of the eyes. It is almost equal in power to opium, and it may with great advantage be alternated with it, when opium begins to lose its power. The infusion is made by pouring a quart of boiling water on an ounce of the powder. A portion of the liquid should be introduced into the eye. Of the tincture one or two drops should be introduced. To form the tincture, three ounces of the digitalis should be added to a quart of spirit.

The infusion has been serviceable in mange; but there are better applications.

DIURETICS constitute a useful, but much abused class of medicines. They stimulate the kidneys to secrete more than the usual

quantity of urine, or to separate a greater than ordinary proportion of the watery parts of the blood; but the deficiency of water in the blood thus occasioned must be speedily supplied, or the healthy circulation could not be carried on, and it is generally supplied by the absorbents taking up the watery fluid in some part of the frame, and carrying it into circulation. Hence the evident use of diuretics in every dropsical affection, in swelled legs, and also in inflammation and fever, by lessening the quantity of the circulating fluid, and therefore the quantity which is sent to inflamed parts.

All this, however, is produced by the kidneys being stimulated to increased action, and if this stimulus is too often or too violently applied, the energy of the kidney may be impaired, or inflammation may be produced. That inflammation may be of an acute character, and destroy the patient; or, although not intense in its nature, it may by frequent repetition assume a chronic character, and more slowly, but as surely, do irreparable mischief. Hence the necessity of attention to that portion of the food which may have a diuretic power. Mowburnt hay and foxy oats are the unsuspected causes of many a disease in the horse, at first obscure, but ultimately referable to injury or inflammation of the urinary organs. Hence, too, the impropriety of suffering medicines of a diuretic nature to be at the command of the ignorant carter or groom. In swelled legs, cracks, grease or accumulation of fluid in any part, and in those superficial eruptions and inflammations which are said to be produced by humors floating in the blood, diuretics are evidently beneficial; but they should be as mild as possible, and should not be oftener given or continued longer than the case requires. The expensive Castile soap, and camphor, so often resorted to, are not needed; the common liquid turpentine is quite sufficient in all ordinary cases, and nitre and digitalis may be added if fever is suspected.

DRINKS.—Many practitioners and horse proprietors have a great objection to the administration of medicines in the form of drinks. A drink is not so portable as a ball, it is more troublesome to give, and a portion of it is usually wasted. If the drink contains any acid substance, it is apt to excoriate the mouth, or to irritate the throat already sore from disease, or the unpleasant taste of the drug may unnecessarily nauseate the horse. There are some medicines, however, which must be given in the form of drink, as in colic, and the time, perhaps, is not distant when purgatives will be thus administered, as more speedy and safer in their operation. In cases of much debility and entire loss of appetite, all medicine should be given in solution, for the stomach may not have sufficient power to dissolve the paper in which the ball is wrapped, or the substance of the ball.

An ox's horn, the larger end being cut slantingly, is the usual and best instrument for administering drinks. The noose of a halter is introduced into the mouth, and then, by means of a stable fork, the head is elevated by an assistant considerably higher than for the delivery of a ball. The farrier stands on the off-side of the horse, and

draws out the tongue with the left hand; he then with the right hand introduces the horn gently into the mouth, over the tongue, and by a dexterous turn of the horn empties the whole of the drink into the back part of the mouth; the horn is now quickly withdrawn, and the tongue loosened, when the greater portion of the fluid must be swallowed. A portion of it however will often be obstinately held in the mouth for a long time, and the head must be kept up until the whole is swallowed, which a quick but not violent slap in the muzzle will generally compel the horse to do. The art of giving a drink consists in not putting too much into the horn at once; introducing the horn far enough into the mouth, and quickly turning and withdrawing it, without bruising or wounding the mouth, the tongue being loosened at the same moment. A bottle is a disgraceful and dangerous instrument to use.

ELDER.—The elder leaf, boiled in lard, forms an emollient ointment, usefully applied to inflamed and irritated parts.

EPSOM SALTS.—See Magnesia.

FOMENTATIONS open the pores of the skin and promote perspiration in the part, and so abate the local swelling, and relieve pain and lessen inflammation. They are often used, and with more effect when the inflammation is somewhat deeply seated, than when it is superficial. The effect depends on the warmth of the water, and not on any herb which may have been boiled in it. They are best applied by means of flannel, frequently dipped in the hot water, or on which the water is poured, and the heat should be as great as the hand will bear. The benefit that might be derived from them is much impaired by the absurd method in which the fomentations are conducted. They are rarely continued long enough, and when they are removed, the part is left wet and uncovered, and the coldness of evaporation succeeds to the heat of fomentation. The perspiration is thus suddenly checked, the animal suffers considerable pain, and more harm is done by the extreme change of temperature than if the fomentation had not been attempted.

GENTIAN stands at the head of the vegetable tonics, and it is a stomachic as well as a tonic. It is equally useful in chronic debility, and in that which is consequent on severe and protracted illness. It is generally united with chamomile, ginger, and, when the patient will bear it, carbonate of iron. Four drachms of gentian, two of chamomile, one of carbonate of iron, and one of ginger, will make an excellent tonic ball. An infusion of gentian is one of the best applications to putrid ulcers.

GINGER is as valuable for a cordial, as gentian is for a tonic. It is the basis of the cordial ball, and it is indispensable in the tonic ball. Although it is difficult to powder, the veterinary practitioner should always purchase it in its solid form. If the root be large, heavy, and not worm-eaten, the black ginger is as good as the white, and considerably cheaper. The powder is adulterated with bean-meal and the

sawdust of box-wood, and rendered warm and pungent by means of capsicum.

GOULARD'S EXTRACT.—See Lead.

HELLEBORE, WHITE, is a powerful nauseant, and lowers both the force and the frequency of the pulse, and is therefore given with good effect in various inflammations, and particularly that of the lungs; but it requires watching. If it is pushed a little too far, trembling and giddiness, and purging follow, and the horse is sometimes lost. The hanging of the head, frothing of the mouth, and, more particularly, the sinking of the pulse, would give warning of danger; but the medical attendant may not have the opportunity of observing this, and when he does observe it, it may be too late. Its dose varies from a scruple to half a drachm. In doses of a drachm it could not be given with safety; and yet, such is the different effect of medicines given in different doses, that in the quantity of an ounce it is said to be a diuretic and a tonic, and exhibited with advantage in chronic and obstinate grease.

HEMLOCK is used by some practitioners, instead of digitalis or hellebore, in affections of the chest, whether acute or chronic; but it is inferior to both. The dose of the powder of the dried leaves is about a drachm.

INFUSIONS.—The active matter of some vegetable substances is partly or entirely extracted by water. Dried vegetables yield their properties more readily and perfectly than when in their green state. Boiling water is poured on the substance to be infused, and which is previously grossly pounded or powdered; the vessel is then covered and placed by a fire. In five or six hours the transparent part may be poured off, and is ready for use. In a few days, however, all infusions become thick, and lose their virtue, from the decomposition of the vegetable matter.

The infusion of chamomile is advantageously used instead of water in compounding a mild tonic drench: the infusion of catechu is useful in astringent mixtures; the infusion of linseed is used instead of common water in catarrh and cold; and the infusion of tobacco in some injections.

IODINE.—This substance is but lately introduced into veterinary practice, and has been given with effect in doses of five grains daily, to reduce the enlarged glands which sometimes remain after catarrh. It has likewise power in reducing almost every species of tumour, and may be tried where it would be dangerous to use the knife.

IRON.—Of this metal there are two preparations adopted by veterinarians. The rust, or *Carbonate*, is a mild and useful tonic in doses from two to four drachms. The *Sulphate* (green vitriol or *COPPERAS*) is more powerful, but should never be given in early stages of recovery, and always with caution. The dose should be the same as that of the carbonate. The sulphate has lately been recommended for the cure of that deceitful stage or form of glanders, in which there is nothing to characterize the disease but a very slight discharge from

the nostrils. It is to be dissolved in the common drink of the horse. It is worth a trial, but too sanguine expectations must not be encouraged of the power of any drug over this intractable malady. Iron should be given in combination with gentian and ginger, but never with any alkali or nitre, or soap, or catechu, or astringent vegetable.

Forge-water used to be a favorite tonic with farriers, and also a lotion for canker and ulcers in the mouth. It owes its power, if it has any, to the iron with which it is impregnated.

JUNIPER OIL.—This essential oil is retained because it has some diuretic property, and is a pleasant aromatic. It may, therefore, enter into the composition of the diuretic ball.

LARD.—This or palm oil is far preferable to honey, or molasses, or syrups, for making up balls, because the ball more readily dissolves in the stomach. It likewise renders a purgative less liable to gripe. It is the principal basis of all ointments.

LAUDANUM.—See **OPIUM**.

LEAD.—Combinations of this metal are admitted into veterinary practice. The subacetate is common under the name of *Extract of Lead*, or *Goulard's Extract*. It is used in the proportion of a drachm to a pint of water in the early stages of inflammation of the eye; but is inferior both to the opium and digitalis, and cannot be used in combination with either. In double the proportion it is serviceable in superficial inflammations of various kinds, or in poultices for the feet where there is much inflammation or pain; but in cases of sprain, or deep injury, or inflammations, it is perfectly useless. If white vitriol or alum are added to the lead, the efficacy of all the ingredients is destroyed.

The *Sugar of Lead* is the acetate or superacetate of that metal. This, dissolved in water in the proportion of two drachms to a pint, makes an extemporaneous Goulard's Lotion, but not more valuable than the former.

White Lead (carbonate of lead) is sometimes sprinkled, in the form of fine powder, and with advantage, on swelled legs, where the skin is very red and irritable, and moisture is exuding through it. It is used alone or mixed with paste, or a bread-and-water poultice: but lead, although in the first-mentioned form a great favourite with many persons, might, without great loss, be expunged from the Veterinary Pharmacopœia.

LIME was formerly sprinkled over cankered feet and greasy heels, but there are less painful caustics, and more effectual absorbents of moisture. Lime water is rarely used, but the *Chloride of Lime* is exceedingly valuable. Diluted with twenty times its quantity of water, it should help to form the poultice applied to every part from which there is the slightest offensive discharge. The fœtid smell of fistulous withers, pole-evil, canker, and ill-conditioned wounds, is immediately removed, and the ulcers are more disposed to heal. When mangy horses are dismissed as cured, a washing with the diluted chloride will remove any infection that might lurk about them, or which

they might carry from the place in which they have been confined. One pint of the chloride mixed with three gallons of water, and brushed over the walls and manger and rack of the foulest stable, will completely remove all infection. All horse furniture worn by a glandered or mangy animal will be effectually purified in the same way. Internally administered, it seems to have no power.

LINIMENTS are oily applications of the consistence of a thick fluid, and designed either to sooth an inflamed surface, or, by gently stimulating the skin, to remove deeper seated pain or inflammation. As an emollient liniment, one composed of half an ounce of extract of lead and four ounces of olive oil will be useful. For sprains, old swellings, or rheumatism, two ounces of hartshorn, the same quantity of camphorated spirit, an ounce of oil of turpentine, half an ounce of laudanum, and a drachm of oil of origanum, may be mixed together; or an ounce of camphor may be dissolved in four ounces of sweet oil, to which an ounce of oil of turpentine and a drachm of oil of origanum should be afterwards added. A little powdered cantharides, or tincture of cantharides, or mustard powder, will render either of these more powerful, or convert it into a liquid blister.

LINSEED.—An infusion of linseed is often used instead of water, for the drink of the horse with sore-throat or catarrh. A pail containing it should be slung in the stable or loose box. Thin gruel, however, is preferable; it is as bland and soothing, and more nutritious. Linseed meal forms the best poultice for almost every purpose.

The oil of linseed is not a certain, but always a safe purgative. It must be given, however, in doses of a pint or a pint and a half.

LOTIONS.—Many of the best Lotions have been already described, in the chapters which treat of the various diseases of the horse.

MAGNESIA.—The sulphate of magnesia, or **EPSOM SALTS**, should be used only in promoting the purgative effect of clysters, or, in repeated doses of six or eight ounces, gently to open the bowels at the commencement of fever. Some doubt, however, attends the latter practice; for the dose must often be thrice repeated before it will act, and then, although safer than aloes, it may produce too much irritation in the intestinal canal, especially if the fever be the precursor of inflammation of the lungs.

MASHES constitute a very important part of horse provender, whether in sickness or health. A mash given occasionally to a horse that is otherwise fed on dry meat prevents him from becoming dangerously costive. To the overworked and tired horse nothing is so refreshing as a warm mash with his usual allowance of corn in it. The art of getting a horse into apparent condition for sale, or giving him a round and plump appearance, consists principally in the frequent repetition of mashes, and from their easiness of digestion and the mild nutriment which they afford, as well as their laxative effect, they form the principal diet of the sick horse.

Mashes are made by pouring boiling water on bran, and stirring it well, and then covering it over until it is sufficiently cool for the horse

to eat. If in the heat of summer a cold mash is preferred, it should, nevertheless, be made with hot water, and then suffered to remain until it is cold. This is not always sufficiently attended to by the groom, who is not aware that the efficacy of the mash depends principally on the change which is effected in the bran and the other ingredients by the boiling water rendering them more easy of digestion, as well as aperient. If the horse refuses the mash, a few oats may be sprinkled over it, in order to tempt him to eat it; but if it is previously designed that corn should be given in the mash, it should be scalded with the bran, to soften it and render it more digestible. Bran mashes are very useful preparatives for physic, and they are necessary during the operation of the physic. They very soon become sour, and the manger of the horse of whose diet they form a principal part, should be daily and carefully cleaned out.

When horses are weakly and much reduced, malt mashes will often be palatable to them and very nutritive: but the water that is poured on a malt mash should be considerably below the boiling heat, or the malt will be set, or clogged together. If owners were aware of the value of a malt mash, it would be oftener given when the horse is rapidly getting weaker from protracted disease, or when he is beginning to recover from a disease by which he has been much reduced. The only exception to their use is in cases of chest affection, in which they must not be given too early. In grease, and in mange accompanied by much emaciation, malt mashes will be peculiarly useful, and especially if they constitute a principal portion of the food.

MERCURY.—The *Mercurial Ointment* is prepared by rubbing quicksilver with lard, in the proportion of one part of mercury to three of grease, until no globules appear; the practitioner should, if possible, prepare it himself, for he can neither get it pure nor of the proper strength from the druggist. It is employed with considerable advantage in preparing splents, spavins, or other bony or callous tumours, for blistering or firing. One or two drachms, according to the nature and size of the swelling, may be daily well rubbed in; but it should be watched, for it sometimes salivates the horse very speedily. The tumours more readily disperse, at the application of the stronger stimulant, when they have been thus prepared. Mercurial ointment in a more diluted form is sometimes necessary for the cure of mallerders and sallenders; and in very obstinate cases of mange.

Calomel, the submuriate or protochloride of mercury, may be given, combined with aloes, in mange, surfeit, or worms; yet better alteratives and more efficient vermifuges have been described. It is admissible in some cases of chronic cough, in farcy, and in jaundice, but is not a medicine that seems to agree with the horse. Alone it has little purgative effect, but it assists the action of other aperients. It is given in doses from a scruple to a drachm, but must not be too often or too long repeated. As soon as the gums become red, or the animal begins to quid or drop his hay, it must be discontinued.

Corrosive Sublimate, the oxymuriate or bichloride of mercury, combined with chlorine in a double proportion, is a useful tonic in farcy, and perhaps the most to be depended upon. It should be given in doses of ten grains daily, and gradually increased to a scruple, until the horse is purged, or the mouth becomes sore, when it may be omitted for a few days, and resumed. Some have recommended it as a diuretic, but it is too dangerous a medicine for this purpose. It is used externally in solution; and in substance in quittor, as a stimulant to foul ulcers; and in the proportion of five grains to an ounce of rectified spirit in obstinate mange or to destroy vermin on the skin. It is, however, too uncertain and too dangerous a medicine for the horse-proprietor to venture on its use without the sanction of a veterinary surgeon.

Æthiop's Mineral, the black sulphuret of mercury, is not often used in horse practice, but it is a good alterative for obstinate surfeit or foulness of the skin, in doses of three drachms daily. Four drachms of cream of tartar may be advantageously added to each dose.

MINT.—If the use of an infusion or decoction of this plant, or of the oil that is extracted from it, can be at any time admitted, it is a vehicle in which the oil of turpentine and laudanum may be administered in cases of colic.

MYRRH may be used in the form of tincture, or it may be united to the tincture of aloes as a stimulating and digestive application to wounds. Diluted with an equal quantity of water, it is a good application for canker in the mouth, but as an internal medicine it seems to be inert.

NITRE.—See Potash.

NITROUS ÆTHER, SPIRIT OF, is a very useful medicine in the advanced stages of fever, for while it to a certain degree rouses the exhausted powers of the animal, and may be denominated a stimulant, it never brings back the dangerous febrile action which was subsiding. It is given in doses of three or four drachms.

OILS.—The farrier's list contains many of them, but the scientific practitioner has discarded the greater part; those that are worth retaining will be found under the names of the vegetables from which they are extracted.

OINTMENTS.—These have been fully described under the accidents and diseases in which their use is required.

OLIVES, OIL OF.—This is sometimes given as a purgative when aloes or other aperients cannot be obtained. It is useless to give it in a less quantity than a pint, and then it is uncertain in its operation, although harmless. In all liniments and ointments, spermaceti, or even linseed oil, may be substituted without detriment, and the peculiar smell of the latter may be subdued by oil of aniseed or origanum.

OPTUM.—However underrated by some, there is not a more valuable drug on our list. It does not often act as a narcotic except in enormous doses; but it is a powerful antispasmodic, sedative, and astringent. As an antispasmodic, it enters into the colic drink, and it is the shee'

anchor of the veterinarian in the treatment of tetanus or locked jaw. As a sedative, it relaxes that universal spasm of the muscular system, which is the characteristic of tetanus; and perhaps it is only as a sedative that it has such admirable effect as an astringent; for when the irritation about the mouths of the vessels of the intestines and kidneys is allayed by the opium, undue purging and profuse staling are necessarily arrested. It should, however, be given with caution. It is its secondary effect which is sedative, and, if given in cases of fever, its primary effect in increasing the excitation of the frame is marked and injurious. In the early and acute stage of fever, it would be bad practice to give it in the smallest quantity; but when the fever has passed, or is passing, there is nothing which so rapidly subdues the irritability that accompanies extreme weakness; and it becomes an excellent tonic, because it is a sedative.

If the blue or green vitriol, or cantharides, have been pushed too far, opium soonest quiets the disorder they have occasioned. It is given in doses of one or two drachms; either the powdered opium, being made into a ball, or the crude opium dissolved in hot water, and given with its sediment. Other medicines are usually combined with it, according to the circumstances of the case.

Externally, it is useful in ophthalmia. In the form of decoction of the poppy head it may constitute the basis of an anodyne poultice; but it must not be given in union with any alkali, with the exception of chalk, in over-purging; nor with the superacetate of lead, by which its powers are materially impaired, nor with sulphate of zinc, or copper, or iron.

From its high price it is much adulterated, and it is rare to meet with it in a state of purity. The best tests are its smell, its taste, its toughness and pliancy, its fawn or brown colour, and its weight, for it is the heaviest of all the vegetable extracts, except gum arabic; yet its weight is often fraudulently increased by stones and bits of lead being concealed in it. The English opium is almost as good as the Turkish, and frequently sold for it; but it is distinguishable by its blackness and softness.

PALM OIL, when genuine, is the very best substance that can be used for making masses and balls. It has a pleasant smell, and it never becomes rancid.

PITCH is used to give adhesiveness and firmness to charges and plasters. The common pitch is quite as good as the more expensive Burgundy pitch. The best plaster for sand-crack consists of one pound of pitch and an ounce of yellow bees-wax melted together.

PHYSIC.—The cases which require physic, the composition of the most effectual and safest physic ball, and the mode of treatment under physic, have been already described.

POTASH.—Two compounds of potash are used in veterinary practice. The Nitrate of Potash, *Nitre*, is a valuable cooling medicine, and a mild diuretic, and, therefore, it should enter into the composition of every fever ball. Its dose is from two to four drachms. Grooms often

dissolve it in the water. There are two objections to this: either the horse is nauseated and will not drink so much water as he ought; or the salt taste of the water causes considerable thirst, and disinclination to solid food. Nitre, while dissolving, materially lowers the temperature of water, and furnishes a very cold and useful lotion for sprain of the back sinews, and other local inflammations. The lotion, however, should be used as soon as the salt is dissolved, for it quickly becomes as warm as the surrounding air. The Supertartrate of Potash, *Cream of Tartar*, is a mild diuretic, and, combined with Æthiop's mineral, is a useful alterative in obstinate mange or grease.

POULTICES.—Few horsemen are aware of the value of these simple applications in abating inflammation, relieving pain, cleansing wounds, and disposing them to heal. They are fomentations of the best kind continued much longer than a simple fomentation can be. In all inflammations of the foot they are very beneficial, softening the horn, hardened by the heat of the foot, and contracted and pressing on the internal and highly sensible parts. The moisture and warmth are the useful parts of the poultice; and that poultice is the best for general purposes in which moisture and warmth are longest retained. Perspiration is most abundantly promoted in the part, the pores are opened, swellings are relieved, and discharges of a healthy nature procured from wounds.

Linseed meal forms the best general poultice, because it longest retains the moisture. Bran, although frequently used for poultices, is objectionable, because it so soon becomes dry. To abate considerable inflammation, and especially in a wounded part, Goulard may be added, or the linseed meal may be made into a paste with a decoction of poppy heads. To promote a healthy discharge from an old or foul ulcer; or separation of the dead from the living parts, in the process of what is called coring out; or to hasten the ripening of a tumour that must be opened; or to cleanse it when it is opened, two ounces of common turpentine may be added to a pound of linseed meal: but nothing can be so absurd, or is so injurious, as the addition of turpentine to a poultice that is designed to be an emollient. The drawing poultices and stoppings of farriers are often highly injurious, instead of abating inflammation.

If the ulcer smells offensively, two ounces of powdered charcoal may be added to the linseed meal, or the poultice may be made of water, to which a solution of the chloride of lime has been added in the proportion of half an ounce to a pound. As an emollient poultice for grease and cracked heels, and especially if accompanied by much unpleasant smell, there is nothing preferable to a poultice of mashed carrots with charcoal. For old grease some slight stimulant must be added, as a little yeast or the grounds of table beer.

There are two errors in the application of a poultice, and particularly as it regards the legs. It is often put on too tight, by which the return of the blood from the foot is prevented, and the disease is

increased instead of lessened; or it is too hot, and unnecessary pain is given, and the inflammation aggravated.

POWDERS.—Some horses are very difficult to ball or drench, and the violent struggle that would accompany the attempt to conquer them may heighten the fever or inflammation. To such horses powders must be given in mashes. Emetic tartar and digitalis may be generally used in cases of inflammation or fever; or emetic tartar for worms; or calomel and even the farina of the Croton nut for physic: but powders are too often an excuse for the laziness or awkwardness of the carter or groom. The horse frequently refuses them, especially if his appetite has otherwise begun to fail; the powder and the mash are wasted, and the animal is unnecessarily nauseated. All medicine should be given in the form of ball or drink.

RAKING.—This consists in introducing the hand into the horse's rectum, and drawing out any hardened dung that may be there. It may be necessary in costiveness or fever, if a clyster pipe cannot be obtained; but an injection will better effect the purpose, and with less inconvenience to the animal. The introduction of the hand into the rectum is, however, useful to ascertain the existence of stone in the bladder, or the degree of distention of the bladder in suppression of urine, for the bladder will be easily felt below the gut; and at the same time by the heat of the intestine, the degree of inflammation in it or in the bladder may be detected.

RESIN.—The yellow resin is that which remains after the distillation of oil of turpentine. It is used externally to give consistence to ointments, and to render them slightly stimulant. Internally it is a useful diuretic, and is given in doses of five or six drachms made into a ball with soft soap. The common liquid turpentine, is, however, preferable.

ROWELS.—The manner of rowelling has been described. As exciting inflammation on the surface, and so lessening that which had previously existed in a neighbouring, but deeperseated part, they are decidedly inferior to blisters, for they do not act so quickly nor so extensively; therefore they should not be used in acute inflammation of the lungs or bowels, or any vital part. When the inflammation, however, although not intense, has long continued, rowels will be serviceable by producing an irritation and discharge which can be better kept up than by a blister. As promoting a permanent, although not very considerable discharge, and some inflammation, rowels in the thighs are useful in swelled legs, and obstinate grease. If fluid is thrown out under the skin in any other part, the rowel acts as a permanent drain. When sprain of the joint or the muscles of the shoulder is suspected, a rowel in the chest will be serviceable. The wound caused by a rowel will readily heal, and with little blemish, unless the useless leather of the farrier has been inserted.

SALT, common.—See **SODA**.

SEDATIVES are medicines which subdue irritation, repress spasmodic action, or deaden pain. We will not inquire whether they act first

as stimulants; if they do, their effect is exceedingly transient, and is quickly followed by depression and diminished action. Digitalis, hellebore, opium and turpentine, are medicines of this kind. Their effect in different diseases, or stages of disease, and the circumstances which indicate the use of any one of them in preference to the rest, are considered under their respective titles.

SILVER.—One combination only of this metal is used, and that as a manageable and excellent caustic, viz. the *Lunar Caustic*. It is far preferable to the hot iron, or to any acid, for the destruction of the part, if a horse should have been bitten by a rabid dog; and it stands next to the butyr of antimony for the removal of fungus generally.

SODA.—The *Chloride of Soda* is not so efficacious for the removal of unpleasant smells and all infection, as the chloride of lime, but it is exceedingly useful in changing malignant, corroding and destructive sores into the state of simple ulcers, and in ulcers that are not malignant it much hastens the cure. Poll evil and fistulous withers are much benefitted by it, and all farcy ulcers. It is used in the proportion of one part of the solution to twenty-four of water.

Common Salt (Chloride of Sodium) is very extensively employed in veterinary practice. It forms an efficacious aperient clyster; a solution of it has even been given as an aperient drink. Sprinkled over the hay, or in a mash, it is very palatable to sick horses; and in that langour and disinclination to food which remain after severe illness, few things will so soon recall the appetite as a drink composed of eight ounces of salt in solution. To horses in health it is more useful than is generally imagined, as promoting the digestion of the food, and, consequently, condition. Externally applied, there are few better lotions for inflamed eyes than a solution of half a drachm of salt in four ounces of water. In the proportion of an ounce of salt to the same quantity of water, it is a good embrocation for sore shoulders and backs; and if it does not always disperse warbles and tumours, it takes away much of the tenderness of the skin.

SOAP is supposed to possess a diuretic quality, and therefore enters into the composition of some diuretic masses. See **RESIN**. By many practitioners it is made an ingredient in the physic ball, but uselessly or even injuriously so; for if the aloes are finely powdered and mixed with palm oil, they will dissolve readily enough in the bowels without the aid of the soap, while the action of the soap on the kidneys will impair the purgative effect of the aloes.

STARCH may be substituted with advantage for gruel in obstinate cases of purging, both as a clyster, and to support the strength of the animal.

STOPPINGS constitute an important, but too often neglected part of stable management. If a horse is irregularly or seldom worked, his feet are deprived of moisture; they become hard, unyielding, and brittle, disposed to corn, contraction, and founder. The very muck of a neglected and filthy stable would be preferable to habitual standing on the cleanest litter without stopping. In wounds, bruises,

and corns, moisture is even more necessary to supple the horn, and relieve its pressure on the tender parts beneath. A common stopping, nothing is better than cow-dung with a fourth part of clay beaten well into it, and confined with splents from the binding of the broom, or the larger twigs of the broom. In cases of wounds a little tar may be added; but as a common stopping, it is too stimulating and drying. Pads made of thick felt have lately been contrived, which are fitted to the sole, and, swelling on being wetted, are sufficiently confined by the shoe. Having been well filled with water, they will continue moist during the night. They are very useful in gentlemen's stables; but the cow-dung and clay are sufficient for the farmer.

SULPHUR is the basis of the most effectual applications for mange. It is an excellent alterative, combined usually with antimony and nitre, and particularly for mange, surfeit, grease, hide-bound, or want of condition; and it is a useful ingredient in the cough and fever ball. When given alone, it seems to have little effect, except as a laxative in doses of six or eight ounces; but there are much better aperients. The black sulphur consists principally of the dross after the pure sulphur has been separated.

TAR melted with an equal quantity of grease forms the usual stopping of the farrier. It is a warm or slightly stimulant, and therefore useful, dressing for bruised or wounded feet; but its principal virtue seems to consist in preventing the penetration of dirt and water to the wounded part. As a common stopping it has been stated to be objectionable. From its warm and drying properties it is the usual and proper basis for thrush ointments; and from its adhesiveness, and slightly stimulating power, it often forms an ingredient in applications for mange; some practitioners give it, and advantageously, mixed with the usual cough medicine, and in doses of two or three drachms for chronic cough. The common tar is as effectual as the Barbadoes for every veterinary purpose. The oil, or spirit (rectified oil) of tar is sometimes used alone for the cure of mange, but it is not to be depended upon. The spirit of tar, mixed with double the quantity of fish oil, is, from its peculiar penetrating property, one of the best applications for hard and brittle feet. It should be well rubbed with a brush, both on the crust and sole, every night.

TINCTURES.—The medicinal properties of many substances are extracted by spirit of wine, but in such small quantities as to be scarcely available in veterinary practice for internal use. So much aloes or opium must be given to produce effect on the horse, that the quantity of spirit necessary to dissolve it would be injurious or might be fatal. As applications to wounds or inflamed surfaces, the tinctures of aloes, digitalis, myrrh, and opium, are highly useful.

TOBACCO, in the hands of the skilful farrier, may be advantageously employed in cases of extreme costiveness, or dangerous colic; but should never be permitted to be used as an external application for the cure of mange, or an internal medicine to promote a fine coat.

TONICS are valuable medicines when judiciously employed; but, like cordials, they have been fatally abused. Many a horse recovering from severe disease has been destroyed by their too early, or too free use. The veterinary surgeon occasionally administers them injuriously, in his anxiety to gratify the impatience of his employer. The mild vegetable tonics, chamomile, gentian, ginger, and, perhaps, the carbonate of iron, may sometimes be given with benefit, and may hasten the perfect recovery of the patient; but there are few principles more truly founded on reason and experience, than that disease once removed, the powers of nature are sufficient to re-establish health. Against the more powerful mineral tonics, except for the particular purposes that have been pointed out under the proper heads, the horse proprietor and the doctor should be on his guard.

TURPENTINE.—The common liquid turpentine has been described as one of the best diuretics, in doses of half an ounce, and made into a ball with linseed meal and half a drachm of ginger. It is added to the calamine or any other mild ointment to render it stimulating and digestive, and from its adhesiveness and slight stimulating power, it is an ingredient in mange ointments. The oil of turpentine is an excellent antispasmodic. For the removal of colic it stands unrivalled. Forming a tincture with cantharides, it is the basis of the 'sweating blister,' used for old strains and swellings. As a *blister* it is far inferior to the common ointment; as a stimulant frequently applied it must be sufficiently lowered, or it may blemish.

VINEGAR is a very useful application for sprains and bruises. Equal parts of boiling water and cold vinegar will form a good fomentation. Extract of lead, or bay salt, may be added with some slight advantage. As an internal remedy, vinegar is rarely given, nor has it, except in very large doses, any medicinal power. The doctor and the horse-owner should manufacture their own vinegar. That which they buy may contain sulphuric acid, and pungent spices, and irritate the inflamed part to which it is applied.

WAX.—The yellow wax is used in charges and some plasters to render them less brittle.

ZINC.—The impure carbonate of zinc, under the name of *Calamine Powder*, is used in the preparation of a valuable healing ointment. Five parts of lard and one of resin are melted together, and when these begin to get cool, two parts of the calamine, reduced to an impalpable powder, and stirred in. The calamine is sometimes sprinkled with advantage on cracked heels, and superficial sores.

The sulphate of zinc, *White Vitriol*, in the proportion of three grains to an ounce of water, is an excellent application in ophthalmia, when the inflammatory stage is passing over; and quittor is most successfully treated by a saturated solution of white vitriol being injected into the sinuses. A solution of white vitriol of less strength forms a wash for grease that is occasionally useful, when the alum or blue vitriol does not appear to succeed.

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