DISEASES OF THE HORSE AND THEIR TREATMENT.

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THE ADMINISTRATION OF MEDICINE TO THE HORSE.

Medicines are administered in various forms, and through different channels; the choice of the medium being controlled by the nature of the disease, convenience of administration, and whether the action of the medicine is intended to be general or local.

The mouth is the principal channel through which medicines are administered, "and they may be given in the form of powders, balls, drenches, or electuaries."

Powders are the most convenient form, as they can be mixed in the animal's food or drink; the principal drawback to this form of giving medicine is, that the choice of remedies is limited, as the animal generally refuses to take anything which is disagreeable either to its taste or smell. A bran mash is the best medium in which to mix a powder which is not readily soluble in water. Some horses, however, do not eat bran mashes readily; in such a case, it is better to either dissolve the powder, or mix it in a little water, and then mix it thoroughly with a feed of good forage finely cut up. A dry powder, thrown on dry food, is certain to be wasted.

Balls are the neatest and least troublesome method of giving nauseous or disagreeable medicines to horses, besides it has the great advantage that the exact dose can always be given. It is a great drawback to the proper treatment of horses in this Colony, that so few owners or attendants of horses can deliver a ball to a horse properly, as both the horse and his attendant very soon get tired of administering drenches, especially when they are of an irritating or disagreeable character. It is this trial to the patience and tact of the attendant, that has led to the barbarous practice, so common in this Colony, of pouring medicines down a horse's nostril; a most dangerous practice, and one frequently followed by fatal results.

Drenches should always be given by the mouth, and when they contain strong irritating drugs, they should be sufficiently diluted, or their irritating properties covered, by being mixed with some bland fluid, such as milk, linseed, or meal gruel, etc.

Electuaries are medicines mixed with some syrupy substance, or extracts, such as extract of belladonna, and similar products, which can be placed on the tongue, or fixed on the back teeth, when their local action on the mouth and throat are desired, or when it would be dangerous or disadvantageous to pour them down the animal's throat.

It is always unsatisfactory to treat wild and untrained horses, because they have generally to be caught, and thrown down, before any medicine can be given them, and the severe knocking about which they get in the process tends to do them more harm than the medicine is likely to do them good. It is this great disadvantage in the treatment of such horses which has led to the almost universal demand in this Colony of a heroic remedy, which will either kill or cure in one dose. With a little tact and patience, drenches may be given to trained horses with comparative ease. With quiet horses, all that is necessary is to get a strong assistant to hold up the head until the muzzle is a little higher than the poll, insert the neck of the bottle in the right cheek, placing it on the tongue as far back as possible but avoiding the molar teeth, and pour out the fluid, little by little, as the horse swallows it. Some more refractory animals require their heads to be held up by means of either a fork or by a rope thrown over a beam or drawn through a pulley. A loop is made on the end of a rope, this loop is drawn through the nose band of the halter, and then inserted into the horse's mouth immediately behind the upper front teeth; the nose band thus prevents the loop from slipping out of the mouth, should the horse draw his head suddenly back. The head may then be elevated, either by the prong of a wooden fork being inserted into the loop, or the end of the rope drawn through a pulley, or over a beam. Whichever plan is adopted, care should be exercised not to raise the horse's head too high; merely sufficient to prevent the medicine from running out of his mouth. Be ready to drop the head the instant the animal coughs. If this be not done, some of the fluid is liable to get into the lungs.

Tin bottles for the administration of drenches are now sold, but in the absence of one of these, a hock bottle will answer the purpose, one without a shoulder is the best, as the medicine runs out of it much better. Some horses are rather obstinate, and do not readily swallow fluid medicines; in such cases, by working the neck of the bottle in the mouth, or irritating the hard palate with the finger, you may succeed in making them swallow. Do not pinch the throat, as is commonly done, as it is liable to make the animal cough.

Balls may be given by means of a balling iron, or open gag, or by a balling gun, many of the latter are now used; they are much easier given without either of these instruments, however, when one has acquired a little practice in the art. Written directions are not of much value, unless one has an opportunity of seeing the thing done; the tongue is firmly grasped with the left hand, and drawn out as far as possible without injury, on the right side of the mouth; the ball is then firmly fixed between the first and second fingers of the right hand, the hand is flattened, and introduced quietly into the front of the mouth, then with a quick movement the ball is dropped at the back of the tongue, the hand is suddenly withdrawn, and the tongue being loosened at the same time, draws the ball back with it lodging it in the throat. If a ball is properly delivered, the horse is unable to return it, ex-

cept he coughs, which he should be prevented from doing by closing the mouth, and giving him a stroke under the chin with the fist should he attempt it. A drink of water, or a mouthful of forage, should be given immediately after, to assure the ball being swallowed.

The Lungs and Air Passages.—Medicines in the form of steam, gases, and medicated vapours are often administered by the air passages, in catarrhal affections, strangles, nasal gleet, and in parasitic affections of the lungs. "Steaming" a horse's head with medicated vapour is very satisfactorily accomplished by placing a bucket of boiling water, containing the medicine desired, into a large-sized sack, and inserting the horse's head into the mouth of the sack, leaving sufficient space to permit the patient to breathe fresh air along with the steam. The fumes of sulphur are frequently employed in cases of chronic catarrhal affections, by burning sulphur in a close stable; care must be exercised, however, not to allow the fumes to become too dense, or they will cause great irritation of the air passages, and do more harm than good. They should be regulated so that the animal can breathe them continuously for a considerable time, without great discomfort. This can always be ascertained by the attendant remaining for a time, at intervals, in the stable with the patient, if they are too strong for the air passages of the healthy attendant, they are too strong for the patient. Steaming the mucous membranes, like fomentations applied to the skin, require to be applied continuously for a considerable time, to do any real good. To steam a horse's head vigorously for half an hour only, and leave him standing in a cold, draughty stable for the rest of the day, is likely to do him much more harm than good. In like manner, to fasten a horse's head to the manger, and burn a shovelful of sulphur immediately under his nose, which is often done, is more likely to kill the patient than to cure him. I admit that the strong fumes of sulphur breathed for a few seconds may cause a horse to sneeze and expel the inflammatory mucus or pus, in cases of strangles, but they must not be continued longer than is necessary to accomplish the object in view.

Irritating powders, such as pepper and snuff, are often blown up a horse's nostrils to make him sneeze, and expel the inflammatory products. Antiseptic fluids are also injected up the nasal passages in cases of chronic nasal discharge, but the practice is not to be commended, unless it is carefully done with proper appliances.

The Skin.—Medicines are applied to the skin for their local effects, in inflammation, and various parasitic, and other skin affections. When applied over a large surface, they frequently produce their specific action on the system, through absorption, a matter to be constantly guarded against, where using a powerful remedy over a large surface of the body.

Hot and cold fomentations are the most effective external applications in all cases of local inflammation, but, as already remarked, they require to be continuously applied to produce their beneficial effects. To get the full benefit of hot fomentations, the part should be covered over with several folds of flannel, or similar

soft woollen material, to retain the heat. In applying hot fomentations to the body, in cases of inflammation of the organs of the chest, or abdomen, one method is to fasten a thick blanket firmly round the body, fixing the ends together over the back, by a packing needle and twine. The blanket should fit close to the body all round so that the air does not enter between the blanket and the skin. Hot water is then to be slowly and continuously poured all along the back, very little is required to keep up the heat after the blanket is thoroughly wet. To economise fuel, a small bath, or similar receptacle, may be placed under the horse's belly, to catch the hot water as it streams through the blanket and re-heat it. Another plan, and perhaps a better one, if properly applied, is to have two blankets; the one is dipped in boiling water, thoroughly wrung out, and applied firmly round the animal's body, the ends meeting over the back; the dry blanket is to be immediately applied over the other, in the same manner, and firmly fastened over the back by a needle and strong twine; sacks, or a large rug may then be thrown over the body, and the legs encased in flannel bandages. Hot bandages may be applied to any injured part of the limbs in a similar manner, by first applying one flannel bandage, thoroughly wrung out of boiling water, and one or two dry ones over it; renewing them as often as is necessary to keep up the heat. When the local pain is acute, soothing medicines, such as aconite, opium, or belladonna, may be applied to the part along with the fomentations. In the early stages of any injury, before inflammatory effusion has taken place, or rather formed in the part, cold is of the greatest service, if it can be continuously applied. Cold relieves the pain and reduces the inflammatory action, by causing contraction of the arteries which convey the blood to the part, and thereby relieves the tension of the inflamed vessels. If it is applied early, and kept up continuously, it may arrest the inflammatory action before any serious tissue change has taken place in the part. But if matter has once formed in the part, hot fomentations or poultices should be immediately substituted, and the ripening of the abscess hastened as much as possible. Hot fomentations or poultices allay inflammation and relieve pain just as well as cold do, only in a different way; cold relieves the tension of the inflamed vessels by diminishing the amount of blood supplied to them, while heat relieves the inflamed vessels by dilating the small blood vessels surrounding the inflamed part, and thereby withdraws the excess of blood from the inflamed vessels.

The Rectum.—Medicines are administered in the form of enemas, when their local action is desired to empty the back part of the bowels, and for the destruction of worms situated in the large intestines. Medicines are also administered by the rectum when their general effects are wanted in such diseases as tetanus and other nervous disorders, when it is neither practicable nor desirable to give them by the mouth. Enemas are of great benefit in the majority of diseases, or derangements of the digestive organs, and in cases of coma, volatile stimulants may be administered by the rectum when it would be dangerous to give anything by the mouth.

Strong, powerful remedies, which require to be administered in small doses, are often injected under the skin and into the veins by means of small hypodermic syringes, but these methods of administration, although largely used by professional men, require so much care and exactitude in the measurement of the doses, that they can hardly, as yet, be recommended to the ordinary farmer.

It cannot be too strongly impressed upon the minds of horse owners generally, however, that the medicines administered may be the most suitable, and may be given in the manner most applicable to the disease, and yet the patient may derive little or no benefit from them, for the want of proper care and attention. Pure air, pure water, sound, wholesome food, and cleanliness. are even more essential to a patient than medicine. In all diseases of the air passages, pure air, and comfort, are of the first importance, and nothing is more detrimental to such a patient than to confine him in a close, dirty stable. Similarly a suitable change of diet is of the utmost advantage in the treatment of all cases of derangement of the digestive organs, and it requires no arguments to prove that proper grooming or a thorough cleaning of the skin, is the best preventive as well as cure of all skin affections.

THE DIETING OF SICK HORSES.

The appetite if the sick horse is usually fastidious, and every means should be adopted to induce him to take sufficient nourishment. An endeavour should always be made to induce the patient to take his food voluntarily in preference to forcing it on him; so taken it is of infinitely more value. The practice of unnecessarily forcing food on a sick animal by means of drenching with gruels, etc., is in most cases to be condemned; not only does food administered in this way frequently annoy and distress the patient, but it may also cause derangement of the digestive organs and still further increase the distaste for food.

In all serious diseases, the digestive functions are more or less impaired, and consequently it is necessary that food should be given with especial care and in an easily digested form. In many complaints accompanied by a febrile condition the ordinary articles of diet, even if taken voluntarily by the patient, may be imperfectly digested and assimilated, and are liable to produce or aggravate gastric derangement. Animals suffering from such disorders, therefore should invariably be restricted to easily digested mashes and gruels; extra nutritive value can be given to these, as required, by the addition of milk or eggs.

It is important to note that food should never be allowed to lie long before a sick animal. If not soon eaten it should, without exception, be speedily removed, and replaced in two or three hours by a fresh supply. It is always advisable to administer small quantities of food at frequent intervals rather than to give larger quantities with long periods of fasting between them; "little and often" is the rule.

Again, during recovery from attacks of any debilitating disease, the patient should be fed on small quantities of easily digested

food; it is obvious that under these conditions the animal will require food more frequently than when in ordinary good health.

It often happen that with returning appetite the convalescent may be somewhat greedy and inclined, perhaps, to eat more than he can digest; care must be taken to prevent this; the golden rule "little and often" is here again the indication.

On those occasions in which, during the course of a debilitating disease, the patient's appetite has entirely ceased, and where all methods of coaxing have entirely failed to induce him voluntarily to partake of food. it will be advisable to give nourishment in the form of drenches consisting of milk, combined, if necessary, with eggs, and perhaps a little brandy—a wine glass or so—added by way of a stimulant. Here again only small quantities should be given at one time, and great care must be exercised to prevent fluid administered in this manner from "going the wrong way," *i.e.*, from entering the windpipe and so passing to the lungs, with the probability of producing a fatal mechanical inflammation of the bronchial tubes and lungs—the so-called "drenching pneumonia."

Water.—A supply of cold water should always be within reach, this is very necessary to the well-being of the patient. Unless when affected with diarrhœa, dysentery, or diabetes, it is rare indeed that animals injure themselves by taking too much water or watery fluids, but, on the other hands, they are often rendered very uncomfortable when it is unduly withheld from them, as is done so frequently by the attendant under the mistaken idea that a supply of cold water may be harmful.

Occasionally, as in the case of intestinal affections, it may be necessary to "take the chill off" by the addition of a small quantity of warm water before placing the fluid before the patient.

Bran Mash.—This is a very well-known article of diet for sick horses. Its nutritive value is not very great, but it has a distinct laxative effect, and is therefore often useful.

A bran mash should be prepared in the following manner:—Procure a clean stable bucket and scald it out by pouring in a little warm water, and then throwing it out again. Now place in the clean scalded bucket about three pounds of bran and a dessert to a tablespoonful of common salt; pour on about three pints of boiling water, stir it up well from the bottom with a clean stick, finally cover the bucket with a cloth, and allow the mash to cool. In twenty minutes or so, when sufficiently cool, the mash may be placed in front of the animal. If left standing in the manger bran mash speedily "sours," therefore, as soon as the animal has eaten as much as he requires, the remainder should be promptly removed.

Bran and Linseed Mash.—Boil slowly for two or three hours 1 pound of linseed and 3 quarts of water. Add 2 pounds of bran and a dessertspoonful or tablespoonful of salt, stir thoroughly with a clean stick, cover with a cloth, and place before the animal when cooled sufficiently. This jelly-like mash forms a very acceptable article of diet, and has a distinctly nutritive and laxative effect.

Linseed Tea.—Half a pound of linseed should be boiled in a gallon of water until the grains are quite soft. This form a nutritious and laxative adjunct to the sick dietary, and is often very useful.

Oatmeal Gruel.—Place half a pound of oatmeal in half a gallon of cold water, boil, stirring well the while. "Simmer" over a slow fire until sufficiently thick.

Hay Tea.—Fill a clean and previously scalded stable bucket with old hay, pour on boiling water, cover with a cloth, and allow to stand until sufficiently cool, when the "tea" should be carefully poured off. Many horses will readily take this fluid.

Scalded Oats are useful during convalescence, when they are often readily taken in preference to other articles of diet.

Milk is a food of great value in all cases of sickness. Many horses will drink milk quite readily, especially if a little water and sugar has been added to it. Milk is especially useful in cases where solid food cannot be taken, or where the use of solid food is not advisable. The vessels used to contain this article of diet must be kept scrupulously clean.

Grass—or the so-called artificial grasses, such as Lucerne—are useful foodstuffs, but only small quantities should be given at one time. Cut and carried to the sick box, green food is often of marked benefit in tempting the appetite, and it has distinctly cooling and laxative effects.

Carrots are very beneficial for sick horses, often inducing appetite when mixed with other food. In effect their action is slightly diuretic and laxative. They should be given whole or sliced lengthways (never across,—if cut transversely they may induce "choking").

These, then, are some of the foodstuffs commonly utilised for the sick horse. Others, however, are occasionally used. It is better to avoid, as far as possible, the use of boiled or cooked foods, as they not infrequently have a tendency to induce flatulence and indigestion. In the majority of cases one or other of the above-mentioned articles of diet will be found to answer all the ordinary requirements of the sick horse.

SPECIAL OR SPECIFIC DISEASES.

AFRICAN HORSE SICKNESS.

This is a disease affecting Equines—horses and mules especially—and occurring, as far as is at present definitely known, in Africa only.

Nature of the Disease.—Without attempting to give anything like an exhaustive account, horse sickness may be defined as an infective disease of the equine tribe, and characterised by acute congestion, with a tendency to the rapid effusion of a sero-albuminous fluid into the serous cavities of the body, such as the abdomen, the thorax, the pericardium, and the cranial cavity. Effusion of a similar nature is found in the cellular and mucous

tissues throughout the body, but more particularly in the lungs and bronchial tubes, in the bowels, and in the cellular tissues about the head, neck, and chest. This is accompanied by rapid rise of temperature to 104 or 105 degrees—sometimes even 106 degrees—and by great nervous prostration.

Varieties of Horse Sickness.

The disease manifests itself usually in one or other of the following forms:—

1. The Pulmonary form, in which the lungs are the only organs seriously affected.
2. The "Dikkop" form, in which the head swells up very much,—a variety of this, in which the tongue and lips become of a purple colour, is known as Blaauwtong.
3. The Gastro-intestinal form, in which there is no marked disturbance of the breathing until towards the close, no swelling about the head, except a fullness in the temporal fossa (above the eyes).

Conditions under which Horse Sickness Arises.

Horse sickness is due to invasion of the body by a specific micro-organism,—this occurs in the blood and various organs of animals suffering from the disease. The causal organism is so extremely minute that it cannot be discerned by any of our modern microscopes—so very small is it, in fact, that it may be passed through a fine porcelain filter and yet retain its activity unimpaired—for one drop or more of blood so treated, if inoculated experimentally under the skin of a susceptible animal (horse), will invariably produce the typical disease. On the other hand, enormous quantities of Horse Sickness virus (blood or secretions of a sick animal) have failed to produce the disease when mixed with food or water and given to horses, or administered by way of the mouth. In the generally accepted meaning of the term horse sickness is not a contagious disease—a healthy horse may be placed in close contact with an affected one, and yet not contract the malady. How then is the disease naturally transmitted from the diseased to the healthy?

It is now generally believed that the virus of horse sickness is transmitted by some species of insect—in all probability by a mosquito.

The particular insect responsible would appear to be active only at night, and would seem to enter stables or buildings but rarely, preferring the open. Perhaps the presence of ammonia fumes in the stable (arising from the presence of decomposing urine) may account for the absence of mosquitoes from such buildings. Amongst horses stabled at night—from sunset to sunrise—the disease rarely makes its appearance.

Horse sickness is a disease of the hot and wet months—December to April or May—ceasing soon after the commencement of the first frosts.

In districts in which the disease is prevalent it is well known that "the earlier the commencement of the rains, the earlier does

horse sickness make its appearance. As a matter of fact, during the early development stages of the mosquitoes water is absolutely essential,—it follows, therefore, that the more plentiful the water, the more actively do the insects develop, and the earlier are they able to transmit the virus of horse sickness. A certain temperature is also necessary for their development. Hence it will be apparent that in every detail horse sickness occurs under conditions which appear favourable to the activity of the mosquito.

It is in low-lying places—river beds, swampy districts—where horse sickness especially prevails—places, again, in which mosquitoes are plentiful.

Although the disease but rarely appears on high mountains, it is not the general elevation above sea level which gives the immunity, but the *local* elevation above the surrounding country. It is due to the neglect of this fact that horses have succumbed to the disease on some of the most elevated parts of the Colony, but where horses have been kept constantly on the elevated plateaus and prevented from straying into adjoining valleys, they have invariably remained free from infection

Immunity.

After recovering from one attack of horse sickness animals have some degree of immunity; nevertheless, they may contract the disease a second time, although this may be uncommon under ordinary conditions. It has been observed especially when horses "salted" in one district have been moved to another, and this has been explained by the occurrence in different parts of the country of different *strains* of the same causal organism, but of degrees of virulence, varying in virulence in different localities; thus it will be readily understood that whilst an animal may have acquired immunity against a comparatively mild strain, this may not suffice to protect it when exposed to the influence of a more virulent one. However, an attack of horse sickness *does* confer on the subject after recovery a certain degree of immunity against subsequent infection, and second attacks—when such occur—are less likely to end fatally.

Consequently it would be distinctly advantageous if one could submit susceptible animals to a mild form of the disease, that is, of course, if one could hope for a reasonable prospect of recovery. This process has been accomplished by means of the inoculation of a small quantity of virus (blood from a case of horse sickness), at the same time injecting into the subject a dose of protective serum obtained from a salted animal which has been "hyperimmunized" or fortified by subjecting it to injections of virus in gradually increasing, and finally, very large quantities.

This method of protective inoculation by the simultaneous injection of immune serum and virus introduced by Theiler, the Government Veterinary Bacteriologist of the Transvaal, has answered remarkably well in the case of mules, but, unfortunately, for horses it is not quite so trustworthy, and requires to be still further perfected.

Symptoms.

It may be noticed that the horse is somewhat sluggish and has a dull appearance, the depressions above the eyes appear fuller

than natural; the lining of the eyelids appears congested, this symptom becoming very pronounced as the disease advances; in addition to the intense congestion, this membrane invariably shows the presence of a number of red or purple spots—often of quite considerable size. The pulse is quick—perhaps 60 or 80 beats per minute,—may be even 100 or more in fatal cases. In the early stage the body temperature, perhaps only 102 or 103 degrees, soon rises to 105 or 106 degrees. In the pulmonary or lung form of the disease, the symptoms appears suddenly and the progress of the disease is rapid. The horse stands with head depressed and muzzle slightly protruding—the respirations may be only 40 or so per minute at the commencement, but very soon increase. Frequently twenty or thirty minutes before death there is more or less a profuse discharge from both the nostrils of a pale yellow or white frothy fluid closely resembling draught ale with a good head on, but in the majority of cases this fluid does not escape from the nostrils until immediately after death, when it bursts out of the nostrils like froth out of a beer bottle. Before death the animal becomes uneasy, and moves about in a manner indicative of great distress, panting and gasping for breath, but he invariably remains on his legs, until he drops down dead, or to die within a very short time after.

Symptoms of the "Dikkop" Variety.

In this form the most noticeable symptom is swelling about the head, particularly of the lips and tongue, which become of a purple colour. The chief characteristic of this form of the disease is extreme nervous depression. The horse stands stock still in a perfectly listless manner, without exhibiting any prominent indication of either pain or distress. He will attempt to eat a little green food, but after slowly chewing it, he either retains it in his mouth unswallowed, or drops it out again. He is unable to masticate or swallow properly, although he appears inclined to feed. In some of these cases the animal becomes semi-comatose, and dies without a struggle. Of course, there are cases in which this variety of the disease progresses very slowly, lasting, may be, four or five days, the animal perhaps continuing to eat a little until near the end. In these cases the temperature begins to fall rapidly some hours before death.

Symptoms of the Gastro-Intestinal Form.

In the early stages of this form of horse sickness the only symptoms observed may be dulness and colicky symptoms—uneasiness and attempts to lie down. The depressions about the eyes are invariably distended and the membrane lining the eyelids injected and exhibiting a number of dark red or purple spots.

The pulse will be accelerated and weak. There is a catarrhal condition of the bowels and symptoms of dull, constant abdominal pain. At a later stage the pulse and breathing become quicker, the heart's action struggling, pulse sometimes rising to even 120 per minute. Usually death does not supervene so rapidly as in the pulmonary form.

Such are the three forms of horse sickness. They are not always distinct, however; in many cases one observes all three complications. In the acute pulmonary form, which runs its course very rapidly, the full force of the disease is centred in the lungs, and the animal dies of suffocation. In the purely "Dikkop" form the animal appears to die of nervous depression, but frequently there is some lung complication immediately before death. In the gastro-intestinal form, there is effusion with the heart sac and cranial cavity, causing failure of the heart's action and pressure on the brain.

In all three forms the horse will eat a little as long as he is able. The temperature in every case is elevated—where death is delayed and the temperature regularly recorded, a distinct evening rise will be noticed, whilst soon before death it may drop below normal.

Preventive Measures and Treatment.

The chief preventive measures consist in

(*a*) Keeping susceptible equines away from infection, and

(*b*) in fortifying them against the effect of the infective agent by the method of protective inoculation already mentioned.

The first measure is carried out by stabling the animals at night —working them only in the day time. If grazed on the veld, they must not be allowed out before the sun is well up and the veld dry. If kept outside day and night, they require to be kept on an elevated plateau and carefully prevented from entering any adjoining valleys or kloofs.

Properly constructed nosebags made of a very porous cloth and kept moist with carbolic acid solution or similar disinfectants, and placed on the horses' heads during the night time, is also considered effective as a preventive. The good effect of this measure would appear not easy of explanation; it has been considered that the fine skin of the muzzle may be especially vulnerable to attacks of blood-sucking insects, especially when the animal is grazing; the nosebag would, of course, prevent this.

It has also been recommended to burn litter outside the stable during the night; this would naturally tend to keep away blood-sucking flies. Various other preventive measures have been recommended at one time or another, but those just mentioned seem the more reliable.

In order to fortify the system of the animal against the infection, by the internal administration of some medicinal agent as a preventive, it is obvious that this agent would have to be given at frequent intervals in order to maintain its continuous action in the system. Many medicinal agents have power to prevent the development of disease germs when of a certain strength, that have no effect in destroying these germs after their development. Now, it is quite possible, nay, even very probable, that there are many germicides which would effectually prevent the multiplication and development of the germ of horse sickness within the system of the horse, if they could be given to the animal in sufficient quantity, and with sufficient frequency to maintain their preven-

tive action constantly. But here is the difficulty—there are few such agents which can be given to a horse continuously for a lengthened period without impairing the health of the animal. For instance, carbolic acid and the various tar derivatives are excellent disinfectants, and have great power in preventing the development of micro-organisms, but none of them could be given to an animal continuously without seriously impairing its health. At various times the internal administration of arsenic has been recommended. Arsenic may be given in small doses continuously for a lengthened period, with, in many cases, marked benefit. It should not be given by any one, however, who will not take the troublte to carefully measure the dose. The daily dose should be one fluid ounce of the liquor arsenicalis, this quantity containing about four and a half grains of arsenic. (For preparation of arsenical solution, see page 58.) Being practically tasteless, one may administer this agent by sprinkling it on the forage or mixing it with a little bran.

The effects must be carefully watched; should an animal whilst receiving arsenic show at any time swelling and redness about the eyelids, diarrhœa, or look dull or go off his food, at once stop the administration of arsenic for some days, and give bran mashes and green food—the symptoms will soon pass away. Do not give a large dose every week and expect that such a course will be either safe or effective as a preventive, although many people believe they have succeeded by giving the drug in this way.

Curative Treatment.

Cases of horse sickness have recovered under every variety of treatment, and, as would naturally be expected in such a rapidly fatal disease, numbers have died whilst under similar treatment. Stimulants may be indicated—with that object alcohol (brandy) and turpentine can be administered.

The brandy may be given in doses of "half a bottle," whilst turpentine in one ounce doses mixed in a cupful of milk can be given every three or four hours between the doses of brandy. In the pulmonary form blankets wrung out of boiling water and applied continuously to the body, sometimes have a beneficial effect. Injections of warm water may be required to relieve the bowels, and the patient should be allowed abundance of fresh air night and day. The body should be clothed and the legs bandaged.

Unfortunately it must be admitted that in the case of horse sickness the percentage of recoveries which may be ascribed to the administration of medicinal agents is extremely small.

EQUINE BILIARY FEVER.

This, a disease of horses, mules, and donkeys, is met with in Africa, India, Italy, Algiers, Madagascar and other countries. Individual cases occur all over the Colony, but the disease is most prevalent in the Cape Peninsula and along the east coast to about 100 miles inland, occurring at any season of the year, but being

most frequently encountered during the summer and autumn months.

In addition to the domesticated animals just mentioned, there is reason to believe the zebra is also subject to the malady, and acts as a "carrier" of the virus.

The term biliary fever no doubt was originally applied to designate this particular malady in consequence of one of the prominent symptoms exhibited by affected animals, viz.: a markedly yellow coloration of the visible mucous membranes, *i.e.*, the membrane lining the eyelids and lips. Biliary fever (technically known as equine piroplasmosis) is due to the presence in the red corpuscles of the blood of both affected and salted animals of a small parasite belonging to the animal kingdom and termed a "Piroplasm." This parasite is similar to, but by no means identical with, the micro-organisms which give rise to the disease "redwater" in cattle and malignant jaundice in the dog.

In all these diseases caused by a piroplasm (known collectively as the "Piroplasmoses") the casual organism is conveyed from animal to animal of the same species, by the agency of ticks. Notwithstanding the above statements it must be clearly understood that the three diseases—equine biliary fever, and redwater of cattle and malignant jaundice of the dog—are quite separate and apart from each other,—thus redwater of cattle cannot be conveyed to horses, dogs or in fact to any animals other than bovines—neither of course can malignant jaundice of the dog be transmitted to any animal other than canines—and neither can the biliary fever of the horse be transmitted to any animals other than those of the equine species.

In the case of the disease first mentioned (redwater of cattle) the common blue tick (*Rhipicephalus decoloratus*) acts as agent for the transmission of the virus; in the case of canine malignant jaundice another species of tick, the dog tick (*Haemaphysalis leachi*) is responsible, whilst in equine biliary fever, the red tick (*Rhipicephalus evertsii*) fulfils the role, taking up the infective agent (*Piroplasma equi*) in its nymphal stage and transmitting it when adult.

The tick obtains its supply of virus not only from animals actually suffering from the disease, but, strange as it may seem, also from salted ones, *i.e.*, those which have suffered from an attack of the malady and recovered, and which to all appearance may be in perfect health. Here we observe one of the peculiarities of this particular group of diseases (the Piroplasmoses). With the exception of only one disease of this type, *i.e.*, African coast fever of cattle—an animal after recovery from one attack of piroplasmosis still harbours the causal parasite (piroplasm) in its blood—the animal has merely acquired a tolerance to the presence of the organism, practically speaking it is immune, yet under adverse conditions this tolerance may break down, and the parasite once more gain the upper hand. In this way are explained relapses and secondary attacks of biliary fever.

Foals very rarely indeed die from the malady—whilst living on the veld the young equine becomes naturally infected and

"salted,"—consequently, as one would expect, the disease mainly occurs amongst imported adult animals.

Symptoms.

The horse appears dull and depressed, hangs his head; his breathing and pulse are accelerated and the body temperature high. When first observed, his temperature, perhaps 103 to 104 degrees Fahr., may rise to 105 degrees in the course of twenty-four hours. In severe cases the temperature may go up to 106 or 107 degrees Fahr. The appetite is more or less completely in abeyance. There is considerable thirst; the bowels are generally slightly constipated, the fæces have a pronounced yellow tinge and are covered with mucus. Very early the mucous membranes lining the eyelids acquire a bright yellow colour. A few red or purple spots or patches may be observed on this yellow membrane near the inner angle of the eye. The lining of the lips has also a yellow hue, but perhaps not quite so well marked. The horse may appear uneasy, changing the position of his hind legs frequently, whilst his breathing becomes quicker and accompanied with deep sighs, as from a feeling of oppression. In some cases there are symptoms of abdominal pain, especially when the bowels begin to move, as if the passage of the fæces irritated the tender lining of the bowels. The urine is sometimes darkly coloured.

Under proper treatment the temperature begins to fall about the third day, the bowels begin to act, the appetite returns, and the patient makes a rapid recovery, the attack leaving little or no signs of the disease behind it except, perhaps, a loss of condition.

Preventive Measures

As ticks are responsible for the transmission of the causal parasite of this disease, it would be a desirable measure if one could cradicate these pests throughout the entire country,—but since this, of course, is a very difficult matter, if not impossible, the next best course consists in exposing susceptible equines to the influence of the virulent agent when they are best able to withstand it—that is when they are young; therefore horses should be imported into infected areas at as early an age as possible.

Methods of Protective Inoculation.

The experimental inoculation of blood from an animal salted to biliary fever will invariably produce the disease in susceptible equines.

Mules can be immunised by inoculating them with blood from a salted mule, but in the case of horses disastrous results may follow the inoculation of blood obtained either from salted horse, mule or donkey. The donkey occupies an intermediate position in this respect, being susceptible to blood of salted horses and donkeys, whilst the injection of blood from immune (salted) mules is not without danger of producing a severe form of the disease and death.

Taking advantage of the known fact that in the disease "red-water" of cattle, the inoculation of adult cattle with blood de-

rived from a calf immune against red water, is not so frequently followed by death as when the blood is derived from a full-grown animal, Theiler, the Government Veterinary Bacteriologist in the Transvaal, has recently introduced a method of immunisation based on this fact. Having obtained virulent blood from a donkey which has naturally suffered from the disease (biliary fever), this is passed through foals and the blood of the latter used for the purpose of immunising susceptible equines against the disease. In the experiments so far conducted, this method appears to have been quite successful, and it will no doubt find its way into practice at an early date.

Curative Treatment.

This is generally satisfactory if properly carried out.

Give at once the following:—

Powdered chloride of ammonia	½ ounce.
Extract of belladonna	½ drachm.

Common mass sufficient to make a ball.

If given as a draught, the ammonia chloride and belladonna may be dissolved in a pint of warm water. This dose must be given, at least three times a day and continued. It is rare that it requires to be given after the second day. Six doses given at proper intervals are generally enough, but more may be necessary.

Drastic purgative medicine—aloes for example—should never be given in this disease, no matter how constipated the bowels may be.

Two to four tablespoonsful of sulphate of soda or sulphate of magnesia (Epsom salts) may be given in the drinking water (or as a draught combined with the above mentioned chloride of ammonia) twice or thrice daily until a slight laxative effect is obtained. Place the patient in a comfortable, sweet, airy stable, clothe the body well, and put flannel bandages on the legs. As the animal is generally thirsty, give him bran and water to drink, with the chill taken off, and any green food that may be procurable. Avoid a close, foul atmosphere, as well as draughty stables, and with the exercise of care and patience the case will invariably recover.

ANTHRAX, CHARBON, SPLENIC APOPLEXY, MILTZIEKTE, OR MALIGNANT PUSTULE.

This is a malignant infective disease, capable of being communicated to nearly all mammalian animals, including man.

Its originating cause is a little rod-shaped micro-organism called the Bacillus anthracis, which, when introduced into the blood of a healthy animal, multiplies there with great rapidity, producing grave changes in that fluid and congestion of various internal organs, especially the spleen, followed by death, in some patients within twenty-four hours.

Modes of Infection.—The bacteria may gain an entrance through a wound or abrasion of the skin, through an abrasion of the mucous membrane lining the mouth, or other part of the

digestive canal; or infection may take place through the lining of the intestinal canal, by swallowing the highly resistant spores or "seeds" of these bacteria, along with the food; or these spores may be contained in the dust of the stable, or mixed with dry food, and inhaled into the lungs, infecting the animal through that channel. Again, organisms may be carried by flies and other insects.

Symptoms of Anthrax.—There are two forms or varieties of this disease. In the one form there are no external swellings or eruptions on the body, it is the blood which is principally affected, and there is congestion of various internal organs, especially the spleen. The onset of the disease is sudden, and its progress rapid. The animal becomes excited, with quivering of the muscles, the breathing is quickened and distressed, and there is generally a little bloody coloured mucous discharge from the nostrils. The animal suddenly becomes weak, staggers, falls, and dies generally in convulsions, often within an hour from the time when it was first observed to be amiss. Very often the first evidence of the presence of the disease is the sudden death of one or two animals before they were known to be sick,—this form is called splenic apoplexy or miltziekte proper.

The other form of anthrax is characterised by external swellings or eruptions on different parts of the body, but most frequently on the lower parts of chest, abdomen, sheath, and around the anus. Some of these swellings are small, almost unnoticeable, but at times they cover the whole of the under-surface of the chest and abdomen; in some cases the head is enormously enlarged. The swellings are somewhat hard to the touch, and when opened emit a clear amber coloured fluid. The submaxillary, and large lymphatic glands are generally slightly swollen. The pulse is quick and weak, but the heart's beat is struggling, and the temperature high, from 105° to 107° Fah. This variety of anthrax is most frequently seen in the horse in this Colony, the great majority of the cases which occurred in an outbreak in the Griqualand West districts took this form—called malignant pustule, the result of cutaneous inoculation. It is called gift-ziekte by the farmers, and is often seen in cattle also in that territory.

Treatment.—Internal anthrax, or splenic apoplexy, runs its fatal course so rapidly in the lower animals that there is very little time or opportunity for curative treatment. Almost the best thing to do with such cases, as soon as they are recognised, is to get them removed from the rest of the herd to the burial ground, so as to prevent the further dissemination of the germs of the disease in the byre or pasture. In cases that linger for some time, experience points to repeated doses of carbolic acid as about the most hopeful remedy to try.

In dealing with an outbreak of anthrax in the Kimberley district, Mr. Borthwick found most benefit from the administration of a laxative such as a pint of raw linseed oil, followed by carbolic acid, 40 to 60 drops, chlorate of potash a tablespoonful dissolved in a bottle of water, and given twice a day. Unless the swellings were very large he did not open them, but injected by

means of a hypodermic syringe, 1 to 2 drachms of pure carbolic acid, immediately around the edges of the swelling. Out of 25 cases so treated, 20 recovered.

Preventive Measures.—On the occurrence of a case of anthrax the unaffected animals should immediately be removed from the tainted pasture or water, if such be detected. All infected animals should be immediately removed from the veld where the other stock graze, so as to avoid contaminating the pasture through the discharges from the bowels.

As a means of checking the development of the disease in those which may already have become inoculated, drachm doses of carbolic acid may be given, well diluted in water, twice a day.

Owners of stock situated in localities where anthrax causes considerable annual loss should resort to Pasteur's method of vaccination, injecting under the skin by means of a syringe the two vaccines (1st and 2nd) issued for that purpose.

The weaker or 1st vaccine is first injection, and this is followed after an interval of ten to fourteen days, by an injection of the 2nd or stronger vaccine.

Ten days to one month after receiving the second vaccine, the animal will have acquired an immunity against anthrax sufficient to protect it against the ordinary methods of infection for a period of about twelve months.

From this it follows that in districts ravaged by the disease, this method of artificial immunisation should be repeated each year.

In disposing of the carcases of animals which die of anthrax, the following directions should be carried out as far as possible:

(*a*) It is very important that *the carcase should not be opened or the skin cut*, unless for the purpose of professional examination, and then it should be done at the mouth of the grave, so that every particle of the blood which escapes during the operation may be deposited in the bottom of the grave with the carcase.

(*b*) All such carcases should be cremated or properly buried in some isolated or enclosed spot where stock do not graze, but if there are no such corners handy, a dry gravelly soil should be selected for the grave; these carcases should never be buried in the rich, deep, loamy soil of meadows, vleys, or the borders of streams. In such situations worms are generally very active at a considerable depth, and it has been shown that these annelids may bring up the spores to the surface of the soil in their casts, where they germinate during the heat of the summer months, and thereby contaminate the pasture.

(*c*) If the soil be suitable, the carcase should be buried as near to where the animal died as possible, but if it has to be conveyed some distance, it should not be dragged on the ground, as such a method tears the skin and would be liable to leave the infectious germs along the track. The carcase should be placed on planks or bushes, and conveyed on these without touching the ground, and to prevent the escape of any bloody discharge from any of the natural outlets of the body in its passage, these should be plugged with grass or similar substance.

(*d*) With respect to the grave itself it should be of sufficient depth to allow five feet of earth to be above the carcase, and the latter should be covered with quicklime several inches thick. A similar dressing should be applied to the portion of veld where the carcase lay, and if the animal died in a stable, the bedding and manure should be burned, and the place cleansed and disinfected by the application of boiling water and solutions of carbolic acid in water (one in twenty), Jeye's fluid, Izal or other disinfectant.

GLANDERS AND FARCY.

Glanders and Farcy are essentially one and the same disease, differing only in that glanders manifests itself principally in the lungs and air passages, while farcy appears on the skin and superficial lymphatic glands.

Cause.—Glanders is a contagious disease caused by a special virus, a living micro-organism. This is its sole originating cause. The disease does not rise spontaneously under any known conditions, neither can any other disease of the air passages develop into glanders however much neglected.

The infective material of glanders is contained in the discharge which flows from the mucous membrane of the air passages of affected animals. It is also contained in the fluid contents of the ulcers in cutaneous glanders or farcy, in the glanders nodules in the lungs, and in glanderous lesions occurring in any part of the body. The blood does not contain the virus ordinarily, and experimental evidence shows that it is not contained in the breath of an affected animal if there are no local lesions, even if that animal contains glanders tubercles in its lungs. Those who believe that infection takes place through the respiratory organs are of opinion that the infected material which is discharged from the nostrils becomes dry and is then inhaled by healthy susceptible animals in the form of dust particles. It may be taken in with the food in any form, moist or dry, and there is little doubt that the usual mode of infection is by way of the digestive tract.

Glanders may therefore be transmitted from an affected to a healthy animal, directly or indirectly. Directly, by close contact of an affected with a healthy animal; or indirectly through healthy animals eating out of the same manger or drinking out of the same bucket that has been used for a glandered horse. The stable walls, stalls, floors, bedding and utensils may also be mediums of infection, as horses are very liable to lick or chew any of these and thereby ingest the virus; and if the infection is liable to be inhaled along with particles of dust when the stable is being swept, it points to the necessity of thoroughly cleaning and disinfecting the floor, as well as the walls, stalls and mangers.

Although essentially an equine disease, affecting horses, mules, donkeys and jennets, glanders is readily communicated to man, to the dog and cat, and to certain other animals, by inoculation, either experimentally or accidentally performed.

In nearly every case where glanders has occurred in man, the infection has been derived from a glandered horse, mule or ass by the infective discharges of the latter having accidentally gained

contact with a wounded or abraded surface on the human subject. When dealing with suspected equines, therefore, the attendant must exercise great care; his hands should be thoroughly cleansed immediately after handling such animals. In the human subject glanders invariably takes a fatal course.

Symptoms.—The first observable symptom is generally a slight discharge, most frequently from one nostril only, but it may be from both. This discharge increases, is of a bluish yellow colour like finely made thin starch, and is of an adhesive character, sticking to the edges of the nostrils. The lymphatic glands inside the lower jaw become swollen and hard, and show no tendency to ripen or come to a head, even though a severe blister may be applied to them. If the inside of the nostrils is carefully examined, little greyish, red or yellow elevated pimples will be seen, which soon break down and become converted into ulcers often covered with a crust. The mucous membrane lining the nostrils presents a purplish colour, and not the pink colour of health. These symptoms become aggravated, the ulcers become deeper, coalesce, and in some cases a large hole is ulcerated right through the cartilage dividing the nostrils, the discharge from the nostrils, in such cases, becomes bloody. In some cases the mucous membrane may seem almost completely covered by the ulcerous-looking tissue. The animal appears unthrifty-looking, hidebound, the eyes red and weeping, and there is a snuffling sound in the nostrils when breathing.

The foregoing will serve to describe acute glanders as occurring either in horses, mules or asses. In the ass this is the form invariably encountered.

But in many cases of glanders of horses in this Colony the disease assumes a chronic form, the animal appearing in perfect health, with the exception perhaps of a discharge from the nostrils and swollen glands inside the lower jaw. He may feed well, do his work well, and look sleek and fat. These are the cases which if allowed to live may infect the whole of the horses in a stud. Other cases may present a general unthrifty appearance; there may be chronic thirst with or without cough or discharge from the nostrils.

In all cases where there is a sticky, starchy-looking discharge from the nostrils, a hard swelling of the glands inside the lower jaw, with yellow pimples or small ulcers on the membrane lining the nostrils, no hesitation should be entertained regarding the nature of the disease. Even before any pimples or ulcers appear in the nostrils, if a discharge commences from the nostrils without any appearance of a cold, sore throat, or strangles to account for it, it is always suspicious, and the animal should be isolated at once. Horses affected with chronic glanders may live two or more years if they have plenty of food, and are not overworked. Hard work, insufficient food, and exposure, generally cause the disease to assume an acute and rapidly fatal form.

NOTE.—The symptoms here mentioned should be carefully compared with those of nasal catarrh (see page 37) and strangles —nieuw ziekte (see page 23), as those diseases have been mis-

taken for glanders on more than one occasion by the inexperienced. Likewise the following symptoms of farcy or cutaneous glanders should be compared with those of epizootic lymphangitis (page 22) purpura hæmorrhagica (page 30) and lymphangitis (page 35.)

Symptoms of Farcy.—The lymphatics inside the fore or hind legs, or along the side of the neck or body are swollen, and feel like thick cords, very painful to touch; small round swellings appear on the course of these cords, which ultimately burst, and discharge a yellow glary fluid, leaving raw, ragged sores. There is generally a diffused swelling of the affected limb also. In many cases the farcy buds may form in an irregular manner, around the fetlock joints or in other situations of the body. Acute farcy generally ends in glanders, and acute glanders not infrequently breaks out in farcy buds all over the body, if the animal is allowed to live long enough.

Suppressive Measures.—In order to deal effectively with outbreak of glanders, with as little loss as possible to the owner, every horse which has a suspicious discharge from the nostril should be immediately isolated until the nature of the discharge can be definitely ascertained. As soon as the case is decided to be one of glanders, it should be immediately destroyed, and all the incontact animals submitted to the mallein test. Should any of these give a decided reaction to the test, they should be either destroyed or completely isolated from the others without delay. If there are only one or two re-actors in a stud, and no convenient arrangements for complete isolation can be made, it is much more economical and satisfactory to the owner to destroy these immediately, and under any circumstances, unless the re-actors are of considerable value, it rarely pays the owner to keep them, as the chances are ten to one that they will ultimately develop visible glanders.

Disinfection.

Before the originating cause of glanders—the bacillus mallei —was discovered, and its vitality experimentally ascertained, the popular opinion was, that the infective agent of glanders was one of the most difficult to kill and eradicate from infected premises. This opinion arose from the fact that it proved so difficult then, with the means at our disposal, to eradicate the disease from a stud of horses in which it had got established. But this difficulty was not due to the unusual vitality of the infective agent of glanders, but to the slow and irregular development of the disease in the lungs and other tissues of the infected animal. We had no definite means then of distinguishing those latent cases in which the disease was confined to the lungs, but the animal manifested no outward indication of its presence. Such animals were, therefore, left in the stud, and were the means of perpetuating the disease. The apparent failure to destroy the infective agent of glanders by every known method of disinfection was, therefore, due to the impossibility of eliminating every affected animal from the stud, and not to the indestructibility of the infection itself. With the discovery of mallein, and its proved diagnostic value,

all this is changed, and it is now an owner's own fault if he leaves any infected animal in his stud after the indication given by the mallein test.

With respect to the vitality of the bacillus mallei, it is as easily destroyed as many other pathogenic organisms. According to Loffler, it may live three months in a dry condition, but the majority of authorities find that it dies in ten days when exposed to sunlight. It may, however, remain active a long time in a dark closed stable.

A temperature of 212 degrees Fah. kills the bacillus at once, and 176 degrees kills it in five minutes.

Exposed to the action of corrosive sublimate 1 in 1,000, the bacilli are killed in fifteen minutes; and in a 5 per cent. solution of carbolic acid, Jeyes' fluid, etc., in an hour. *It will be observed, therefore, that boiling water and sunlight are two of the most efficient, as well as the most economical disinfectants.

All the woodwork, stalls, mangers, etc., of an infected stable should be scoured with caustic soda and hot water, to remove the glutinous discharges which are very adhesive. The walls and floors should be thoroughly washed with boiling water, in which 5 per cent. of carbolic acid, Jeyes' fluid, etc., or similar disinfectant is added; or one ounce of corrosive sublimate dissolved in six gallons of hot water. The latter is the most efficient disinfectant, but, as it is a strong poison, it requires to be used with care. All rugs, bandages, and similar articles can be steeped in boiling water containing the disinfectant. Harness cannot be placed in boiling water, but it may be thoroughly cleaned with warm water, containing a disinfectant, and soap.

All bedding and manure should be burned. If it is impracticable to burn the latter, it should be disinfected, or thoroughly mixed with quicklime. If an infected stable is clean and disinfected in the above manner, and thoroughly exposed to the sun and dry air, fresh healthy animals may be introduced without danger, care being taken to prevent any suspicious animal from being introduced with them.

Mallein is simply the product of growth of the glanders bacillus. This material is prepared by growing the organism in the laboratory on special culture medium, this being finally subjected to heat to kill the microbes, which are subsequently entirely removed by filtration through porcelain. Mallein, then, is the product of growth *only* of the glanders bacillus—it is free from the presence of any micro-organism and is consequently totally incapable of originating the disease, or of producing any deleterious effect when inoculated into animals.

Mallein is used for the diagnosis of glanders, and its discovery has completely changed our methods of dealing with that disease. Before mallein was available, the diagnosis of many cases which presented only suspicious symptoms was most difficult, whilst the detection of those latent cases, in which there are no visible symptoms, was impossible. With the aid of mallein, the diagnosis of such cases is now an easy matter, and practically certain when it is used with skill and judgment.

(*) This allows an ample margin of safety. As a matter of fact it requires only a few minutes exposure to these disinfectants to destroy the glanders bacillus.

EPIZOOTIC LYMPHANGITIS.

This is a contagious disease due to the presence in the lymphatics of a specific organism, the Cryptococcus farciminosus, a microscopic ovoid body with a double-contoured envelope, and a highly refractile contents.

It is very probable that a large number of cases of this disease were introduced during the late campaign, and the presence of these infected animals amongst the large troops of horses which were congregated together in the military and concentration camps, led to its rapid spread and wide distribution throughout the Colony when the military horses were finally disposed of. In fact, this is what did occur, for the officers of this department met with numerous cases of the disease all over the Colony after the close of the war.

Mode of Infection.—The general opinion of all observers is that the disease is due to local infection, and shows itself in the region of a pre-existing wound or abrasion of the skin after an incubative period of from eight days to five or six months The susceptible animals are the horse, mule and ass. The mule is particularly susceptible.

Symptoms.—In appearance the disease closely resembles cutaneous glanders (farcy), but may be readily differentiated from the latter by the application of the mallein test (this of course will produce a re-action only in animals suffering from glanders) and further by microscopical examination of the pus from the lesions (pustules and ulcers); if the case be one of epizootic lymphangitis, the causal organism (cryptococcus) will be readily detected by the expert.

Animals affected with epizootic lymphangitis show swelling of the lymphatics, vessels and glands, frequently on one of the limbs although any other part of the body may be affected; the lymphatics appear corded as in farcy, nodules appear on their course, these finally burst and discharge a thick whitish or yellowing creamy pus, sometimes oily. Afterwards the suppurating point persist as small ulcers or buds with raised thickened edges which constantly discharge a yellowish sticky exudate. The disease slowly extends, invading the adjacent lymphatic glands and sometimes even the internal organs.

In this disease it is not usual to observe any appearance of general ill-health, emaciation and loss of appetite are noticed only in far advanced and badly neglected cases.

Treatment.—It is of the utmost importance to successful treatment that every diseased lymphatic should be laid open as far as the diseased action extends, their morbid contents cleared out, and the part thoroughly dressed with a strong caustic and antiseptic such as carbolic acid. The first application must be very thorough, subsequently dressings being applied, either a solution of carbolic acid, corrosive sublimate, Lysol, iodine, copper sulphate or some other disinfectant.

Some commence treatment by destroying the diseased tissue by means of the actual cautery (hot iron).

Internally, tonics and antiseptics may be administered; it is claimed that marked benefit has followed systematic dosing with the salts of mercury and iodine, but whether or not this course is followed, the local treatment as above recommended must on no account be neglected.

Preventive Measures.—It is of the utmost importance, immediately on the occurrence of an outbreak of this disease, that all affected animals be rigidly isolated, and the stable, harness, rugs, bandages, grooming utensils, in fact everything that may have been in contact with such animals, be thoroughly disinfected. Wounds should be treated antiseptically, thus preventing their infection with the specific organism, and, as there is reason to believe that flies frequently act as agents for its transmission, one should endeavour to eliminate these pests as far as possible. By one well-known authority a mixture of creosote, turpentine and oil is strongly recommended as a dressing—it is said that flies will not go near this, and wounds so dressed during the occurrence of an outbreak of epizootic lymphangitis ought never to become infected.

"STRANGLES" OR "NIEUWZIEKTE."

This is an infective febrile disease of horses, mules and donkeys, manifested by catarrhal inflammation of the upper air passages, and usually attended by the formation of an abscess or abscesses about the throat, generally between the branches of the lower jaw. These abscesses may, however, form in any part of the body, frequently in some of the internal organs: when they do so the disease is termed irregular or complicated strangles.

Cause.—The infective agent is micro-organism—a streptococcus—and this is found in the nasal discharge and pus obtained from the abscesses in the lymphathic glands.

Examined through the microscope the organism occurs in more or less long chains, like strings of beads.

Mode of Infection.—The infection of strangles takes place usually through the mucous membrane of the respiratory organs, but it may enter through the intestinal mucous membrane; it may also enter through any abrasion of the skin, or be introduced experimentally through the same channel by inoculation. Young animals are most susceptible to infection, but it may occur in animals of any age which have not been previously affected. Other predisposing causes are any disease of the respiratory passages,—such as a common cold,—which produces a condition of the mucous membrane more favourable for the reception of the streptococcus.

The Persistency of the Contagion.—The infective agent of strangles appears capable of living for a considerable time outside the animal body, hence thorough disinfection of stables should always be carried out after an outbreak of strangles. It is due to this persistency of the infection in the stables of large companies and extensive breeding establishments, where young susceptible horses are being continually introduced, that these fresh horses invariably contract strangles shortly after their introduc-

tion. This is usually attributed to the change of stabling, food, etc., but it is mainly due to the infection remaining in the stables.

Symptoms of Ordinary Strangles.—Strangles commences like a common cold, the animal is dull and feverish, with a temperature of 104° Fah., or over. The nasal mucous membrane presents a congested catarrhal appearance; there is a soft sneezing cough, soreness of the throat, and a difficulty in swallowing. The appetite is impaired, and in the large majority of cases, a swelling of the submaxillary glands appears, accompanied by a discharge from the nostrils. This discharge is at first serous and viscid, but it soon becomes purulent. Its colour may vary from a dirty white to a yellowish green, the latter being largely influenced by green food, the juice of which passes back through the nostrils. In young animals the discharge from the nostrils is generally abundant, whereas in aged horses it is often very slight. As a rule, in the ordinary cases of strangles, as soon as the abscess bursts or is opened, the temperature falls, the swellings rapidly disappear, and the cavity heals up by granulation.

The local swelling of the glands and their surrounding connective tissue may increase in size until the whole of the space between the two branches of the lower jaw becomes filled, and the swelling may even extend behind the posterior branches of the jaw. In some cases the deeper seated glands of the pharynx (throat) and surrounding tissues become inflamed, and the consequent swelling may press so hard against the opening of the larynx (entrance to the "windpipe"), that breathing becomes difficult or even impossible, and, unless relief be given, the animal will die of suffocation. In by far the greater number of the ordinary cases of strangles the swelling goes on to the formation of abscesses, wherever its situation may be. The formation of an abscess is indicated by one or more soft spots appearing in the swelling. These are at first doughy to the touch, but they soon become distinctly fluctuating, indicating the presence of fluid. The skin over these spots becomes thin, the hairs fall out, and the abscess points, bursts, and discharges a thick yellowish-white creamy pus.

The deep-seated glandular swellings usually terminate in suppuration in the same manner, but they may burst inwards into the throat or mouth, or they may open partly inwards and partly outwards, and thus cause a fistulous opening.

In some cases the abscesses become indolent and "ripen" very slowly, while in others the fluid matter may become partly absorbed, and set up septicaemia or pyaemia, which is usually followed by multiple local abscesses, or the appearance of abscesses in different organs and tissues of the body, the virus being carried by the lymphatics and blood vessels. When this occurs it is called

Irregular, Complicated, or Malignant Strangles.

In such cases abscesses may appear in any organ or tissue of the body. The symptoms in these cases are often obscure, and the cause of the trouble conjectured largely form the fact that the animal has previously suffered from strangles.

Exceptional cases of strangles are said to occur which present catarrhal symptoms only, without suppuration of the lymphatic glands, but such cases could only be diagnosed as strangles by bacteriological examination. Ordinarily they would be looked upon as common catarrh, or, if the temperature were high, influenza.

There are many other complications in irregular strangles, the lungs may become affected, due either to the descent of matter, when an abscess opens into the pharyngeal cavity, or to the infection being conveyed by the lymphatics.

Therapeutics.—The treatment of ordinary cases of strangles is usually very simple, as the mortality is small. Death is generally due either to the animal being placed in unfavourable surroundings, or being in a feeble condition, or serious complications become developed, or pyaemia supervenes.

If the horse is regularly stabled, he should be placed in a clean, airy stable or box,—by himself if possible; clothe his body, if the weather is cold, but see that he has plenty of fresh air without a draught. Hasten the ripening of the abscesses by applying hot fomentations, poultices, or hot cloths. But as it is difficult to keep these applications close to the swelling, a good dressing is a mixture of tar and fat. If the abscesses become indolent, a little blistering ointment rubbed on to the centre of the swelling will hasten the formation of pus, and the "pointing" of the abscess.

Opening the Abscesses.—Some difference of opinion exists as to when the abscesses ought to be opened, some recommend that they should be opened as soon as pus forms in them, while others are in favour of waiting until they point and are ready to open spontaneously.

I readily admit that the early opening of an abscess will relieve the pain and may reduce the temperature, but I am strongly of opinion that, if an abscess is fully ripe before it is lanced, and then opened freely and the pus thoroughly cleaned out, the cavity will heal more readily, and there will be less liability to the formation of secondary abscesses than when the abscess is opened too early.

When the abscess is deep seated, and the swelling presses on the larynx and seriously impedes the respiration, it then becomes necessary to operate and allow the matter to escape. In such cases, when the swelling is near the throat or under the parotid gland below the ear, it is safer to cut through the skin only with the lancet, and then try to penetrate through the subcutaneous tissues to the abscess with the finger. The blood vessels are numerous in that region, and some of them may be cut, or the parotid gland or its duct may be injured unless due care be exercised. After the abscesses are opened and thoroughly cleaned out, all that is necessary is to keep the part clean and dress daily with some antiseptic, such as a solution of carbolic acid, one part in twenty of water.

In those cases, in which there is a profuse discharge from the nostrils, accompanied by difficulty in breathing and swallowing, but no appearance of the abscess opening externally, relief is often ob-

tained by steaming the head, putting carbolic acid, blue-gum leaves, or turpentine in the boiling water into the bottom of a long sack, inserting the horse's head into the mouth of the sack, and letting him inhale the steam.

With respect to food: give bran mashes, soft green food, or meal gruel, and take the chill off the drinking water, as the cold water pains the tender throat. As medicine, put a teaspoonful of nitrate of potash, either in the mash or the drinking water, three times a day. The principal consideration, however, is to keep the stable sweet and clean, and to allow plenty of fresh air. It is always a dangerous proceeding to attempt to pour fluid medicine down a horse's throat when he is suffering from strangles or acute sore throat from any cause.

If the disease appears among horses that are grazing on the veld, and the weather is mild, it may be unnecessary to do anything in the way of treatment, except in cases that are unusually severe. These should be taken up and attended to at the homestead, giving them soft food or gruel, lest the patients die of starvation from being unable to bend the head to feed, or swallow properly.

In the ordinary mild cases, the constant grazing with the head down assists in the expulsion of the purulent matter from the upper air passages.

Should secondary abscesses appear in other parts of the body, they must be opened and treated in a similar manner, and kept clean by antiseptic dressings. In irregular, as in other forms of strangles, the animal should be kept separate from other equines. The patient requires to be well fed, and a tonic in the form of a teaspoonful of powdered sulphate of iron may be given daily; or in chronic cases, a mixture of sulphate of copper, 1 drachm, and arsenic 3 grains, may be given daily in the food.

APHTHA OR VESICULAR STOMATITIS "TONGZIEKTE."

This is a febrile affection of horses and mules characterised by an eruption of vesicles on the surface of the tongue, on the mucous membrane lining the lips and cheeks, and also occasionally on the skin of the lips and muzzle. These vesicles contain a clear fluid, they are more or less circular in shape, of a yellowish colour, and are slightly raised above the surface of the surrounding mucous membrane or skin. Sooner or later the vesicles burst and form ulcerous-looking sores, which extend and coalesce with one another leaving the surface of the tongue and gum quite raw and painful, rendering the animal unable to feed except with great difficulty; this is accompanied by salivation—"slavering" at the mouth. There is also often a very foetid smell from the mouth.

The disease is communicable from an affected animal to a healthy one by direct inoculation.

A healthy horse with a clean and uninjured mouth may eat out of the same manger with a horse which is suffering from the disease and yet remain free from any appearance of it, but if there are any wounds or abrasions about the horse's mouth, produced either by the bit or from feeding on thorny bushes, such a horse is very liable to become affected.

Treatment.—This consists in washing out the mouth with some simple astringent antiseptic lotion, such as Condy's fluid or a lotion such as the following.

Chlorate of potash	2 drachms.
Borax	3 drachms.
Glycerine	2 ounces.
Water	1 pint.

A couple of wine glasses full should be used to rinse out the mouth three times daily. The animal's head should be elevated, the neck of a bottle containing the mouth wash gently introduced into the side of the mouth, and the contents allowed to flow into the mouth; the head should then be gradually lowered, when the animal will rinse out his mouth by the action of the tongue as the liquid trickles out. On no account should any attempt be made to throw or dash anything into a horse's mouth, as it will cause him to resist any subsequent dressing.

In addition to the local treatment a pint of raw linseed oil may be administered or, preferably, about two ounces of Epsom salts should be given once or twice daily dissolved in the animals drinking water.

A sufficiency of soft, easily digested food should be allowed, such as oatmeal gruel, linseed gruel, bran mashes, green food or even skim or separated milk in severe cases.

Feeding troughs, mangers, buckets, nose bags and bits which have been used by horses suffering from the disease should be disinfected with Jeyes' fluid or Izal before being used for other animals.

TETANUS OR LOCKJAW.

Cause.—The cause of this disease is a specific micro-organism, the bacillus tetani. This microbe is often present in considerable numbers in dust, soil and manure.

When the organism gains access to a wound it remains localised therein, and if the conditions are suitable for its growth and propagation, it proceeds to manufacture a powerful nerve poison, which is absorbed and acts on the nervous system giving rise to the peculiar train of symptoms seen in the course of the disease.

The organism may gain entrance to a wound on any part of the body, but wounds of the feet are especially liable to become infected.

A very small wound may become infected just as well as a large one. Sometimes, indeed, the wound is so small as to be scarcely perceptible. It is an undoubted fact, however, that in every case of tetanus there is a wound on some part of the body, and that this wound has become infected with the specific microbe—the tetanus bacillus.

Symptoms—A stiffness of the muscles over the whole body, more especially the muscles of the neck, which become hard and rigid. The head is elevated, the nose protruded and the jaws fixed, or only capable of opening a little. If the horse be

excited the eye is retracted and the haw or cartilage of the eye will be observed to flick over it; the tail is carried straight out with a trembling motion; the legs stand rigid, a little wider apart than natural, and if the horse is made to walk, the legs are moved forward without bending. The spasm of the muscles in tetanus is continuous, but any noise or excitement increases the paroxysms. The affected animal rarely lies down until completely worn out, when it tumbles down, and its ineffectual struggles to get up again very soon exhausts its strength. The bowels are invariably constipated, the breathing is much quickened and short, about 10 or 50 respirations per minute, the pulse is not much quickened, generally about 40, a full distinct pulsation is felt until towards the end, when it becomes weak and hard; the temperature is not much altered generally.

Treatment.—Examine the animal carefully and endeavour to find the wound. Pay particular attention to the feet, and look carefully for pricks in shoeing, or a picked up nail. If either of the latter be discovered take off the shoe, clean out the wound, and dress it with carbolic acid lotion, or apply a hot bran poultice containing some disinfectant such as Cyllin or Jeyes' fluid. If the wound is found on some other part of the body this should be dressed most thoroughly with carbolic lotion (carbolic acid one part, water nineteen).

Place the horse in a dark box away from all noise and disturbance; allow no one near him but his attendant.

After a day or two, and before he becomes too tired, place slings under him so that he can rest in them when he chooses.

If seen in the early stages, and if the jaws are not fixed, an aperient can be given. If so fixed, repeated injections of oil and soap-suds may be given to move the bowels.

Arrange the manger high, so that the patient can get his head into it with ease, as there is great difficulty in bending the head. Leave a constant supply of water and oatmeal gruel in front of the animal. Skim milk may be tried if the animal cannot swallow anything more solid.

A great number of medicinal agents have been tried in the treatment of tetanus, but only moderate success has attended their use. The extract of belladonna and bromide of potash in drachm doses, made into an electuary or paste and smeared on the teeth is easily administered without exciting the patient, and may produce a beneficial effect. Other remedies used are chloral, solutions of iodine, prussic acid, chloroform, Indian hemp, opium, etc., etc. The most essential consideration, however, is perfect quietude and careful attention.

Prevention.—This consists in carefully cleaning out *every* wound and dressing it with some antiseptic lotion, such as carbolic acid, Jeyes' fluid, etc.

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PYAEMIC OR SEPTIC ARTHRITIS OF SUCKLINGS.

Joint Ill—Navel Ill.

This disease of the joints of foals, calves, lambs and kids, accompanied by swellings, pain and stiffness is very common where breeding operations are conducted on a large scale.

The disease usually makes its appearance within from seven to twenty days after birth. It may occur in isolated cases only, or, again, it may spread rapidly, affecting a large proportion of young animals in a herd flock or breeding stable.

The term "navel ill" has been applied to this malady in consequence of the fact that in addition to the noticeable diseased condition of the joint, the navel and blood vessels of the cord are invariably more or less affected. In fact it was the unhealthy condition of the blood vessels and tissues of the navel which first led to the discovery of the cause of the disease, viz., the entrance of infective organisms into the blood vessels of the open navel, at, or immediately after birth.

The organism to which the disease is due, gains access to the navel before it is closed, and grows and multiplies in the blood clot formed in the broken end of the vessels. Finally, the micro-organisms are carried away by the blood stream and distributed to various parts of the body, amongst other places particularly to the joints; but other internal organs, such as the liver, are not infrequently involved. In the capillaries of the organ or tissue in which the microbe may be arrested, it sets up inflammation resulting in the collection of quantities of pus (matter) of a peculiar character. In addition, these local effects are always accompanied by a debilitating fever and other systemic effects.

It is further evident that the disease is contagious, and may, therefore, be introduced into a breeding stable, herd or flock by an infected animal.

Symptoms.—These, as already mentioned, are associated with the joints and navel. Usually the first symptoms noticed are that a few days after birth the young animal manifests difficulty in movement; is listless, feverish and the desire to suck is diminished or suppressed. The navel is generally swollen, open, and discharging matter; and although sometimes it may appear healed on the outside its neighbourhood is swollen and inflamed.

The swellings of the joints soon develop. Any joints may be affected, but the knee, hock, hip and stifle joints are most frequently attacked. The affected joints are hot, swollen, painful, and the animal is now very lame; is, perhaps, afraid to touch the ground with the affected limb, and may lie down a great deal.

Abscesses form sooner or later in the affected joints, and the matter within the joint may penetrate outwards. Debility and wasting become marked. There is considerable elevation of the body temperature, and usually to the other symptoms are added diarrhoea, the fæces being greyish white and evil-smelling.

In this disease the mortality is frequently very high. The course of the disease lasts, as a rule, but a few days.

Treatment.—Curative measures are not very hopeful once the disease has developed. Attention should be given to the navel, from which all unhealthy matter should be removed, and the part thoroughly cleansed and dressed with a disinfectant such as carbolic acid and water (one part of the former in twenty of the latter). The treatment of the affected joint is purely surgical, and hardly within the scope of the inexperienced; however, if any secondary abscesses occur in non-essential parts of the body these should be opened, cleansed and disinfected in a similar manner. It is in preventive measures that most success is likely to be attained. All boxes into which mares are placed to foal, and in which they remain with their foals should, previously to occupation, be thoroughly cleaned and disinfected.

In breeding stables, where the disease has once occurred, all foals immediately after birth should have the navel well washed with a disinfectant solution, such as carbolic lotion, after which the cord should be tied an inch or so from the foal's body with a string which has previously been thoroughly immersed for some time in a disinfectant solution. In this way the absorption of infective germs by the navel may be prevented. An alternative method, which can be recommended consists merely in painting the navel with a little tincture of iodine.

GENERAL DISEASES.

PURPURA HAEMORRHAGICA.

ANASARCA, PETECHIAL FEVER.

This disease is characterised by the presence of acute swellings, which suddenly make their appearance about the head, limbs and dependent parts of the body. These swellings contain a red-colouried serous fluid.

Nature and cause of the disease.—Not very clearly understood. Pupura usually manifests itself during convalescence from some previous debilitating disease. Especially does it occur after strangles and diseases of the respiratory tract, such as influenza, pneumonia, etc. Some authorities consider the malady due to the poisons or toxic products of the micro-organisms which produced the primary disease—strangles or influenza—which have been absorbed into the system and so affected the nervous and vascular structures as to produce the characteristic swellings, exudations and general symptoms seen in the course of the disease.

Purpura is not infectious, and so far has never been conveyed by experimental inoculation from diseased to healthy animals.

Symptoms.—These are the sudden appearance of swellings, about the head, the limbs, the abdomen, or chest, and of small purple spots like flea-bites on the mucous membrane lining the eyelids and nostrils. The swellings, more especially early in the attack, may move from one part of the body to another—for example they may move from the hind legs, and appear about the head and fore-legs, and *vice versa*. They

may also disappear from the surface of the body, and extravasation of the bloody fluid take place into some of the internal organs, when acute abdominal pain will be manifest, followed often by sudden death. The swellings have generally an uniform smooth appearance, and pit on pressure. A striking peculiarity about those on the legs is that they terminate abruptly at the top by a distinct margin. The swellings in the legs sometimes assume enormous dimensions, and a yellowish looking fluid oozes out at certain parts in beads or thick drops. In severe cases pieces of the skin will slough off, leaving very nasty sores.

The swellings about the head may only appear on the lips and nostrils at first, but in many cases the whole head swells up enormously, making it difficult for the animal to breathe and impossible to eat;—the horse may be able only to place his muzzle well down into a pail of thin gruel, and suck up a little with difficulty. These swellings are not very painful to touch, but in severe cases, the horse looks a hideous object, with generally a bloody coloured mucous discharge from his nostrils. A soft kind of cough is also present generally, and the urine has a strong odour of ammonia. In some cases the acute attack may terminate in three or four days, in others it may last for a fortnight. I remember one case which had been ill for ten days, but was recovering, apparently very satisfactorily, and feeding well, when suddenly the extravasation took place into the bowels and the animal died within a few hours. I attributed this relapse to the patient, a mare, getting as much dry forage as she could eat. In another case there were two attacks of abdominal pain, and great distress, the animal manifesting all the symptoms of colic, perspiration rolled off the body, and at the close of each such attack, the external swellings disappeared almost entirely. The animal ultimately recovered after being ill for three weeks. The temperature is variable, from 102° Fah. The pulse is quick-soft and easily compressible. The patient is inclined to feed if the swellings about the head will allow it.

Treatment.—Give first oil of turpentine 1 ounce, in half a pint of raw linseed oil, and repeat the turpentine, mixed with a little milk three times a day. Bathe the swellings with cold astringent lotion, such as 6 ounces of alum in a gallon of water. Give thin gruel to drink, such as meal and water, bran and water, or any soft easily digested food which the patient will eat. Should colicky pains arise, give 2 drachms of the extract of belladonna.

In addition to turpentine internally, ergot is highly recommended. Give the liquid extract of ergot in one ounce doses, repeated every four hours, mixed in a little milk or thin gruel. Solution of the perchloride of iron in one ounce doses, dissolved in half a pint of water is also recommended; but I have most faith in the turpentine and nourishing drinks.

Ordinarily, these cases are not so severe in this Colony as in England. By giving a few doses of turpentine, and about half an ounce of saltpetre in gruel twice a day, every case has recovered. Professor Williams recommends the chlorate of pot-

ash in the same doses. Keep the bowels acting but avoid purging, and it is better not to puncture the swellings unless they seriously interfere with the breathing.

AZOTURIA, Azotœmia, or Hœmoclobinuria of Horses.

Causes.—Rich food, associated with a few days' rest in the stable. It is believed to be due to derangement of the functions of the liver.

Under ordinary conditions one of the chief functions of the liver is to act as a toxin filter, to render inert poisonous material conveyed to it for that purpose.

Under the conditions which prevail in the causation of azoturia, however,—enforced illness with excessive rich diet—poisonous substances are formed in the intestinal tract in extravagant amount as the result of bacterial action, and the fermentative and putrifactive changes going on in the enormous mass of material lying there. These poisonous products reach the liver in such huge quantities that the organ is unable to cope with them, and consequently they pass unchanged, or only partially changed, into the general circulation. Especially does this occur during the exercise first following the period of idleness, and it is at this period the poisonous products are observed to exert their harmful effects on the system, giving rise to the train of symptoms known as "azoturia."

By one authority the starting point of the disease is believed to be an over-production of the red blood corpuscles, unaccompanied by a steady destruction of them, such as goes on in health, and that this over-production is somehow determined by the period of rest and the liberal diet of which there is a history in nearly every case of the disease.

Symptoms.—These develop suddenly, as a rule a very short time after a horse has commenced active exercise. The horse, after being at rest in the stable for a few days without exercise, comes out fresh and lively, and moves very freely; but before he has gone many hundreds of yards, he begins to tremble, and to blow or breathe quickly, while the perspiration breaks out profusely all over the body. The muscles of his hind quarters become cramped and hard, and he moves stiffly with a crouching and drooping action of his hind quarters, as if unable to support the weight of the body; at last he drops down, and is unable to rise again, although he may struggle a good deal.

In severe cases, a sort of involuntary movement of the limbs continues for some time after the animal drops down; he may die in a few hours, or make a somewhat prolonged recovery. If any urine is passed it is of a brown colour, like muddy coffee.

There are some milder cases, in which the animal trembles, breaks out into a profuse perspiration, the breathing becomes quick and blowing. He walks apparently stiff and cramped in the hind quarters, and appears uneasy, almost like a horse in the first stages of colic. If stopped in time and got to a stable, a dose of purgative medicine given, and hot rugs applied to the quarters such cases generally recover in a day or two.

Treatment.—Give at once a smart dose of physic, 6 drachms of aloes, or a bottleful of raw linseed oil. Apply cloths wrung out of boiling water to the loins and hind quarters, and hand rub the legs; clothe the whole body well in order to promote perspiration. Give a desertspoonful of saltpetre in the drinking water, or in a mash, twice a day.

The following particulars refer to a case which occurred in Cape Town. The animal had been resting in the stable for some days, and getting rich nutritious food; he was then inspanned and driven a few hundred yards, when he began to blow, heave at the flanks, perspire profusely, to droop in his hind quarters, and appear greatly distressed. He soon after dropped down, and when I saw him a few minutes after, he looked like a horse completely paralysed, with the characteristic hard and swollen condition of the muscles of the hind-quarters. I gave him a stimulant of ether with tincture of belladonna and had him taken to the stable on a wagon, as soon as could be arranged. I gave him at once 5 drachms of aloes, and applied hot rugs wrung out of boiling water to his loins and hind-quarters. He was perfectly unable to rise up, or to stand when lifted. I got slings erected, and after twelve hours, raised him up in them, but he was quite unable to stand on his hind legs, even with the support of the slings. Nevertheless I had him steadied and supported for about half an hour, during which I had his legs and body well rubbed down, gave him an injection of soap and warm water, and lowered him carefully down again, recommencing the hot rugs to his quarters, and lots of clothing to his body. I had him raised up in this manner twice a day, lengthening the period in which he was kept standing each time, and having him well hand-rubbed, using a little embrocation to the quarters. After the third day, he was able to stand all day, by the aid of the slings, and was allowed to lie down all night, but he could not rise without the slings nor control the movements of his hind legs very satisfactorily. He got mashes, carrots, and other soft laxative food, with about half an ounce of saltpetre daily, and within a week, he was able to take a little walking exercise, and made a very satisfactory recovery.

There are some cases, which when allowed to remain down for a long time, the muscles of one or both hind quarters become semi-paralysed and wasted, and the animal for a long time walks with a drooping knuckling motion of the hind legs, the muscles being unable to support the weight of the quarters. In such cases apply friction to the muscles with a little embrocation, and give twice daily, half an ounce of the bicarbonate of potash in the food or water, and support the animal in slings during the day, letting him lie down during the night.

Prevention consists in the regular daily exercise of working horses when they are not actively employed. During enforced idleness the diet should be reduced, and preferably non-stimulating food given.

RHEUMATISM.

This is a peculiar form of inflammation affecting the fibrous tissues of the body, such as muscles, tendons, joints, etc. Its pathology is not definitely known, but it appears to depend on some general or constitutional morbid state, and has a tendency to shift from one joint or limb to another. It is not very easy to recognise in the lower animals; generally the diagnosis is arrived at by a process of exclusion. Any painful affections of joints or muscles which cannot be attributed to a bruise, sprain, or similar injury, is generally put down to rheumatism.

Causes.—These are a constitutional predisposition, a sudden chill, exposure to cold and wet after exhausting labour. A very fruitful cause of this affection in this Colony is the extremes of temperature met with in the higher districts of the Colony during the winter months. Rheumatism is very common amongst horses, in places like Kimberley, where the stables are constructed principally of galvanised iron. During the day time they are extremely hot, and during the night bitterly cold.

Symptoms.—In acute rheumatism, the horse is dull, with a disinclination to move, this is quickly followed by lameness in one or more limbs, with heat, tenderness, and more or less swelling of the joints affected. If the pain and lameness moves from one joint or limb to another, it is considered characteristic of rheumatism. In acute rheumatism there is fever, a quickened hard pulse, increased temperature, and quickened breathing. In the chronic form stiffness or lameness will suddenly appear in a joint or limb after any undue exposure. I have seen horses become quite stiff in both fore quarters, a few hours after being washed with cold water. In old standing cases the affected joints become enlarged, and the lameness recurs with any exciting cause.

Treatment.—This is both general and local. Give a dose of laxative medicine, such as 4 drachms of aloes, and follow this up with the following powder mixed in the food twice a day:—

Powdered saltpetre	2	drachms.
Flowers of sulphur	2	do.
Powdered colchicum	1	do.

If the rheumatism is acute, accompanied with much fever, give the salicylate of soda 2 drachms three times a day, until the fever abates. Give bran mashes, and soft food. Locally, if in one or more joints, apply woollen bandages wrung out of boiling water, with dry bandages over them. If in the muscles of the shoulders, chest, or hind quarters, apply rugs wrung out of boiling water, and covered over, in the same manner, with dry rugs, or bags. Clothe the body well, and promote perspiration. After the application of the hot water bandages or rugs, rub in a little embrocation with a smart friction, adding equal parts of belladonna liniment if the pain is acute, but keep the parts covered with dry woollen rugs or bandages until the pain ceases. If the pain and acute lameness settles in a joint, apply a smart cantharides blister, as recommended by Prof. Williams. I have witnesses marked beneficial results from that treatment

In chronic cases, avoid washing with cold water, also avoid sudden chills, especially after work; give laxative food, and frequent doses of sulphur along with the bicarbonates of potash or soda alternately.

LYMPHANGITIS, Inflammation of the Lymphatics known also as "Weed" and "Water Farcy."

Causes.—This diseased condition is due to an accumulation in the blood of nutrient elements, which should have been used up, or excreted by exercise, but which being retained, cause irritation and inflammation of the lymphatic vessels and glands. It is most common in heavy, fleshy-legged horses, which are usually hard worked and well-fed, but have been left in the stable for a day or two without exercise. It has been called Monday morning disease, as it very frequently occurs on that morning, after the Sunday's rest.

Symptoms.—It generally commences with a shivering fit, followed by a fever stage, in which the horse begins to blow or breathe hard, perspiration runs off his body, his pulse is quickened, full and strong, and lameness appears in one leg, generally a hind one, but it may in rare instances occur in a fore leg. The lymphatics which are situated inside the thigh, just opposite the sheath, in the male, or the udder in the female, become swollen and intensely painful. If the corded swelling be touched with the hand, the horse will suddenly lift up his leg in a lateral direction, and hold it out, in a manner indicative of the most acute pain.

The swelling at first extends down the lymphatic cords, then gradually becomes diffused over the entire limb, which becomes intensely swollen. As the swelling of the whole limb increases, the acute pain becomes relieved. After two or three days, under proper treatment, the swelling gradually decreases, but it very seldom disappears entirely, and the animal is very liable to a recurrence of the attack, each of which is liable to leave the limb with on increased permanent enlargement. In some cases abscesses may form, which are liable to be mistaken for farcy buds.

Treatment.—Give a smart purgative, either a 5 drachm aloes ball, or a bottle of raw linseed oil. Apply hot fomentations to the limb *continuously.*—A good plan is to make a thick rope out of some soft grass or straw, and wind it round and round the whole limb from the foot up to the groin, and apply the hot water continuously. The encasing of the limb in this manner keeps in the heat; several folds of cloth applied, in a similar manner, will answer. It is essential that the fomentations be kept up continuously until the acute stage is past.

In addition to a dose of purgative medicine, give a dessertspoonful of saltpetre in a bran mash, or dissolved in the drinking water, twice a day. During the acute stage, when the pain is great, the breathing rapid, and the pulse quick, strong and full, give ten drops of tincture of aconite every hour.

As soon as the acute pain is relieved, and the horse is able to move the leg, give him a little gentle exercise, and apply friction

to the swollen limb, either with the hands or a wisp of straw. A little embrocation may be applied after the inflammation has subsided to stimulate the absorbents, and any chronic thickening that remains, may be removed by applying a large bandage to the leg when standing in the stable.

Give laxative diet when under treatment, and be careful to reduce such a horse's allowance of food when necessarily laid up from work for a day or two, after an attack of this affection.

OEDEMA OR SWELLING OF THE LEGS.

Simple swelling of the legs frequently occurs in horses, without either fever or inflammation.

Causes.—The principal cause is debility, want of tone, or condition; hard work, and insufficient food, or food deficient in quality. It may also arise when a weak, hard-worked horse gets rest and rich food. It indicates debility, a relaxed condition of the blood-vessels and tissues, and a feeble heart.

Symptoms.—A diffuse swelling appears on the legs, it may be on all four, but most frequently in the hind; the swelling pits on pressure, the legs presenting a flabby looking appearance, there is neither heat nor pain. Unless of long standing, the swelling generally disappears when the horse is taken out to work, to return again as soon as he rests.

Treatment.—If the animal be fat, give a dose of physic, either 5 drachms of aloes or a pint of raw linseed oil, and follow this up with diuretics, tonics and good food, with light, but regular exercise or work.

Give Nitrate of potash	4	drachms.
Sulphate of iron	1	do.
Gentian root	2	do.

mixed in a bran mash, or other food, once a day for a week or ten days.

Local treatment to the legs consists in applying bandages, firmly but with even pressure, as soon as the horse comes in from exercise. The pressure will brace up the tissues and assist in the absorption of any effusion. On removing the bandages, apply cold water to the legs freely, but sponge them down and rub them dry immediately after. Do not apply cold water, unless the legs can be rubbed dry or the bandages replaced at once.

DISEASES OF THE RESPIRATORY ORGANS.

BLEEDING FROM THE NOSE.

Causes.—Disease of, or injury to the mucous membrane, or to rupture of a bloodvessel from violent exertion; a paroxysm of coughing or obstruction to the circulation by a tight collar. If the bleeding is from the nose, the blood trickles as a rule, from one nostril only, accompanied by sneezing, or repeated blowing from the nostrils, and there is an absence of froth. If the bleeding is from the lungs, it flows from both nostrils, is bright red and frothy, and is accompanied by coughing.

Treatment.—In bleeding from the nostrils keep the horse quiet, fasten his head up; place a cloth over it, and pour cold water on it constantly, until the bleeding ceases.

In obstinate cases, the nostril may be plugged with cotton wool, or wool, or some teased tow. Tie a piece of string around the plug to enable you to pull it back when the bleeding ceases; needless to say only *one* nostril should be so plugged, and the plug must be at once removed if it interferes markedly with the breathing.

In bleeding from the lungs, when persistent, the following medicines may be administered:—Turpentine 1½ ounce, or solution of perchloride of iron 1 ounce, mixed in a bottle of milk or thin gruel, and repeated in a few hours if necessary.

CATARRH OR COMMON COLD.

Causes.—Exposure, changes of temperature, foul air, or irritating gases.

Symptoms.—Sneezing, a red and congested condition of the mucous membranes lining the eyes and nostrils, followed by a watery discharge. The discharge from the nostrils may become mixed with purulent mucous in severe cases. There is more or less fever depending on the severity of the case.

Treatment.—Give the horse rest, and place him in a comfortable, but airy stable or shed. If the weather is cold put a rug on him. In all diseases of the respiratory organs, be careful to avoid placing the patient in a close, dirty stable, where the atmosphere is foul. Pure air, and an equable temperature, are the most essential considerations in the treatment of diseases of the respiratory organs. Give bran mashes, or green succulent food, if it can be procured, and a teaspoonful of saltpetre, twice daily in his food or water. In severe cases steaming the head may be resorted to, a little turpentine, carbolic acid, or blue gum leaves being put in the water used for steaming.

CHRONIC CATARRH, Nasal Gleet, Snot Ziekte.

This is a chronic discharge of matter from one or both nostrils.

Causes.—It generally follows an acute attack of catarrh, or cold in the head, from the pus becoming lodged in the sinuses of the forehead and face. These sinuses are air cavities, situated between the plates of the bones forming the forehead and sides of the face, and communicating with the nasal passages. In acute catarrh the mucous membrane lining these cavities becomes affected and pours out a secretion. When this becomes purulent in character, the pus lodges in these cavities and becomes a source of constant irritation, and formation of matter.

If a horse, while suffering from a bad cold, be neglected, exposed to severe weather, or gets insufficient nourishment or what is even worse, be confined in a dirty, close, ill-ventilated stable, the discharge is very apt to assume a chronic form.

Nasal gleet may also arise from a diseased tooth, an injury to the bones of the face, or from a tumour in the nasal passages.

Symptoms.—If the discharge is from pus in the sinuses it will be white, or of a yellowish-white colour and curdy appearance, and come away irregularly; it is very often discharged in clots, when the horse is drinking. If it arises from a diseased tooth, it will flow more regularly, and have a most offensive smell. Further, when it is due to a diseased tooth the horse will have a difficulty in masticating his food, stopping occasionally and holding his jaws apart as if suffering pain. There will be an offensive smell also when the bones are injured and diseased, and in addition, it will be possible to detect some alteration in the bones of the diseased side, by careful comparison with the other. Tapping with the knuckles on the affected side will also indicate the seat of the disease by the pain which it gives, in addition to the difference in the sound produced between one side and the other. The lymphatic glands are swollen, and the eye on the affected side is generally more or less affected. The discharge is generally from one nostril only, but may be from both.

Treatment.—The treatment of chronic nasal gleet is very unsatisfactory without an operation, which requires an expert. If from pus in the cavities of the face, often the best thing to do is to turn the horse out to the veld; constant grazing with the head down, and the fesh air, may assist recovery. If the discharge arises from a diseased bone, or a diseased tooth, in either case, the diseased bone must be removed and the diseased tooth extracted, before recovery can take place. In the same way, if the discharge arises from a tumour in the nasal passage, this must be removed.

Fumigation, by burning sulphur in the stable for an hour daily, steaming the head with carbolic acid fumes, or turpentine fumes, will, in some cases benefit. Many farmers blow snuff up the nostrils, and burn rags and brown paper under the horse's nose, while a blister rubbed in over the affected side may do good. As medicine one of the best is arsenic, given either as white arsenic 4 grains daily, or a fluid ounce of the liquor arsenicalis. One drachm doses daily of sulphate of iron, or sulphate of copper may also be tried alternately with the arsenic.

Difference between Glanders and Nasal Gleet.—In glanders there are pimples and ulcers on the mucous membrane of the nostrils; in nasal gleet there are none. In glanders there is rarely any strong smell from the nasal discharge until the ulcerations have penetrated to the bones or cartilage, when no mistake as to its nature can be made. In nasal gleet the discharge has generally an offensive odour, and when from a diseased bone or tooth, an abominable stink. In glanders the discharge is of an adhesive character, and sticks to the edges of the nostrils, and although there may be a little difference in the flow occasionally, it comes away pretty constantly and uniformly. In nasal gleet, on the other hand, the discharge is whitish in colour, often curdy looking, has little tendency to stick to the edges of the nostrils, and comes away more irregularly, sometimes even in lumps.

SORE THROAT.

Causes.—Similar to those of a common cold.

Symptoms.—The nose is raised and slightly protruded, the head is carried stiffly, there may, or may not, be visible swelling of the throat, but it is tender to pressure; there is a hard cough, a difficulty in swallowing, especially cold water, which returns back through the nostrils. If fed on green food, there will be a greenish discharge from the nostrils from the same cause.

Treatment.—Rest in a clean, dry, airy stable, and clothe the body if the weather is cold. Apply mustard to the throat. (Take one or two tablespoonfuls of mustard, make it into a paste like very thick cream, and rub it in round the throat from ear to ear, and into the space between the branches of the lower jaw). Give bran mashes, green food, and if the case is very severe, steam the head.

In cases of sore throat do not attempt to pour irritating medicines down the animal's throat. Fasten a little piece of the extract of belladonna on to the back teeth, and give half an ounce of the bicarbonate of potash, or two drachms of nitrate or chlorate of potash in his food or water, daily.

BRONCHITIS.—Inflammation of the Bronchial Tubes.

Causes.—Exposure to cold or wet, inhaling hot smoke or strong irritant vapours. It may also follow a neglected cold or catarrh, or be associated with such diseases as influenza, strangles, etc.

Symptoms.—Breathing quickened, a cough, hard and dry in the first stages, but becoming more soft and moist as the discharge from the air passages becomes established. In severe cases the horse is dull, the appetite lost, the breathing quick and laboured. The cough is hard, sonorous and distressing, occurring in paroxysms when the animal will nearly go down on his knees in his struggles to expel the thickened mucous, which comes up in long flakes and is discharged through the nostrils. The pulse is quick and feeble.

Treatment.—Place the horse in a comfortable dry, airy building. If the weather is cold, clothe the body, bandage the legs; rub some mustard down the course of the windpipe, in front of the chest, and on each side of the chest behind the shoulder. In severe cases steam the head constantly, and put some carbolic acid, turpentine, or blue gum leaves in the boiling water used. Internally give him bran mashes, or oatmeal gruel, and add to these a teaspoonful of powdered chlorate of potash, three times a day. Keep the air in the stable fresh and pure.

Chronic Bronchitis.—A chronic cough often remains for some time after these acute cases, which it is difficult to get rid of. A good remedy is to give liquor arsenicalis, a tablespoonful twice a day, continued for about a fortnight.

ACUTE CONGESTION OF THE LUNGS.

Causes.—Over-exertion, such as hunting, galloping long distances, &c., met with especially in fat or ill-conditioned horses.

Symptoms.—The horse begins to slacken his speed, labours in his pace, and if not stopped, will stagger and fall. Or he may stand with nostrils dilated, breathing quick and laboured, head extended and the countenance expressive of anxiety and distress. Pulse quick and weak, and the mucous membrane lining the nostrils of a purple colour.

Treatment.—Remove the saddle or harness, or anything that would interfere with the breathing, and give a strong stimulant immediately, such as whisky or brandy half a pint; carbonate of ammonia half an ounce, spirits of nitrous ether 2 ounces in a pint of water; or turpentine 2 ounces in a pint of milk. Give hot water injections and hand rub the body and legs, or envelope the body in rugs wrung out of boiling water. In extreme cases, the lungs become gangrenous, and the animal dies; on the other hand the congestion may be relieved, and the animal make a rapid recovery. In many cases, however, *Pneumonia* or *Inflammation of the lungs* supervenes, when recovery is very slow.

PNEUMONIA or *INFLAMMATION OF THE LUNGS* may be caused by cold and exposure, as well as over-exertion, and may arise as a primary affection.

Symptoms.—Shivering, followed by fever, quickened breathing, a quick soft pulse; the mucous membranes are red and injected looking. The cough is deep as if coming from the lungs, but it is not so hard or so painful as in bronchitis. As the disease advances, a yellowish or rusty coloured discharge will flow from the nostrils. The horse stands persistently.

Treatment.—The most essential consideration is comfort, and dry, pure air. Clothe the body well, and put flannel bandages on the legs. During the acute stages apply hot rugs to the body, followed by a little embrocation or mustard rubbed on to the sides and chest, not to blister, but simply to stimulate the skin. Give bran mashes, green food and nourishing drinks, such as oatmeal and water. As the bowels are often constipated, give injections of warm water, and put one or two tablespoonfuls of Epsom salts in the drinking water daily, but avoid purging. Or give half ounce doses of bicarbonate of soda or potash daily in the food or drinking water. Should there be great prostration, give stimulants such as spirits of nitrous ether, 2 ounces, or aromatic spirits of ammonia 2 ounces, in half a pint of water. I do not recommend the frequent administration of drenches to horses when suffering from acute affections of the chest in this Colony, as they are given so carelessly that serious results very often follow.

Pure fresh air and warm clothing, along with soft nourishing diet are the principal things to attend to. There is nothing worse than a close stable and a foul atmosphere.

PLEURISY OR INFLAMMATION OF THE SEROUS MEMBRANE, WHICH COVERS THE LUNGS AND LINES THE CHEST.

Causes.—Similar to those which induce other chest affections.

Symptoms.—These are very similar to those of inflammation of the lungs, but the characteristic symptom is, the horse stands

as if stiff and sore all over, shows an unwillingness to turn round, and when made to do so grunts and groans, indicating that the movement gives him great pain. The breathing is quick and characteristic, the ribs are fixed, or move very little in breathing, the respirations being carried on principally by the abdominal muscles. This abdominal breathing causes the ends of the ribs to form a distinct ridge all along their junction with the abdominal muscles. The cough is also peculiar, it is a short hacking, painful cough, sounding as if suppressed, on account of the pain. The pulse is hard and wiry to the feel, and great pain is evinced when the ribs are struck by the knuckles. Pleurisy generally terminates in an effusion of fluid into the chest. When the quantity is small, absorption may take place and the patient makes a rapid recovery. If the quantity of fluid is great, this will be indicated by the pulse becoming quick and feeble, the breathing laboured, with increased action of the flanks; there is also a flapping sort of movement of the nostrils, and a peculiar in and out movement of the anus at each respiration. Swellings appear under the chest and abdomen, and down the legs.

Treatment.—This is similar to that for inflammation of the lungs; comfort, fresh air, warm clothing and bandages, and soft, succulent food. Hot rugs wrung out of boiling water and applied to the chest, are of the greatest advantage in the acute stage of pleurisy. This should be kept up continuously until the acute pain is relieved. As medicine give bicarbonate of soda or potash ½ ounce twice a day in the food or water. If very weak, give stimulants, such as spirits of nitrous ether one ounce, or carbonate of ammonia ½ ounce in a pint of water, three time daily; or a tumblerful of brandy or whisky. If there is much pain and restlessness in the early stages, add one drachm of the extract of belladonna, or one ounce of laudanum to the mixture.

It is very rare that pleurisy occurs without the lungs being affected also, and *vice-versa*. When there is pneumonia as well as pleurisy, it is called pleuro-pneumonia, and when there is pneumonia as well as bronchitis, the combination is called broncho-pneumonia. But these distinctions are not readily diagnosed except by experts, and their general treatment is the same.

Suppuration or Abscesses in the Lungs.—This sometimes follows inflammation of the lungs, when a large portion of the lung has been inflamed, but more frequently when the sick animal has been allowed to stand in a close, dirty stable, inhaling foul, putrid air.

Symptoms.—The breath has a most offensive smell, and there will be a discharge of matter from the nostrils, especially after coughing.

Mortification or Gangrene of the lungs may follow acute congestion, or intense inflammation of the lungs. This condition is also indicated by an offensive breath. These cases rarely recover.

When a horse is recovering from any disease of the chest, and his appetite returning, the following tonic, given once a day, will do good:—

Powdered sulphate of iron, a small teaspoonful.
„ gentian root a full do.
„ nitrate of potash do. do.

To be mixed in a bran mash, or dissolved in a little water and sprinkled on some nice finely cut forage. Do not give iron tonics, however, until the patient begins to feed. Good nourishing food, and fresh air, are the best tonics in chest affections.

BROKEN WIND.

This affection is comparatively rare in this Colony.

Causes.—Feeding with bulky innutritious food, chronic indigestion, or violent exertion on a full stomach.

Symptoms.—Inspiration is natural, but the expiration of air from the lungs is performed with a double contraction of the abdominal muscles. In the first contraction, the abdominal muscles press inwards, and after a perceptible interval, the second contraction takes place, when the muscles of the flank are drawn up with a sort of effort and fall again with considerable force. There is a short, dry cough, occurring in paroxysms often when the animal is first brought out in the morning, or after drinking water.

This complaint is always associated with indigestion, and a morbid appetite, and there is a frequent passage of wind from the bowels (breaking wind).

In bad cases, there is a peculiar movement of the nostrils. These symptoms may not be very clearly marked until the animal is submitted to severe exercise. A gallop after a drink of water, intensifies them.

Treatment.—This can only be palliative, there is no known cure. Give nourishing food, but prevent over-loading of the stomach; damp all dry food; keep the bowels acting freely with bran or similar food. Do not work the horse so affected for two hours after a full feed, or a large drink of water.

If the case is only a mild one, give one tablespoonful of liquor arsenicalis in the food or water, morning and night for some weeks. Or five grains of white arsenic laid on the tongue, once a day, for a like period. About 4 ounces daily of a mixture of lime water and raw linseed oil, is said to be very good.

ROARING.

This is a loud wheezing noise made by a horse in breathing, especially when exercised, or excited.

Causes.—It is due to some obstruction to the free passage of air in the upper air passages, such as a tumour in the nostrils, or a thickening or compression in some part, but most commonly to paralysis and wasting of the muscles of the left side of the larynx.

Symptoms.—When the noise is caused by some obstruction in the nostrils, the noise will be heard during expiration as well as during inspiration, but if the cause is paralysis of the muscles of the larynx, the noise will be heard during inspiration only. This is the condition generally understood when we speak of a horse being a confirmed roarer.

There is no cure for such cases. But if the roaring arises after strangles, a blister may be applied to the throat, and one drachm of iodide of potassium given daily for some time, followed by a course of arsenic, 5 grains daily. Such animals are generally only fit for slow work.

PNEUMO-THORAX or Air in the Chest.

Causes.—A wound penetrating the chest, admitting the air, or a broken rib penetrating the lung.

Treatment.—All wounds of the chest should be closed up as quickly as possible. Clean out the wound carefully, extract any foreign matter. If the wound is cut with a sharp instrument stitch it up, if a jagged wound close it up with a plaster or bandage and dress it with a solution of carbolic acid or other antiseptic. If a rib or ribs are fractured, place a pitch plaster on to the side of the chest over the part, or fold a piece of cloth, lay it over the part, and fix it by means of long bandages fastened round the chest. I have seen such a case in which a fractured rib penetrated the lung and a rent was made in the muscular covering of the chest, but without any wound through the skin. The symptoms were *emphysema* or air under the skin over nearly the whole of the injured side, as well as on the loins, with acute pain in the chest, and general symptoms of fever. When there is a wound through the skin, the air will rush out and in during inspiration and expiration respectively.

SPASM OF THE DIAPHRAGM or Hiccough.

Causes.—Exhaustion from over-exertion, generally associated with indigestion, &c.

Symptoms.—A thumping sound heard at a considerable distance, and generally mistaken for the loud beating of the heart. It may be distinguished, however, by feeling the pulse, which will not correspond with the thumps. On placing the ear to the chest the sound will be heard behind the seat of the heart. Each thump will send its vibration through the whole body.

Treatment consists in rest and the administration of a stimulant, such as half a pint of whisky or brandy in a pint of water, with laxative food.

DISEASES OF THE DIGESTIVE ORGANS.

The Mouth.—Wounds, bruises, or inflammation of the mucous membrane lining the mouth and covering the tongue.

Causes.—Mechanical and chemical irritants, and injuries, such as injuries to the lower jaw by the bit, to the cheeks and tongue by the teeth, to the lips by blows, to the tongue by a rope or the bit, and to any part of the mouth by splinters of wood, bearded chaff, &c., contained in the food. Inflammation may be caused by scalding food, or by any strong irritating medicines.

Symptoms.—A difficulty in feeding, slavering at the mouth, a swelling about the lips or cheek, &c.

Treatment.—Examine the mouth carefully, and search for any foreign substance which may be lodged in the mucous membrane, in the tongue, or between the teeth. Examine also for any wounds to the lower jaw from the bit, or underneath the tongue from roughly pulling that organ. Remove any foreign substance, and clean all particles of food out of any wound. If the jaw is injured by the bit, search for any loose splinters of bone and extract them, then clean out the mouth with an astringent healing lotion, such as alum one ounce in a quart of water, three times a day, and feed on soft food, such as bran or green food, until the mouth is healed. All wounds in the mouth should be carefully and tenderly cleaned out, before washing the mouth with the lotion.

"*Lampas.*"—Inflammation of the mucous membrane covering the bars of the palate, immediately behind the incisor teeth of the upper jaw.

Causes.—Teething in young horses, or it may be induced by hot food, or irritating medicine. It is very rare, although stablemen consider that every horse which has prominent bars is the subject of "lampas."

Treatment.—Lightly scarify the inflamed bars, and rub in a little salt or powdered alum into the bars daily. Feed on soft food until well. It is generally advisable to give a pint of raw linseed oil, as the condition is frequently associated with indigestion.

Aphtha, or Vesicular Stomatitis.—An eruption of vesicles on tongue, lips, and sometimes round the muzzle.—See also page 26.

DISEASES AND IRREGULARITIES OF THE TEETH.

Toothache or Caries of the Teeth.—This is comparatively rare, but it is met with occasionally.

Cause.—May be due to an open space between the molar teeth becoming impacted with food, which undergoes decomposition inducing disease (caries) of one or other of the neighbouring teeth. Cracks or fractures of the "table" of the tooth sometimes form the starting point of the diseased process by providing lodgement for decomposing food material.

Symptoms.—Slow, careful mastication of the food, occasionally stopping suddenly, and dropping the bolus in the manger. In severe cases, the horse will stand hanging his head over the manger with a countenance expressive of pain, while saliva flows from his mouth. If the teeth be carefully examined it will generally be possible to detect the caried one by its smell, which is very fœtid.

If the teeth be tapped the horse will evince acute pain when the diseased one is touched.

Treatment.—Extraction is the only remedy, and that requires skill as well as proper instruments; the only alternative course is to clean out the space and stuff it.

Irregularities of the teeth.—These arise from uneven wear. In aged horses the lower jaw is often much narrower than the upper, hence the outer edge of the teeth of the upper jaw, and the inner edge of the teeth of the lower jaw become long and sharp, and injure the tongue and cheeks in the act of mastication.

Symptoms.—The horse stops suddenly in the act of chewing his food, drops the bolus out of his mouth, "quids," as it is called, and will be observed to hold his head a little to one side with his jaws slightly apart, owing to the pain which he has inflicted on either his cheeks or tongue. An examination will reveal the condition described.

Treatment.—Rasp down the sharp irregular edges with a proper horse tooth rasp,—an ordinary shoeing smith's rasp may do in an emergency, if used with care. There are sometimes other irregularities arising from uneven wear, such as the back or front molar tooth projecting up a considerable distance beyond the others. The front one is easily cut down by a chisel or a saw, but the back one requires an experienced operator to cut it off.

Parrot Mouth.—Old horses which have been constantly fed in the stable, have often very long projecting incisor teeth due to want of wear. In some cases the upper incisors project a long way over the lower, while the latter penetrate the flesh behind the upper teeth; in such cases the teeth must be reduced by a saw.

Parrot-mouthed horses are incapacitated from grazing satisfactorily, and should have their incisors reduced, if they have to get their living on the veld.

In all cases where there is slavering at the mouth, or a difficulty in mastication, the mouth and the teeth should be carefully examined.

CHOKING.

Substances becoming lodged in the œsophagus or gullet.

Causes.—Swallowing roots without proper mastication generally, but it may arise when the horse is fed on wheat or barley chaff.

Symptoms.—These depend somewhat on the particular part of the gullet where the obstruction is lodged. If near the throat, the horse will appear in great distress, pawing with his fore-feet, coughing, hurried breathing, slavering from the mouth, and occasionally he will draw himself up, arch his neck, and make a movement as if he were going to vomit. If the obstruction is in the cervical or neck part of the gullet, the symptoms are similar, but less acute and distressing. If the obstruction is in the chest or thoracic portion of the gullet, the symptoms are less pronounced, but there will be occasional attempts at vomiting, and if fluids have been administered they will be returned through the nostrils. There is a tendency to swelling of the abdomen in all cases of choking.

Treatment.—If the obstruction is in the throat, insert a balling iron, or gag, in the mouth, and endeavour to extract the obstruction with the hand; let someone press the object from the outside up towards the entrance to the gullet, while you try to catch it from the inside. If the obstruction is in the neck portion of the gullet, it can be both seen and felt on the left side. First, pour some oil down the throat, then try by manipulation to move the obstacle downwards. If composed of chaff, you may be able

to break it down. Hot fomentation may assist in relaxing the parts. If the obstacle is in the thoracic portion of the gullet, all that can be done is to give repeated doses of oil, or soapsuds, to try and lubricate the parts, and assist the movement of the obstacle. I would not recommend the passing of the probang in the horse to anyone but an expert, as it is a very dangerous operation to anyone not experienced to it.

GORGED STOMACH OR STOMACH STAGGERS.

This is a condition in which the stomach becomes so distended with food that it is unable to contract upon its contents, fermentation, and other decomposing changes take place in the mass of food, more especially if the diet has consisted principally of grain. The products of fermentation exercise a paralysing effect on the muscular coat of the stomach; stomach digestion becomes arrested, and derangement of the brain supervenes, which may end in acute congestion of the membranes covering the brain, effusion into the cranial cavity, delirium, coma, and death.

Causes.—A full feed, especially of grain or forage, immediately before being put to severe or fast work, or over-feeding immediately after returning from a day's work, especially if the animal is exhausted by a long fast. It frequently arises, also, from the animal getting to the corn-bin and eating an over-feed of grain, and in this Colony it is very often associated with chronic dilatation of the stomach, or chronic disease of the liver.

Symptoms.—The horse becomes dull and drowsy looking, and manifests symptoms of abdominal pain or uneasiness; he hangs his head in an extended position, and moves about his box in a stupid, heedless manner. These symptoms gradually become more pronounced, he becomes more restless, paws with his fore feet, rests his head on the manger, or stands pressing it against the wall; knocking it against any obstacles with semi-indifference. If let out, he will wander about with his head hanging down, with a heedless, staggering gait, until he becomes quite delirious, when he plunges about in a violent manner, with trembling of the muscles, and apparent blindness. If he tumbles down, he may continue his mad struggles until he dies exhausted, or if kept quiet in a loose box he may become quite comatose and die without a struggle from twelve to twenty-four hours after.

Post mortem appearances.—In some cases the stomach is found ruptured and its contents in the abdominal cavity. It is this fact which has given rise to the opinion, so universally held in this Colony, that the "bots," which are usually present in considerable number, have eaten through the walls of the stomach, and caused the death of the animal. In the great majority of cases, however, the stomach is not ruptured, but distended to its utmost capacity with a sour fermenting mass of food. This sour condition of the stomach may be detected before death by placing the hand in the mouth, and smelling it when withdrawn. The mucous lining of the stomach is generally thickened and covered with a thick viscid mucus, especially at the pyloric or bowel end.

In addition to the condition of the stomach the liver is frequently affected. Sometimes there is chronic hardening with enlargement of the organ, in other cases it is atrophied and has a tough, leathery consistency. On opening the brain the covering membranes are generally congested with more or less serous effusion into the cranial cavity and about the junction of the brain and spinal cord (the *medulla oblongata*). In some cases I have seen acute inflammation of the membranes covering the brain and such a quantity of fluid as to cause a blanched appearance of the brain substance, evidently from the pressure.

Treatment.—This is very unsatisfactory, especially in cases where a great quantity of grain has been eaten, or when it is complicated with chronic disease of the liver. Give at once a strong purgative, 5 to 6 drachms of aloes, combined with 1 drachm of nux vomica, followed every twelve hours by nux vomica 1 drachm, carbonate of ammonia 3 drachms in a pint of chilled water (not warm); 2 grains of strychnine may be used instead of the nux vomica, but watch carefully for any twitching of the muscles, when either must be stopped at once. Assist the bowels to act by giving injections of turpentine 2 ounces mixed in linseed oil half a pint, every four hours. In milder cases a strong stimulant is all that is required, such as whisky or brandy a pint bottleful, and cayenne pepper a teaspoonful, in a pint of water, or powdered gentian root ½ ounce, ginger ½ ounce, carbonate of ammonia ½ ounce in a bottle of water. Hand-rub the abdomen and when the brain symptoms appear, apply cold water to the head.

GRASS STAGGERS.

Cirrhosis of the Liver.

Molteno Horse and Cattle Disease.

This disease is very similar in its character and symptoms to the preceding, but it occurs in horses which are fed solely on the veld, and have scarcely ever been inside a stable. It is most prevalent on the sour grass veld where the vegetation is coarse, and where the horse requires to eat a greater bulk of food to get sufficient nourishment thereby distending the stomach unnaturally. In these high sour veld districts, chronic atrophy of the liver is very common. The disease is much more prevalent on certain farms in the same district than on others, and it is even more prevalent on certain parts of the same farm, clearly indicating that the vegetation has a great deal to do with its origin.

Cause.—Whilst in some cases a condition of gorged stomach and its attendant train of symptoms may be due mainly, if not entirely, to mere distension of the stomach with bulky innutritious herbage, the disease here described has now been proved to be due to the ingestion of an irritant toxic principle contained in a plant found where the disease occurs. This plant is known as

Senecio latifolius, and resembles the "ragwort," "St. John's wort" or "Staggerwort." The effect of taking in this plant whilst grazing is to induce a train of symptoms very similar to those already described under gorged stomach, but on the *post-mortem* examination of animals which have succumbed to the malady, in addition to the distended stomach, constant changes are encountered in the liver, this organ being found atrophied (wasted) hard, firm, dense and tough. In structure a considerable part of the organ has been replaced by fibrous tissue, which has formed as the result of the irritant effect of the injurious principle contained in the plant already mentioned. Feeding experiments conducted with this plant invariably resulted in the appearance of the disease after a more or less lengthy period depending upon the quantity administered.

Under natural conditions of grazing, the disease is produced but slowly. From the time when an animal first commences to take in the poisonous plant with its food, one or many months may elapse before the first appreciable symptoms become apparent; the length of time required depends of course upon the quantity of the plant daily ingested, and in the same connection, also, upon the prevalence or scantiness of the plant in the particular grazing area.

It must be mentioned, however, that the plant seems especially toxic when in the young state.

Symptoms.—These are very similar to those of gorged stomach already described, but the progress of the disease is much slower and the symptoms rarely so violent, until the last stages. I have seen some cases continue in that sleepy, dull staggering condition for more than eight days. One case which I attended, when I put it in the stable, cleared out the bowels, and fed it on bran and forage, apparently recovered, but a few days after, when again let out to graze, the symptoms returned, when the treatment was repeated, with equally satisfactory results apparently,—the patient ultimately died on the veld after being ill for nearly three weeks.

Treatment.—When well marked symptoms of the disease have appeared, medicinal treatment is unsatisfactory. When, however, the disease is detected early at its commencement, the best course to adopt would be to immediately remove the animal to a stable, and there feed on dry forage, oats, mealies and hay.

In such cases the treatment is similar to that given for gorged stomach, and consists principally in the administration of purgatives, injections of turpentine and oil, and nerve stimulants. When over the acute stages of this complaint, the following powder should be mixed in the food daily, or given by the mouth:—Powdered gentian root, ½ ounce; powdered nux vomica, ½ drachm; bicarbonate of soda, 1 ounce, and feed on small quantities of good rich food for some time after to prevent the stomach from again becoming overloaded until it has regained its normal tone. Unless some care can be exercised in that respect, it is rare that a permanent cure can be effected.

In conenction with this disease, the report of Veterinary Surgeon Dixon, for the year 1906, contains the following statement:

"Stomach staggers and Cirrhosis of the Liver is the cause of "great loss amongst horses all through my area (East London). "Horse breeding is practically impossible owing to this disease, as "mares, after grazing two or more years on the sour veld, usually "contract the affection and die. I have no doubt the cause is due "to some plant or plants which are eaten and which produce "their actions slowly.

"The *Senecio latifolius*, a plant which has been experimentally "proved to kill horses showing symptoms similar to those of "Stomach Staggers, grows profusely all over my area. I recommend first giving a purgative of calomel, 2 drachms, and raw "linseed oil 1½ pints; turpentine, 2 ounces; followed by four "balls each containing 6 grains of arsenic and one drachm of nux "vomica. One ball to be given morning and evening."

Farmers, in the belief that the disease is due to bots, administer large doses of the carbolic dips, arsenic, strychnine, etc., and believe that the success of the medicine is due to its effects in expelling these larvæ. It is not so, however, any good effect these remedies may produce is due to their antiseptic properties arresting the fermentation and decomposing change in the stomach.

It is quite certain that "bots" are in no way responsible for the causation of this malady.

SPASMODIC COLIC, GRIPES, OR BELLY-ACHE.

Causes.—It is spasmodic contraction of a portion of the small intestines, due to the presence of an irritant, such as indigestible food, irritating substances of any kind, or to a large drink of cold water, when the animal is warm.

Symptoms.—The attack is sudden, the horse will stop feeding, stamp with his fore feet, kick his belly with his hind, whisk his tail, look round at his flank; he will then move about very uneasily, crouch with his hind legs under him, attempting to lie down, then all at once he throws himself down, and gives a prolonged groan. When down, he will roll over and over, lie on his back perhaps for a little, and after a few minutes of violent struggling, get up again, shake himself, and commence to feed. In a longer or shorter time, another spasm comes on, when he repeats the same performance. In very bad cases the spasms will follow each other very rapidly, and if not relieved, end in inflammation of the bowels, when the pain becomes continuous. In milder cases, after a few spasms, the interval between each becomes longer, and the spasms milder, until they disappear.

In violent cases of spasmodic colic, profuse perspiration will break out all over the body during the spasm, but the coat dries again very rapidly, when the spasm is over. The horse makes frequent attempts to urinate but passes but little urine, hence many men are led to conclude that the disease is in the kidneys or bladder, but the symptom is simply that the horse makes every attempt to relieve the intense pain which he is suffering. The