

farmers can combine for the purchase of one thousand or twelve hundred yards of screen to cope with small swarms. According to Mr. L. J. Roberts, of Fort Beaufort, whose letter was reproduced in the *Argus*, November 3, 1892, the cost is about £2 per hundred yards. Of course he uses calico; but light sail-cloth, of cotton or hemp, will be found to be more lasting, and will therefore be cheaper. We have, unfortunately, the locusts with us for some time yet, and I fully expect that unless general and systematic action is taken at once, we shall have to use as they do in Algeria 10,000 Cyprus apparatus, each 55 yards long, and 100,000 sheets of iron with a proportionate number of pegs, ropes, hammers, spades, &c., not a very pleasant prospect, indeed.

I am glad to see that the screen system has been adopted by the Farmers' Associations of Sunday's River and Bedford, and that they urge the adoption of the same method throughout the Colony. Any system of destruction by which a certain number of voetgangers is destroyed is commendable, but if you wish to work systematically and surely, use the screen system.

The locust, as soon as it has shed its sixth skin, is now ready to procreate and help to multiply its kind. To wage war against it, when in that state, is a hopeless task. A swarm may sometimes be turned from a field or a garden by smoke or noise, and an amusing instance is given by H. M. Consul at Tunis, I believe, of a swarm driven back by a company of French soldiers told off for that work. Every man was provided with a paraffine tin and a stick, and drummed such a tattoo that even the locusts could not stand it and were driven back. In cold weather, heavy logs can be used successfully for crushing the winged locust, when benumbed by the cold. Setting fire to the copses where they have taken shelter at night is of course also beneficial. But as I have stated before, it is when in the winged state that it is necessary to follow these flying swarms, to note and beacon the places where they have remained, to ascertain whether they have laid their eggs or not, and lastly to estimate as accurately as possible the area of the egg-deposits. There is nothing more for me to say about the locusts. On the amount of energy and intelligent direction of operations against the plague, above all in the co-operation unselfish co-operation, of the farmers in the afflicted districts of the Colony, or perhaps beyond, success to a great extent depends. It is not a question of money only, it is a question of moral persuasion and energy. The locusts are no more a visitation of Heaven than the phylloxera, the plague, or the murrain. That they can be successfully coped with is now a matter of notoriety. Co-operation of the farmers is the thing just needed, this will lead assuredly to Government aid. There is no difficulty connected with the process of destruction and no technicality. It is simply dig up the egg-pods and entomb the voetgangers. Never was the adage "Heaven helps those that help themselves" more truly illustrated than by the existence of the natural enemies surely provided by Providence for man's assistance in compassing the destroyer's destruction.

#### FOOT-AND-MOUTH DISEASE.

A Paper read by MR. FESTIRI SOGA, Veterinary Surgeon, at a meeting of the Koonap Heights Farmers' Association.

With the advancement of civilisation new diseases advance; in the opening up of Central Africa two great plagues are going apace, and one now on the eve of entering our Colony, both extremely virulent, one amenable to treatment, the other not. Veterinarians of Great Britain, Germany, Austro-Hungary, and France have been baffled in the treatment of that dire scourge *Rinderpest*, or cattle plague, which is now slowly but surely wending its way in a south-easterly course for Cape Colony.

Should proper measures fail to be taken by the neighbouring States and on the Colonial Boundaries we may expect as a consequence, by our neglect in allowing the disease to gain access and a strong foothold, total devastation of our herds. I make bold enough to say, that more than two-thirds of Colonial cattle will succumb to its ravages.

It will be more, however, to the point of this communication if we confine ourselves to our nearest enemy, which we may expect in the near future, namely, *Foot-and-Mouth disease*, technically termed *Aphtha Epizootic*, *Vesicular Epizootic*, or *Eczema Contagiosa*. This disease may be described as a contagious eruptive fever, affecting cattle, sheep, goats, pigs, fowls, "warm-blooded animals generally," even including man amongst its victims. It is due to a specific organism, in other words, a germ or microbe, a body of microscopic dimensions cultivated in the system of the animal, and capable of being carried from one animal to another by contagion and infection. There are many ways by which the disease may be carried from one herd to another, or from one district to another; this can be done by men, dogs, domestic fowls, birds, "the spreeuw for example, which is constantly with sheep and cattle," vermin, including jackals, hares, &c. As dead or unconscious germ-carriers or *Fomites*, I may mention wagons, carts, hurdles, bricks, skins, horns, and railway trucks, indeed every moveable thing capable of retaining the germ by its porousness. Although carried from one part of the country to another by numberless bearers, the germ of itself is not capable of crossing a small river or hedge, it can only travel a very short distance by aid of wind, when on reaching the ground there it remains. Fortunately, whilst I was in Edinburgh during the outbreak of 1882-3, I had an opportunity of seeing foot-and-mouth disease in its various lesions, that is, its morbid conditions and development.

The incubative period, or time in which the poison may remain in the animal system before the typical indications of disease become noticeable, is from one, two, to three days and never more than six days, showing that it is somewhat easy of prevention, differing in this respect from lung-sickness and redwater in the shortness of its incubative period.

*Symptoms.*—The usual symptoms in cattle are staring coat, shivering, excessive temperature—the thermometer in many cases reaching 108° Fahr., cracking of the muzzle from high temperature, mouth red and hot, surface of the udder and teats also red and hot. As the disease advances blisters, which look like little bladders of skin, appear on the surface or mucous membrane of the mouth and tongue, between the cleft of the hoofs, and in cows on the teats; eventually these blisters burst, leaving raw red surfaces upon whichever part they may appear, having a peculiarity of rapidly coalescing, or meeting together and extending; should this not be checked the whole surface of the mouth and tongue becomes raw, the teats crack, and the hoofs drop off. The extension of these blisters on the hoofs may be from between the digits upwards and forwards, or from the front upwards and backwards to the junction of the skin and horn; should this extension be neglected the pus or matter burrows between the horn and sensitive foot, as a consequence the hoof is cast; this may be on one digit only.

With sheep and goats the first noticeable symptom is whilst they are feeding: should the lesion be on the fore feet the animal kneels; if on all four feet, persistent lying with no inclination to rise. The mouth and tongue have the same appearance as in cattle; unfortunately separation of the hoof invariably takes place.

In pigs, champing of the jaws, and a continuous-flow of saliva from the mouth (frothing); when dressing or dosing care must be taken, or the hoofs come away in one's hands.

In fowls the blisters are seen at the junction of the claws and skin, on the comb, mouth, and tongue, which as in other animals form sores.

*Treatment.*—Fortunately this is simple, but it entails a commodity or commodities which are wanting in many districts, without which the treatment in the majority of cases will fail: that is, an abundant supply of green food; this by all means is necessary, as in many instances when hundreds of small and large stock have to be fed daily which cannot rise and search for food, tubers and green food come in handy, turnips, carrots, mangles, green barley, indeed any green food. Forage and hay in the early stages have an irritating effect on the animal, tending greatly to increase the malady.

In the first stages the internal administration of Epsom salts, one pound, in 3 quart bottles of water; followed up by twice daily for a few succeeding days in the drinking water, Epsom salts 1 ounce, hyposulphite of soda  $\frac{1}{2}$  ounce, chlorate or nitrate of potash 2 drachms.

As a mouth wash (I may here give a few of the most common): (1) Borax and tincture of myrrh each 1 ounce, water 1 quart; (2) Carbolic acid 1 drachm, vinegar 1 pint, water 1 pint; (3) Borax 1 ounce, alum 1 ounce, water 1 quart. These formulæ may be used in the case of sheep, goats, and pigs.

To the teats apply, (1) Tincture of myrrh 1 ounce, glycerine 10 ounces, twice a day; (2) Permanganate of potash 20 grains to the quart of water; no carbolic preparation should be used as an application to the teats, as the milk will become tasted.

As an application to the feet, after thorough washing and poulticing, where necessary, sulphuric acid 1 ounce, water 4 ounces, to be supplied with a feather to the abraded surfaces; having dressed the feet apply a bandage previously well saturated in Stockholm or Archangel tar.

This, gentlemen, is concisely the nature of foot-and-mouth disease, its symptoms and treatment; there are many other formulæ in use, these are the simplest and best, and should the farmers take trouble to attend to their cases at the commencement, serious results will be arrested, such as a six to nine months' treatment of lame cattle, until the hoof has regained itself.

One word, with your permission, upon the *post-mortem* appearances, and the use of the flesh. In all ordinary cases there are no lesions to be observed in the carcase, blood, or internal organs, other than in the mouth, feet, &c. In bad cases we have the flesh flabby, and it does not set properly, dark in colour often, and having an effusion under the skin of a watery blood appearance (magenta colour); these conditions are only found in neglected cases. The only internal lesions we may find will be small vesicles on the mucous membrane of the air passages. In the first stomach (*groot pens*) we find ulcers on the internal surface, oval in shape and raised above the level of the natural surface; third stomach (*blaar pens*), there are no ulcers, but between the leaves there are patches or blotches having a congested appearance; fourth stomach or *molk pens*, at the pyloric orifice, or lower opening of the stomach, we find small ulcers, about the size of a castor-oil bean, dusty in colour.

As regards the use of the meat there is no danger in using it only the head, feet, and stomach must be condemned, the milk can also be used with impunity if boiled.

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### Rinderpest.

*Cattle Plague, Contagious Typhus, Steppe Murrain*, are a few synonyms by which our new Colonial enemy is termed. In giving an idea of its vitality, let it be understood that lung-sickness and redwater are simply fools to it. Termed Rinderpest by the Germans, the word signifies disease of the ox, and originates in the steppes of Russia and Kherson District. Every attack of cattle plague that Britain has suffered from, has been introduced from Russia, indirectly from Germany, Turkey, Egypt, and Schleswig-Holstein.

The disease is an enzootic affection (attacking the lower animals), and wherever the Russians are engaged in war, so sure cattle plague follows. Rinderpest is well known in India, China, Tartary, and Mongolia. Not only is it indigenous to the ox, but it affects sheep, goats, and other ruminants; the latter animals, however, never suffered so severely as cattle, the disease being in them less contagious and less fatal.

As in redwater, rinderpest once having passed through a country, those animals which grow up in infected soil undergo a natural inoculation or immunity to the disease, neighbouring or foreign cattle when brought into the area invariably die; these naturally inoculated cattle are capable of disseminating the disease to healthy, although they of themselves are not liable to cattle plague.

Rinderpest may be defined as: an eruptive fever of a most destructive type the lesions or manifestations of the disease being localised in the skin and mucous membranes. Strange to say, the disease was once looked upon as being a small-pox in cattle and by some as a typhoid affection; it undoubtedly resembles small-pox in the human subject. The *actual cause* of rinderpest is "as described by a Surgeon Semmar." an organism of a globular shape, gradually lengthening into a staff (*bacillus*) possessing great vitality, shown conclusively from experiments which have taken place, animals having been inoculated from the earth and decomposed carcase many months after. The germ can also be kept in an active state in the mucous discharges from the nose and eyes for many days, having been known to remain active for a period of three months.

Its dissemination resembles that of foot-and-mouth disease, the extraordinary methods being by the flesh of dead animals, mucus from the nose and mouth, and the discharge from the eyes.

Fortunately, cattle plague never spreads far through the medium of the atmosphere like horse-sickness, a ditch or brook is said to be enough to stop its progress.

*Fatality.*—It is the most fatal of all diseases that cattle are heir to; very few animals recover, indeed not more than from 5 to 7 per cent., and very few escape it. Its duration may be put down at from a few hours to 4 or 5 days; should an animal get over the sixth or seventh day it may be looked upon as safe; the usual duration is 36 hours to 5 or 6 days. Many animals may die suddenly and show comparatively few external symptoms. By ingestion the natural incubative period is about 4 or 5 days; by inoculation it is much shorter, being about 2 days, rarely if ever extending in either case over 10 days. The nature of the lesion or manifestation is simple granulo-adipose degeneration of the superficial cells of the tissues generally, skin, &c. It does not always manifest itself in the same manner, as in some cases nervousness is apparent by trembling, spasm, and much excitement, even delirium and shivering; in other cases it comes on as an enteric affection with bloody purging; at other times well marked skin lesions. The warmer the climate, strangely enough, the greater and more severe the skin symptoms.

In the early stages of cattle plague the temperature runs high, from 105° to 107° Fahr., indicating excessive fever, the animal appears dull, its normal functions are impaired, and markedly interfered with, it is stiff, arching of the back, feet drawn together, coat erect, bowels constipated, fæces of a dark colour, often coated with blood, great tenderness across the loins and back tendons, shivering, and twitching of the muscles of the flank and face. As the disease advances constipation gives rise to relaxation of the bowels and finally to dysenteric diarrhœa, the fæces have a sickly odour and in the operation of their passing, there is inordinate straining, and it is no uncommon thing to see half a foot of the rectum displaced (everted) being intensely red in colour, colicky pains are also present.

The urine is usually scanty, high coloured, and laden with