

NOTES ON THE CATTLE MURRAIN OF CEYLON.

I am of opinion that the virulence of the disease is not developed before the first well-marked symptoms are capable of being noted.

I most fully endorse all that is here stated as to the highly contagious nature of this disease, and the very many and heretofore unthought of means of conveying and propagating the disease.

Having been well aware of the highly-insidious nature of the disease for many years, and having possibly bred and reared more stock than any other individual during my period in the Island, I say with considerable confidence that I have safeguarded the herds under my care, and never once had an outbreak of the disease, although the very animals conveying food for the stock have been subjected to the disease and died on the public roads. I have been laughed at for the precautions I have taken, but most confidently assert, that, until the necessity for all and every possible precaution be recognized by the Ceylon Government, and most strictly taught and enforced, their efforts to arrest outbreaks of rinderpest will be a waste of time and money.

The earliest symptoms should be diagnosed, and immediate and unremitting means taken to stamp out the disease, while there should be constant watchfulness for its first appearance by a ready staff of trained and educated men belonging to an Agricultural Department embracing the length and breadth of the Island. No great scientific knowledge is in this case required, but a sound liberal agricultural education, which should embrace a knowledge of stock, and the diseases they are liable to; and most especially should these men be trained to deal promptly with outbreaks of disease, as a well-trained fire brigade would on the first outcry of fire.

It is quite a common mode of dissemination for the disease to be conveyed for many miles by animals seemingly healthy and there communicated to others, thus causing a fresh outbreak.

I have not seen the disease in sheep and goats, but have been assured by natives living adjacent to forests where deer abound, that during severe epidemics, deer are attacked and die in large numbers.

I have no experience in inoculation but have a case fresh in my mind where I considered protective immunity came in:—A pair of cart bullocks were purchased and bought from Colombo to this district—they were warmly housed and well fed and attended to. About ten days after their arrival they were found to be ill, and having been asked to look at them, I found in both animals well-marked symptoms of rinderpest. There being no convenient building into which they could have been removed, they were allowed to remain in the room I found them in, only separated by a wall a few feet high from an adjoining room where some six cows and their calves were stalled. All that was done to further separate the sick from the healthy was to fill up the open space between the wall and the roof by a double fold of coir-matting. Then the following preventive measures were taken, viz:—A strong solution of Jeye's disinfectant was made up and freely sprinkled over every part of the house, the animals, and even the coolies in attendance. This was kept up day

and night while the disease lasted, and the animals may be said to have lived in an atmosphere of the disinfectant. The cows and calves in the adjoining stall were also freely sprinkled, and the atmosphere kept highly charged. No treatment was employed farther than rice conjee with treacle while the animals could not eat. Their mouths were well washed daily with a solution of the disinfectant. The disease in the two bullocks ran its course. The usual discharge from nose, mouth and eyes, and purging were well marked as all other characteristic symptoms. Both recovered, but one made a bad recovery. I considered that the disease was developed in the bulls as they were working in a cart—it being monsoon weather. Not one of the cows or calves was attacked, although two of the cows had come along with the bullocks in the same trucks from Colombo.

THE VACCINATION OF LAND.

The *Public Opinion* of October 12th republishes an article from the *American Architect* with the above title. The researches into the action of "bacteroids" found in the root tubercles of certain plants supported the possibility of soil-inoculation by these organisms, with the result of naturally increasing the amount of nitrates in cultivated land, and so reducing the expenditure on nitrogenous fertilizers. There is no doubt that cultivators of the soil have for hundreds of years past recognised the beneficial work of these nitrifying organisms without at the same time identifying them as the cause of the results these same cultivators appreciated. To explain the influence of certain leguminous plants on the soil,—bringing it into a condition fit for the growth of nitrogen-consuming crops,—it was first thought that the nitrogen imported into the soil by the leguminosae was got by the leaves from the atmosphere; but this theory was abandoned for the explanation that the nitrogen was brought up from the subsoil by the long roots of these particular plants. Next came the discovery of the "bacteroids" contained in the root-tubercles, to which we must now attribute the credit of working up the atmospheric nitrogen into nitrates. Of late further light has been thrown on this subject, and we now learn that the tubercular growths found on the roots of plants which harbour "bacteroids" appear only when these plants begin to feel the want of nitrogenous food in the soil,—in other words, when the soil cannot supply the plants with assimilable nitrogenous compounds. We may thus infer that a tolerably fertile soil, or one furnished with the average amount of nitrogenous material, will not be benefitted by the action of bacteroids, so as to have that amount increased, since the root tubercles do not occur on plants growing on such soils. It is only when the plants find themselves starved of nitrogen owing to the low fertility of the soil that the outgrowths capable of fixing atmospheric nitrogen are developed. In fact these tubercles may be looked upon as a form of disease brought on by nitrogen-hunger; but most strange of all, it is this very disease which is the means of supplying to the soil that which it lacks,