

pulse becomes very feeble and thready, the respiratory movements are modified, and the animal sometimes shows such weakness in the limbs that it has even been thought that some special paralytic affection of the spinal nerves must exist. The temperature now rapidly falls, and signs of a great diminution in the normal chemical changes in the body appear.

Death usually occurs on the following or seventh day from the first perceptible elevation of temperature.

Although this is given as the typical course of the disease, there are great deviations from it, as some animals live a longer, many a shorter time, and the severity and sequence of the symptoms vary considerably.

The causes leading to these symptoms, or, in other words, the reasons why these alterations from health occur, may be thus stated. A peculiar agent causes first of all a morbid state of the blood. Coincident with the first elevation of temperature, and, of course, long before there is the least outward appearance of ill-health, the blood of an animal which has taken the cattle plague contains an agent which can produce the plague in another animal. In other words, the earliest fact which can be made out after infection is, that the blood contains the poison of the disease, so that serum obtained from it will give the disease by inoculation.

This fact, ascertained by Dr. Sanderson, is the most important pathological discovery yet made in the cattle plague. It is pregnant with consequences in medical doctrine, for though the existence of a similar fact has been long suspected in several human diseases it has never been proved in any. So material, indeed, is it, that we must dwell on it for a moment. The poison contained in a minute portion of the mucous discharge from the eyes and mouth of an animal ill with cattle plague, if placed in the blood of a healthy animal, increases so fast that in less than 48 hours, perhaps in a far shorter time, the whole mass of blood, weighing many pounds, is infected, and every small particle of that blood contains enough poison to give the disease to another animal.—This at once accounts for the rapid spread of the cattle plague. The agent is multiplied to a large amount in a very short space of time. How soon after the poison is put into the blood the animal becomes capable of giving the disease by natural infection to other animals, is not determined; possibly not until those parts of the body which can give off products to the air become impregnated with the poison. At what time the blood and the textures cease to be able to give the disease, is also not determined; nor, when the poison mixed with mucus or with serum is exposed to the air, can a definite

time be named when its energy is destroyed.*

As far as we can judge, the elevation of temperature, or (to use the usual medical term) the fever, begins when the poison has infected the whole mass of blood, *i. e.*, within from about 40 to 60 hours after its first entrance into the system.—At the same time the chemical changes in the body are augmented, and one of the ultimate products of disintegrated tissue, urea, is, according to Dr. Marcet, largely increased in amount. Soon afterwards (the time cannot be stated with precision), the blood is otherwise altered, the amount of fibrine is largely increased, the amount of water is lessened, and possibly the physical condition of the albumen may be altered, if we may judge from the change which Dr. Marcet observes in the diffusibility of the albumen of the muscles. According to Dr. Beale, the proportion of soluble substances is also largely increased.

The next phenomenon which can be observed is an alteration in the circulation. Almost everywhere, but more especially on the mucous surfaces and on the skin, there occur on the third or fourth day local congestions varying in size and intensity. In many places obstructions occur, and coagulations of blood in the capillaries: and in some cases the blood becomes quite stagnant.

A great increase of granular matter is found to take place both within and outside of the vessels of the affected parts. The capillary vessels themselves are greatly enlarged, and the spaces between lessened or even obliterated. At the same time a considerable nutritive alteration goes on in the mucous membrane and skin, which leads to very rapid and imperfect growth of many of the cellular elements, and this is followed by a rapid disintegration and detachment in the form of discharges. As that portion of the mucous membrane which is most essential for the digestion of the food is most affected, the appetite soon fails, rumination ceases, and large accumulations of undigested fodder are met with in the first stomach. In many cases the villi of the small intestine are so destroyed, that even if food were taken it would scarcely be absorbed in sufficient quantity to maintain life, and hence the rapid exhaustion, failure of the heart's action, depression of the animal heat, and general sinking of the powers. In some cases, when the process is more superficial, the membrane recovers its former structure, and that rapidly, and it is curious to find that one

* When carefully protected the mucous discharges have occasionally retained their power of giving the disease by inoculation for no less a time than seven months, according to Professor Jensen of Dorpat. Ravitsch also has kept the poison for seven months.

affected may be healing while another is just beginning to suffer.

When, as sometimes happens, the mucous membrane most affected by the congestion is that of the lungs, the phenomena are not less severe; indeed, the disease is sometimes even more quickly fatal. A slight cough is soon followed by accelerated breathing, which rapidly increases; and not unfrequently the difficulty becomes so great that some of the air vesicles are broken, and the air passes into the cellular tissue between the lobules, and from this it reaches even the subcutaneous textures of the back. This is believed by Dr. Bristowe and Dr. Sanderson to be the cause of the emphysema which they fully describe.

Reviewing this train of symptoms, it appears that the amount of fever, that is, the extent of the rise of temperature, does not constitute the danger of the disease; in some of Dr. Sanderson's cases the temperature was higher in beasts which recovered than in others which died. The true measure of the danger should rather, it seems, be sought in the changes in the nutrition of the digestive or respiratory mucous membranes, or in the failure in muscular contractility.—This latter condition is itself probably in part a consequence of the former, though whether it is entirely so we are not prepared to say.

Whatever may be the cause of these very general congestions and nutritive alterations, the remarkable fact obtains that poison is present in the discharges from the mucous membrane, and hence at this period the beast is most highly infectious. The matter runs down the hide to the floor or woodwork, and when dry may be carried as dust in the air, and infect other beasts when received on the absorbing surfaces of the eye, nose, mouth, lungs or stomach.

JULY MEETING OF THE FRUIT GROWERS.

The following certificates were awarded at the Exhibition of the Fruit Growers' Association, held at Wolfville on the 11th inst. :—

CHERRIES.

- 1st Class Certificate—Dr. Hamilton for four varieties.
- 2nd Class Certificate—Geo. V. Rand.
- 3rd Class Certificate—Richard Starr.

STRAWBERRIES.

- 1st Class Certificate—Dr. Hamilton for three varieties.
- 2nd Class Certificate—Geo. V. Rand for seven varieties.
- 3rd Class Certificate—Isaac Shaw for two varieties.

LAST YEAR'S APPLES.

- 1st Class Certificate—Robt. W. Starr for six sorts.