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## VARIOLA IN SHEEP.

[Communicated for the Boston Medical and Surgical Journal.]

[THE following communication, from Dr. Benj. Cushing, of Dorchester, is of interest in connection with the history of variola. It was written by Dr. Thomas Thaxter, of Hingham, so long ago as 1811, in the form of a letter to Hon. James Bowdoin, and is of value as showing the progress of this disease as it appears in certain of the lower animals. It will be noticed that, as in man, it was considerably modified by inoculation. The subject has recently been noticed in a number of the London *Lancet*.—ED.]

HONOR'D SIR,—Having perused the treatise you were kind enough to send me last winter, I ascertained that the flock of merino sheep which my son sent me, and which were late from Lisbon, had gotten the species of smallpox among them peculiar to sheep; the progress of which disease, and the observations made, I will communicate to you, as far as I am able.

The disorder is as distinctly marked in the sheep as the smallpox is in man. Three kinds were observed, viz., the distinct, the confluent, and the purple. The infection was communicated from one to the other in the same manner as with human beings; from coming within the atmosphere of each other at an advanced stage of the disease (at which time they have a peculiar smell); or from being within the same pen; or from feeding at the same vessels, before they were cleansed, which the sick sheep had used. I found the disease discovered itself from the twelfth to the fifteenth day after receiving the infection in the natural way.

The first symptoms of those with the purple variety were so rapid that they could scarcely be marked from one stage to the other; but they every one appeared to be much swollen all over, with hard and laborious breathing; and they died very soon, with a dark appearance of the skin, similar to that in man.

The confluent and distinct varieties were more marked, and gave greater opportunity for observation. In the first attack, the sheep

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inclines to a solitary place in the yard, and keeps working her mouth and tongue, as if tasting some disagreeable substance. But, though not inclining to ruminate, she will not altogether refuse food. She soon begins to rub her head against the fence or wall, and to have a discharge from the nose, like those first affected with a cold. The eyes appear swollen, the ears fall, the head hangs down, while the body is generally drawn up. In about three or four days, sometimes not till the fifth or sixth, they pretty much refuse to eat, and then appear to have very sore mouths and throats, so that eating must be very painful. They are very thirsty, and, after drinking, manifest considerable distress, especially if allowed to take more than a pint.

An examination of those with the confluent kind discovers spots, from the size of half a dime to that of a dollar, risen on the skin somewhat like a ringworm, vulgarly so called, but without inflammation or contained fluid; nor did these spots in my sheep ever appear to have much, though some of the patients lived to the ninth or tenth day. At this advanced stage of the disorder, there was a copious discharge from the nostrils, of a mucus, sometimes white and sometimes yellowish.

The symptoms of those with the distinct kind were at first much the same, only less in degree. About the third or fourth day, the pox might be discovered in hard, prominent red pustules between the shoulders and breast, on the dugs, and also on the tail. In three or four days more, these pustules appeared flattened, and to contain a fluid; but, on opening them, you would be disappointed as to the quantity, seldom being able to obtain a drop where you might have expected several. These pocks would afterwards produce a dark scab, which would remain a number of days before separating, and would be found all over the sheep, among the wool, causing it to fall off after a while.

A few of the sheep that had the distinct kind mildly, after three or four days, would ruminate at times; but seemed to have exacerbations of the disease, which they expressed by uneasy, restless motions, as if in pain. Several of the sheep, while the disorder was in progress, and others, after it appeared to have subsided, would be taken with a paralytic affection of the limbs. The lambs especially would sometimes be attacked with this affection as the first indication of their being ill. The sheep, throughout the whole disorder, had great sensibility to being handled, and, particularly, to being pulled by the wool; and, during the last stages, inclined to huddle together, as if for additional warmth.

I tried several methods with them, such as early bleeding, purging with neutral salts, administering castor oil, senna, and thorowstock, with glysters; but without any permanent effect. In some instances where the sheep appeared costive, these remedies gave temporary relief; but, in general, the alvine and urinary evacuations were performed without artificial assistance. I also used blisters between the shoulders and breast, applied onions to the throat, and gave wa-

ter-gruel and teas made of mullin, saffron, juniper, &c., with injections of vinegar and oil into the nose to increase the discharge, but found little satisfaction from any mode of treatment.

I had a merino ewe, imported in November, which lambed on January 27th, having a good udder of milk, and a healthy lamb. On the 30th—making between eleven and twelve days from the time of her being among the diseased sheep—she began to exhibit signs of indisposition. She soon refused to nurse the lamb, and appeared to have her bag hard and swelled, as if with milk. The lamb died Feb. 6th, and the sheep the 7th, making between twenty and twenty-one days from her first being where the disorder was. In February, I first discovered that the disease had got among my native sheep. Nine out of twenty-two ewes were taken within two days, six of which died—one in twelve hours, one in thirty, and one in forty-eight, after first discovering them to be unwell. The others lived—one nine days, one sixteen, and one, after losing both eyes, expired on the thirtieth. Of the two last, one—on being opened—was found to have had a suppuration near the base of the heart, the other a suppuration in the lungs, which I have found to be the case, on dissection, in a number that had got through the pox, but died in some three months or more afterwards, having ulcerations of the lungs and hydatids in the liver, with tubercles frequently interspersed with both, which tubercles were disposed to form, some with water and some with pus.

My first endeavor to stop the disorder among the sheep, was to separate the well from the sick, placing those supposed to be healthy in healthy barns. But whether my man who attended to this duty carried the infection in his apparel from one barn to the other, or carelessly brought some of the vessels that the sick sheep had eaten from, to feed the well in, I cannot say; but when I thought a stop was put to the disorder, from the well sheep having been more than fifteen days without any indications of sickness, all at once four new cases were perceived to occur, three of which terminated fatally, from the fifth to the ninth day. During this time, I found two sheep which had the distinct kind in so mild a manner as hardly to be perceived; and accordingly removed them before I thought they had communicated the infection to the remaining number, which was seven; believing that, in case they had received the infection, they would all die, as they were near the time of lambing.

At this point, I took matter from the pox of the infected sheep, and inoculated the well ones, some of which lambed just before, and others soon after, breaking out. The lambs, twelve in number, I inoculated at three or four days old. All, lambs as well as sheep, did well, and have not since appeared to pine, or to be in any way disordered, although I did not do anything for them, except to keep them carefully as to air and diet. The sheep, excepting in one instance, did not appear to have the symptoms upon them more than two or three days. After this time, they would eat and ruminate

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naturally and freely. Some, one would never perceive to have the disorder but from the circumstance that their incisions contained a good pus, and from finding a few pustules upon them, after some days.

In the instance of the one the most and the longest affected, the part inoculated inclined much more to indirect inflammation and to sphacelation than suppuration. The rest discovered their having taken the disease by pus forming in the incisions, on the second, third, or fourth day (the earliest appeared to be the best cases), so that you might collect several drops, and this you might continue to do for some days.

The mention of the appearances last enumerated leads me to think there must have been some mistake made by the printer of Mr. Flag's treatise, where it is said, that the smallpox by inoculation appears in two days, and that in the natural form in from fifteen to thirty. Except in the pus found in the incisions, in no instance did I discover the disease by inoculation, nor did the pox come out and form a crisis in less than eight, ten or eleven days, though some of the sheep would eat and ruminate, and, unless the teats were sore, nurse their lambs the whole time, while others appeared to be ill for two or three days. In the natural way, I never could find an instance of the disease being more than fifteen days before discovering itself by the symptoms; and though in general one would find the pox of the distinct kind, the patients would be ill for fifteen or twenty days longer, and would not appear quite well or thriving in less than thirty or forty.

It is singular that in no instance—whether the disease was taken the natural way or by inoculation—did I know of the ewes casting their young; not even in those cases where the form of the disorder was the confluent or the purple. In the few instances in which my sheep lost lambs, I attributed it to their being handled, when gravid with twins or triplings. I noticed that the disorder did not lessen the milk, at least if the sheep was not reduced by time. I also observed that there was less disposition\* for a fluid to form in the pustule than in the human subject. From frequently handling the lambs, I found that they perspired very freely on the belly near the groins, and were apt to have the testicles affected. I had no opportunity of examining an old male. All under my observation were ewes, in which I could discern no difference, whether the patient were nursing, gravid, or barren.

Thus, Sir, I have given you a succinct history of the disease; and, from the observations made, should recommend immediate inoculation—let the season or condition of the sheep be what it may—whenever the disorder gets into a flock.

With respect,  
*Hon. J. Bowdoin.*

Your humble servant,

*THOS. THAXTER.*

\* The word appears to be disposition, deposit, depression, as near as can be ascertained; disposat, it looks most like.