AN ADDRESS

IN RELATION TO

THE EPIZOÖTIC DISEASE

AMONG SWINE,

IMPROPERLY CALLED "HOG CHOLERA."

by Snow (E.M.)

READ BEFORE THE RHODE ISLAND MEDICAL SOCIETY,
JUNE 19, 1861.

ADDRESS

ON THE EPIZOÖTY, LATELY PREVALENT AMONG SWINE,

BY EDWIN M. SNOW, M. D., OF PROVIDENCE:

WITH THE RESULTS OF POST-MORTEM EXAMINATIONS,

BY G. L. COLLINS, M. D., OF PROVIDENCE.

READ BEFORE THE RHODE ISLAND MEDICAL SOCIETY, AT THE ANNUAL MEETING, JUNE 19, 1861.

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Among the subjects intimately connected with the science of medicine, and interesting to every intelligent physician, there is none of greater importance than the relations which exist between epizoötic and epidemic diseases. That such relations do exist seems to be evident, and numerous facts could be produced to prove it; but the character of these relations and the measures necessary to prevent their effects, are not fully known.

But my purpose, on the present occasion, is not so much to discuss this question as to call your attention to a single epizoötic disease which has prevailed with great severity in some portions of this country, and to some extent, in nearly all portions of it, within the last six or eight years. I do this, confidently expecting that if an interest is excited in this disease, you will not only be led to watch its progress and observe its symptoms, but that you will also endeavor to ascertain the relations which are supposed to exist between it and certain epidemic diseases.

The disease referred to, which, for want of a better name, has been improperly called "Hog Cholera," has prevailed in this vicinity, more particularly among large herds of swine, during

each of the last five winters; but has usually terminated with the end of cold weather. During the winter just past, it has been more severe than in any preceding, and has prevailed, more or less, in most of the towns in this vicinity. The present season, it has not, as heretofore, ceased with the cold weather; but has continued until the present time, and during the last five months has destroyed more than 300 hogs in the towns of North Providence, Cranston, and Johnston. During the last week in May, 20 grown hogs and from 30 to 40 pigs died with this disease, at the Field's Point farm, in Cranston, comprising nearly the whole herd at that place. I have also heard of its prevalence in various towns in Massachusetts, during the past winter. In the month of February my attention was called to the subject, and in company with several physicians of this city, visits were made to diseased hogs in Cranston and North Providence. Post-mortem examinations of hogs which had died with the disease, were made by Drs. G. L. Collins, J. W. C. Ely, and others, a minute account of which will be given hereafter. Particular enquiries were made of the owners and others, in relation to the symptoms and progress of the disease, and I have also obtained some facts by correspondence with parties at the West, where the disease first commenced.

The results arrived at, I propose to give briefly.

Symptoms.—The symptoms, as described by non-professional persons, are as various as can be imagined. No two persons agree, and no two cases of the disease are described alike. It is probable that if the disease could be carefully watched by persons accustomed to such observations, a more correct and uniform series of symptoms would be found. By condensing and arranging, as far as possible, the confused and blind accounts given by the owners of the animals, and by combining the results of our own observations, the sensible symptoms are found to be somewhat as follows:

1. *Refusal to eat.*—This is the first symptom usually noticed by those who have the care of the animals, though as will be seen hereafter, it is by no means the first symptom of the disease. The refusal of food continues through the whole sickness; and food of every description, solid and liquid, is refused.

2. *Great thirst.*—This is constant, and large quantities of cold water will be swallowed if it can be obtained. Even after the animal cannot stand alone, it will drink cold water with avidity.

3. After a time, the length of which varies very much, the animal begins to show signs of weakness ; reels, staggers, and, in attempting to walk, often falls down.

4. In most cases there is a diarrhœa, with copious fluid discharges of dark, bilious and very offensive matters. In a few cases, there is no diarrhœa ; but evacuations of hard, black balls, but in these cases the fluid, offensive matter is often found in the intestines after death.

5. In a few cases there is vomiting ; but this is not often severe, nor is it continued for any length of time.

6. The external appearance of the animal is at first paler than usual ; but towards the last of the sickness, purple spots appear, first on the nose and sides of the head. These extend along the sides and belly, and between the hind legs. When the purple appearance reaches this extent, the animal soon dies.

7. In many cases, perhaps a majority, ulcers are found on different parts of the body. These were particularly noticed on the inside of the lips and gums, and on the feet, and were often quite deep and excavated. In some cases, these ulcers were seen in the nostrils, and in one case there were extensive ulcerations on the tonsils.

8. In a few cases the legs are swelled, and the animal is lame ; sometimes the ears and other parts of the body are swelled and red ; sometimes the eyes are sore and inflamed ; sometimes carbuncular swellings are found, and generally the lymphatic glands seem to be enlarged.

9. In most cases the pulse is quickened, the respiration is hurried and difficult, and there is much cough. But in some genuine cases of the disease, there is no perceptible trouble with the lungs, and no important lesions are found in them after death.

10. The duration of the disease, in fatal cases, after the first symptoms are noticed, is extremely variable. Some we have seen which died within two or three hours ; others live many days. All judgment, however, in relation to this point, is ex-

tremely uncertain. The first symptom observed is usually the refusal of food; but it is probable, indeed it is certain, that the disease is progressing for a considerable period before this symptom is noticed. Cases like the following are sometimes seen: A hog refuses to eat, it soon grows weak, staggers in walking, turns purple on the sides and belly, and dies within two or three hours after the first symptom was noticed. But on examination after death, evidences of extensive disease are found at a stage of development which must have required many days to reach.

Such are, briefly, the sensible symptoms of the disease, as obtained from the descriptions of those who have the care of the animals, and from our own observations. I will now read the description of the symptoms, as published by Dr. George Sutton, of Aurora, Indiana, in February, 1857. Dr. Sutton says:

"The first symptoms that can generally be discovered, the hog appears weak, his head droops, and frequently, in a few hours after these symptoms, diarrhœa commences, which has caused the disease to receive the name of "Hog Cholera." Frequently there is vomiting;—sometimes from the bloody discharges, the disease resembles dysentery. In other cases, the lungs are principally affected, and there is difficult breathing and cough. Sometimes there is inflammation of the throat, and the tongue is also very much swollen and inflamed; sometimes there is bleeding from the nose, and the nose is swollen. In many, the disease appeared to be principally confined to the surface, and sometimes the ear and side of the head were swollen and inflamed;—sometimes one or both legs were inflamed and swollen, and the inflammation extended along the sides or belly, of a deep red color, almost precisely similar to phlegmonous erysipelas. Some had large sores on their legs, resembling carbuncles; others had gangrenous sores on their sides or flanks, from 3 to 6 inches in diameter; some appeared delirious, and others blind. These symptoms were combined in almost every possible variety; death took place in from one to five days. Out of a pen containing 100 hogs fed on slops, 33 generally died, and it required about eight weeks for the remainder to recover from the disease."

The symptoms, as described by Dr. Sutton, have a general similarity to those observed in this vicinity;—sufficient to show that they refer to the same disease.

POST-MORTEM APPEARANCES.

The following account of the post-mortem appearances has been prepared by Dr. George L. Collins, of this city, and is given in his own words.

"CASE I. The first hog examined was at Thomas Carron's pen in Cranston, February 9, 1861. Present, Drs. Snow, Ely, and Caswell. The subject was a sow, in poor condition: would weigh from eighty to ninety pounds. She had been sick for several days, and was but just able to walk with a feeble tottering step. The skin, on the ears and the tail, presented purple patches, and some spots were noticed upon the belly and legs. The animal was killed by bleeding.

There was scarcely any fat upon the viscera. The lungs were collapsed, but healthy, with the exception of the most depending portions, along the anterior border, where, to a slight extent, there was an appearance of congestion, with a deficiency of air in the part; giving a condition almost perfectly resembling atelectasis, as seen in a newly-born infant. The heart was healthy. The stomach was healthy. It was pretty well distended with an offensive compound of food. The small intestine contained some yellowish, thin matter, and about two dozen worms—*ascaris lumbricoides*—this portion of the intestines appeared healthy The large intestine, as had been previously the small, was opened throughout its whole extent, and carefully washed. In the cæcum were found two ulcerated patches, each three-quarters of an inch in diameter. The whole mucous surface of this portion of the intestine was softened, so that it could be easily scraped off with the handle of a knife. The muscular coat was, also, thought to be softened; allowing the intestine to be more readily torn than in the healthy state. The color, in some portions, was much darker than normal. The other organs appeared healthy, with the exception of the kidneys, which were of a yellowish-brown color; quite changed from the healthy character. The bladder was empty. In the omentum were two cysts, about an inch in diameter, each of which contained an *echinococcus*.

CASE II. At this visit we saw a boar, probably of two hundred pounds weight, which had been sick with the disease more

than a week, and was thought to be getting better. He presented no marked symptoms;—no cough nor quick breathing. At our next visit to this pen, February 13th, four days after the first, this animal was found dead, and was examined by Dr. Ely. The same medical gentlemen were present as before.

The mouth was normal. The surface of the skin was very much marked by purple discolorations, particularly upon the ears and the tail, and the depending portions of the body. The heart was healthy. The left lung was mostly healthy. The depending portion exhibited the appearance of congestion, as observed in the first case. The right lung was adherent to the costal pleura by recent adhesions. Nearly the whole of it was in the second stage of pneumonia; a portion of it was passing into the third stage. The stomach presented one patch of ulceration, on the mucous membrane, about half an inch in diameter;—otherwise it was healthy. The intestines were opened throughout the whole extent, and washed. The small intestine contained a little thin, yellowish matter—a few worms—and appeared healthy. The large intestine shewed no ulceration; but the mucous membrane was thought to be softer than in the healthy condition. The kidneys were of a yellowish color, as if fatty. The bladder contained four ounces of urine. The other organs were healthy.

I examined a portion of one kidney with the microscope, and found it quite fatty. Much of the epithelium from the tubuli was washed out.

The urine let fall, on cooling, a copious deposit of urate of ammonia. Its specific gravity was 1.022. It was slightly albuminous. The microscope revealed granular and epithelial casts, and much kidney epithelium.

Case III. February 26th, we visited John Gillon's pen, in North Providence, where we examined three animals: two that were already dead, and one that we killed. Present, Drs. Snow, Ely, C. W. Parsons, Brown, Carr and Caswell.

The first was a barrow, in good condition, and weighing about two hundred pounds. He had been sick two weeks. The mouth was a little frothy. No spots upon the surface. Not much post-mortem rigidity of body. The heart was healthy. The right

lung was in the third stage of pneumonia. It was attached to the costal pleura by pretty firm adhesions, and presented a tuberculous appearance throughout. In the depending half of the left lung there was hepatization, with the appearance of very fine miliary tubercles in some portions. This deposit appeared to commence in the air vesicles, and in the finest bronchial ramifactions, gradually increasing and thickening, until it presented the nodulated aspect, as seen in the right lung. A portion, examined with the microscope, presented the usual appearance of true tubercle. The intestines were not opened. They were filled with fecal matter, which, in the large intestine, was of the consistency observed in the healthy animal. A portion of the large intestine, which was observed to be dark and discolored, being cut off, presented an ulceration on the mucous surface, as large as a three-cent piece. The liver was yellow, and slightly fatty under the microscope. The kidneys were slightly more yellow than normal.

Case IV. The next subject was a sow, in poor condition. Her weight was, perhaps, one hundred pounds. Post-mortem rigidity well marked. The surface of the skin was much discolored by the purple patches. She had been sick more than two weeks. The heart was normal. The pericardium contained two ounces of yellowish liquid, which had coagulated around the heart. The depending half of each lung was in the second stage of pneumonia, and slightly adherent to the opposing pleura. The other portions were healthy. The large intestine, only, was opened. There were no ulcerations. It was thought to be a little more fragile than in health. The kidneys were too pale, and yellow. The other organs were in the normal state. A little mass was found on the intestine—or on the omentum where it united with the intestine—about the size of a pea, which resembled tubercle.

Case V. This was a sow, in poor condition. She had been sick but a few days. She was able to walk about, though very feeble. The respiration was hurried. The surface of the skin was much discolored. She was killed by bleeding.

The heart was healthy. The left lung was healthy, with the

exception of a small portion of the depending edge, which was passing into hepatization. The right lung was completely hepatized: a portion of it had already reached the third stage. The opposing pleuræ were adherent, where hepatization had taken place. The large intestine, only, was opened. It contained a dark, thinnish, tar-colored substance. There were no ulcerations. The mucous membrane was thought to be softened, as in other cases. The kidneys were very pale, almost straw-colored. A portion of one, examined by the microscope, was found slightly fatty. The bladder contained two ounces of urine;—of the specific gravity of 1.020—and highly albuminous. It presented, with the microscope, granular casts, and some fatty epithelial cells. The urine, on examination, was found greatly deficient in chlorides. The serous surfaces were, everywhere, studded with minute purpuric spots. The same kind of blood points were found throughout the substance of the kidneys.

Case VI. March 1, we again visited John Gillon's pen. On this occasion we examined three animals—two of them we found dead, and one we killed. Present, Drs. Mauran, Snow, Ely, N. Miller, Brown, Carr, Stickney and Caswell.

The first examined, on this occasion, was a sow, six months old, in poor condition:—her weight about one hundred pounds. She had died but a few hours before our visit. She had been sick two weeks. She had had some cough:—had not purged. There were a few purple spots about the head. The heart was normal, with the exception of a few purpuric spots upon its surface. The depending half of the left lung was hepatized;—a portion of it passing into the third stage. Five-sixths of the right lung was hepatized;—mostly in the third stage. The remaining sixth, (the upper portion,) was healthy. Both lungs were adherent to the costal pleura, over the portions hepatized. The liver was congested, giving it a dark color. The kidneys were congested. The cortical substance was less yellow than in any previous subject, though lighter than in health. Not more than a drachm of water was found in the bladder. The stomach and the small intestine appeared healthy. The stomach contained some food, and the small intestine, a little thin, yellowish

matter. The large intestine was opened and carefully examined. It was well filled with pretty hard, fecal matter. The tissue appeared softened and tender, as in former cases. Many of the solitary glands were enlarged, and ulcerated at the apexes. Ulcerations were found in this animal about the lips and gums. One foot was sore just under the dew-claws.

Case VII. This was a young sow, but two months old. She had been sick a month:—emaciated. Her weight was about twenty pounds. She had been dead but a few hours. The examination was made by Dr. Ely, to whom I am indebted for the following notes. There were no purpuric spots on the skin. The lips and gums were ulcerated. The heart was healthy. The lungs were not adherent in any place. They were slightly congested, and, along the depending edge, to a slight extent, presented indications of the first stage of pneumonia. The liver was healthy. The kidneys were pale and yellowish. There was a little water in the bladder. The stomach and small intestine were healthy. The large intestine was opened, and found ulcerated upon the mucous surface in its whole extent, with the exception of about four inches of the rectum, and one small spot near the cœcum. The tissue was thought to be softer and more fragile than in the healthy state.

Case VIII. This was a sow, about seven months old—in poor condition. Her weight was judged to be about seventy pounds. She had been sick two weeks:—had never purged. Her respirations were counted, and found to be sixty-four in a minute. She was killed by bleeding.

No purple spots were observed upon the skin. Ulcerations were found about the lips and gums. They were, as in other cases observed, oblong in shape, and resembled eschars formed by the actual cautary. The depth was about one-eighth of an inch. The left fore-foot was ulcerated between the hoofs. One quart of straw-colored fluid was found in the abdominal cavity, and one ounce in the pericardium. The serous membranes presented purpuric spots in abundance. The heart was healthy. One-fourth of the left lung was found in the second stage of pneumonia, and tuberculous. The tubercles were mostly small: but

a few were larger, and showed softening in the center. Most of the right lung was congested, and much of it hepatized. A portion of it was tuberculous. Fine miliary tubercles were observed where there was no pneumonia, and some hepatized portions contained no tubercles. Both lungs were adherent over the hepatized portions. In this case, as in every other examined, the anterior, or depending portions of the lungs were the parts suffering most from inflammation. The liver was healthy. The kidneys were quite yellowish. The stomach and the small intestine were healthy. The solitary glands in the large intestine were congested—some were enlarged, and ulcerated upon the apexes. This portion of intestine seemed softened and tender. The contents appeared in a healthy state. The bladder contained two ounces of urine, which was found to be slightly albuminous, and deficient in chlorides. There were no casts. Two cysts containing *echinococci* were found in the omentum.

Case IX. May 31st, I visited, with Dr. Snow, Mandly B. Hart's pen, at Field's Point, in Cranston, where I made an examination of a sow, ten months old. She was in good condition:—had been sick six days:—had not vomited nor purged. She miscarried, with eleven-weeks' pigs, two days before, which were all dead. She appeared sick and weak—refused food, but would take water. The breathing was quick and hurried, and the nostrils seemed obstructed. Purpuric spots were appearing upon the ears, and the belly. She was lame in the right fore-leg, which was swelled about the knee joint. She was killed by bleeding.

Ulcerations were found upon the lips, upon the tonsillary glands, and at the base of the epiglottis. A false membrane was found obstructing the nostrils, for three inches of the anterior portion; under which the mucous membrane appeared ulcerated. About the swollen joint of the leg, lymph was found effused, which was breaking down into pus. The heart was healthy. The right lung was nearly healthy. It was a little congested at the anterior border—no adhesions. The left lung was partially adherent to the costal pleura. There was a mass of gray hepatization, about as large as the closed fist, situated in the middle

lobe and reaching to the base of the lung. It had a well defined border, and passed abruptly into healthy tissue. The liver was healthy. There were several ounces of serum in the abdominal cavity. The stomach and intestines appeared healthy. A portion of the large intestine was examined upon the mucous surface, but presented no sign of ulceration or softening. The kidneys were of a pale yellowish color. The bladder contained eight or ten ounces of urine, which let fall some urates, on cooling, and gave slight indications of albumen. The uterus appeared healthy upon the serous surface, but internally it presented a dirty-looking, suppurating surface. No purpuric spots were found upon any of the serous surfaces. The lymphatic glands were generally enlarged, particularly those about the angle of the jaws.

We have here, then, the results of nine post-mortem examinations. Five of them were made upon animals dying of the disease, and four upon animals in the last stages of the disease, which were killed for examination. The latter were good representative cases, and for purposes of classification may be reckoned with the others.

In grouping, therefore, the pathological appearances observed, we find that purpuric spots upon the skin existed in six cases; in three of which they were very extensive. In two cases, purpuric spots were observed upon the serous membranes.

The feet and legs were not particularly examined, in the first five cases. In the remaining four, two were found ulcerated; one was lame about the knee joint; and one was well.

The mouth was not examined in three cases. In the remaining six, four presented ulcerations. In one there were ulcerations upon the tonsils, at the base of the epiglottis, and within the nares; where there was also a false membrane. This was, in fact, the only case where the throat and nares were dissected.

The heart was healthy, excepting effusion into the pericardium, which in only one case was considerable.

The lungs in two cases were almost healthy. In seven there existed hepatization; in five of which it was observed, to a greate or less extent, upon both sides. In one case, one lung was tu-

berculous—and in another both. In every case, where hepatization was found, there existed, also, pleural adhesions. Where only a part of a lung was hepatized, with one exception, it was the anterior or depending portion: the rule being reversed from that observed in the human subject.

The stomach was generally in a healthy condition. In one case there was ulceration of the mucous surface to a small extent.

The small intestine was in a healthy condition. Worms were found in two cases.

The large intestine was, most frequently, in a state of disease. In five cases it was ulcerated, to a greater or less extent: and in six it was thought to be somewhat inflamed and softened.

The liver was generally sound. In one case it was a good deal congested.

The kidneys were, in every case, pale and of a yellowish color: this condition was well marked. In two cases the microscope showed them to be fatty.

The bladder was generally healthy.

The urine was examined in four cases; in all of which it was more or less albuminous—in one case very much so. In two of these cases, granular and epithelial casts were observed;—in the other two, none. In two cases, in which the lungs were greatly hepatized, the urine was tested and found deficient in chlorides.

In two cases, serum existed in the abdominal cavity, and also in the thorax."

It would be superfluous, if I were able, to add anything to the preceding full description, by Dr. Collins, of the post-mortem appearances; but it may be interesting to add a brief account of these appearances as described by Dr. Sutton, of Indiana, four years since. He says:

"On opening the bodies, I found the appearances of the disease as various as the symptoms were different. I examined 47 hogs that had died of this disease, and scarcely found two that presented precisely the same appearance. In every instance there was evidence of a diffusive form of inflammation, which was not confined to any particular tissue. The skin was generally of a purple appearance, and in cutting through those parts which were

most inflamed, the cellular tissue was infiltrated with serum, and the skin was swollen. In nearly every case the mucous membrane of the stomach is more or less inflamed, presenting a bright red appearance, tumid, and frequently softened. Sometimes there was an effusion of blood into the stomach, and this organ was frequently found distended with food. In all cases where there had been diarrhœa or dysentery, the mucous membrane of the large or small bowels presented evidence of inflammation. Sometimes the bladder was inflamed, and occasionally contained an effusion of blood. The peritoneum, in 18 cases, presented marks of inflammation—there was effusion of bloody serum—and adhesions between the intestines, and between the intestines and sides of the body. In three cases, there was effusion of blood into the peritoneal cavity. Suffice it to say that I found the liver, the lungs, the pleura, the peritoneum, the mucous membrane of the bronchia, the trachea, and larnyx, all at different times bearing marks of inflammation;—frequently one or both lungs were engorged or hepatized, and adhering to the ribs. The lymphatic glands were generally inflamed, or greatly congested, resembling lumps of coagulated blood.

These are some of the facts revealed by our dissections, which show this disease to produce a diffusive form of inflammation which attacks the skin, the cellular, the serous, the mucous, and the glandular tissues. It spreads along these tissues very similar to the manner in which an erysipelas spreads along the tissues in the human system—and in some respects, resembles that disease."

Such are the facts relating to the symptoms and post-mortem appearances of this disease, as learned from my own observations and from the observations of others. Perhaps it might be the part of wisdom to confine myself to the facts, and to refrain from entering upon the field of theory and speculation. But this plan would hardly satisfy your expectations, and would certainly fail to satisfy my own inclinations. Besides, it seems to me that the facts are sufficient to justify something more than speculations, if not to establish a theory on sure foundations.

The first question which arises in the minds of those who are acquainted with the facts, as well as in the minds of those who know nothing about them, is this: What is the disease? In this case, as in all similar cases, those who have the least knowledge upon the subject, are the most positive in their opinions, and are ready to state at once the nature of the disease, and to give it a definite name.

This, after a careful study of the facts, I cannot do. I know of no name which would convey to medical men, and certainly not to others, a precise idea of the nature of the disease. Yet, it seems to me, that the facts as already given cannot fail to suggest to those familiar with diseases, some idea of the character of the disease under consideration.

As we read of enlarged glands, ulcerated intestines, carbuncular swellings, inflamed and hepatized lungs, purpuric spots, and other similar symptoms as found in animals in this disease; the mind of the physician at once reverts to pyæmia, phlegmonous erysipelas, typhus fever, and other like forms of asthenic disease in the human system. Here I am satisfied we have a clue to the true nature of this disease. It is a disease primarily of the blood, producing a depraved state of the system generally, a genuine typhus disease; call it *typhus fever*, if you choose, though this name is not at all satisfactory. The diarrhœa, which often occurs in typhoid fever, is not a "Cholera," neither is the diarrhœa of this disease in hogs, a "Hog Cholera," but it probably arises from the same cause as the diarrhœa in typhoid fever. The disease is in the system generally:—the diarrhœa is a local complication, or effect, of the general disease. Neither is this disease a pleuro-pneumonia, properly, though there is pleurisy and pneumonia existing in perhaps a majority of cases. It is a general disease of the system; the pleuro-pneumonia is only a local complication or effect of the general disase. It is well known that cases of pyæmia, as well as of low typhus and typhoid fever, in human subjects, are often complicated with pneumonia. So in this disease, the pleuro-pneumonia, the diarrhœa, the ulcerations in the large intestines, the purpuric spots, the ulcers about the mouth, feet and elsewhere, are only local effects of the general disease of the system.

It seems to me that physicians will obtain from this description a true idea of the nature of this disease, while any attempt to give it a definite name would only "darken counsel" upon the subject. Definite names have, however, been given to the same disease. Dr. Sutton, already quoted, says:

"We consider this disease has not its exact resemblance amongst the diseases to which the human system is subject, and

consequently we know of no appropriate name to call it. From the inflammation of the lymphatic glands, and the formation of sores like carbuncles, it, in some respects, resembles the plague, and I know of no better name to call it than the PLAGUE."

Some two thousand years since, Virgil described a "highly inflammatory fever among cattle, accompanied with tumors, carbuncles, ulcers, and purulent deposits throughout the whole body," to which the name of "*Murrain*" was given. Any one who reads his description, as well as those of numerous other writers in every century since, as given under the article "Murrain" in the "*New American Cyclopœdia*," cannot fail to see striking points of resemblance between that disease among cattle and the present disease among hogs. I am satisfied that the diseases are very similar, if not identical.

The symptoms and post-mortem appearances of the disease among cattle, which has caused so much excitement in New England during the past two years, under the name of pleuro-pneumonia, are almost precisely the same, so far as they relate to the lungs, as in the disease among swine which we have examined. Whether the pathological changes in other organs of the body are similar in the two diseases, I am unable to determine. I have never seen the disease in cattle, called pleuro-pneumonia, and in all the accounts of post-mortem examinations published by the Legislative Committee of Massachusetts, there is no report of the examination of any organ in the body but the lungs, except an occasional, incidental allusion to the heart and liver. Though diarrhœa, and "scouring of green fetid dung," were described as marked symptoms of that disease, there is no published evidence that the intestines were examined in any case.

Those who have seen the disease among swine, and who have read the evidence relating to pleuro-pneumonia, so called, must at least have very strong suspicions that the diseases are similar, and that the term pleuro-pneumonia is a misnomer.*

Shall we not conclude, then, that the "plague" of Dr. Sutton, the "hog-cholera" we have described, the "murrain" of Virgil and of all ages since, and the "pleuro-pneumonia" of Great

*See case of pleuro-pneumonia, reported at the end of this paper.

Britain and of New England, are similar diseases, having the same general features, presenting similar pathological changes, and are the result of similar causes?

It remains to add a few words in relation to the causes of the disease.

In this disease, as in all epidemic diseases of the human race, the universal tendency is to ascribe its propagation to *contagion*. Dr. Sutton says:

"Although this disease must occasionally have a spontaneous origin, yet, when once produced, it will spread rapidly by contagion."

The Commissioners of Massachusetts, in their investigations of the cattle disease, seem to have taken it for granted that it was a pleuro-pneumonia only, and that it was contagious.

Though want of time forbids the discussion of this question, I must think that there are not sufficient grounds for this opinion. It is comparatively but a few years since the belief was universal that yellow fever was contagious, and the most oppressive and inhuman restrictions, handed down from the dark ages, were enforced to prevent the disease, in every port of the civilized world. The same was true of cholera; and in this State, within the memory of most of those before me, persons have been forbidden to land, because they came from a neighboring city where cholera existed.

And yet the enlightened opinion of physicians of the present day has formally condemned, and will soon entirely put an end to, the quarantine of *persons* on account of yellow fever; while the idea that cholera is contagious, is, so far as I know, abandoned by all intelligent physicians at the present time.

So, I firmly believe it will soon be with reference to the disease among animals which we are considering. But this disease is an epizoöty, or perhaps we may more intelligibly say, (though the expression is incorrect,) that it is an epidemic disease among animals.

If an epidemic disease, then its primary cause is similar in its operation to that of other epidemics. What this primary cause of epidemics is, whether animal, vegetable or chemical, no one

at the present day, can satisfactorily explain. It probably exists in the atmosphere, progresses over a greater or less extent of country, in accordance with laws with which we are not acquainted, and alights upon the earth and produces its effects wherever, within the limits of its progress, it finds local circumstances adapted to its propagation. The following, then, as I understand the subject, are the causes of this disease among swine, and probably, also, of the disease among cattle, as well as of epidemics among men, viz.:

1. An epidemic atmospherical poison.

2. The local circumstances adapted to receive and propagate the poison existing in the atmosphere.

The co-existence of both these causes is essential to the development of the disease. When both these causes are present in any locality, and healthy animals are brought within the limits of their influence, a certain portion, sometimes all, will contract the disease. Both the causes above named may exist in a locality whether there are any animals there or not. *This is infection*, and this is the manner in which epidemic diseases are propagated. That *it is not contagion*, is proved by the fact that diseased animals, when removed from the infected locality to places where the two causes above named do not exist conjointly, *cannot possibly communicate the disease to other animals.* I know of instances in which this experiment has been tried, in this disease among swine.

Contagion originates only in living animal bodies, and communicates disease from the diseased animal itself, wherever it is present, in any and in all localities; and the animal itself, independent of atmospheric or other external circumstances, is the source from which the disease is propagated, either directly or indirectly.

Infection originates in inanimate bodies, and can increase and communicate disease *epidemically*, only in localities where the atmospheric poison is present.

But it was not my intention to enter upon the discussion of this highly interesting subject.

If then this disease be, as I fully believe, an epidemic, infectious disease, caused by an atmospheric poison acting in combi-

nation with local conditions adapted to a propagation of the poison, the indications for its prevention are plain. They are, to remove as far as possible the causes.

The cause existing in the atmosphere cannot be avoided except by removal beyond the limits of its existence; and this is not usually practicable. But the local conditions necessary to propagate the disease can, to a very great extent, be prevented.

These local conditions are, briefly, impure air arising from filthy pens and particularly from crowded pens, combined with unhealthy food and the want of pure water. It is not necessary to show the importance of preventing these, nor the manner in which it can be done.

With regard to the *treatment* of the disease, very little need be said. I do not believe that treatment of any kind is of any value whatever. If successful, it will cost much more than the animal is worth; but it will very rarely, if ever, be successful in removing the disease from the system, and success in lengthening the life of a diseased hog is hardly worth the trouble necessary to secure it.

If, however, the trial is desired, the indications for treatment are obvious. They are to support the system by stimulants and tonics, with pure air and pure cold water, and nourishing, healthy food. Chlorate of Potash in large doses has been recommended.

I am not ignorant of the fact that "certain cures" for this disease, as well as for cholera and other epidemics, are plenty in every neighborhood. These "certain cures" are usually kept secret, and have never yet been known to exert the slightest influence upon the progress or mortality of the diseases to which they are applied. While writing this paper, I hear of certain cures for this disease which the possessors refuse to disclose. Their most positive assertions fail to convince me that a disease which from its very nature must be, in most cases incurable, can be certainly cured in all cases; while their refusal to make known their remedies to the world proves that whatever may be the remedies, they certainly are entitled to little respect.

There are several other points connected with this subject, upon which I had intended to make some observations; but this

paper is already extended far beyond my expectations, and beyond the limits of your patience.

The subject, though not precisely of the character usually presented on these occasions, is of great practical importance to the community, and it is the duty of physicians to understand it, and to be able to give advice when needed.

The victims of this disease among swine are already numbered by hundreds of thousands, if not by millions, in the Western and Southern States, and we shall undoubtedly see more of it in New England. In February, 1857, Dr. Sutton, of Indiana, stated that 60,000 hogs had already died with this disease within 100 miles of Cincinnati.

The subject is also important and of the highest interest in view of the relations, to which I have already alluded, of this disease to the disease among cattle, and to certain epidemics which afflict the human family. The subject is also not without interest in its relations to the supply of food for cities. In my opinion, pork in its best estate is by no means desirable for food; and diseased pork is certainly less so. I have already had occasion to know that all persons are not governed by the Christian rule of doing as they would be done by, in this respect; and that some persons will send pork to the city markets which they would not eat themselves.

I have good reason to believe that on the appearance of the first symptoms of the disease, many hogs are killed, to save their value to their owners, and that the pork-eating inhabitants of our cities are, from time to time, solving the problem whether the flesh of diseased hogs is injurious to health.

I shall be glad to receive from any gentlemen, any accounts of this disease as it may be noticed by them, particularly in the country towns in this State.

CASE OF PLEURO-PNEUMONIA.—While these sheets are passing through the press, the following report with the post-mortem results, has been handed to me by Dr. Collins. Although I am not prepared to say that the disease is identical with the "Cattle Disease" observed in other places, yet it will be seen that the case was one of true *Pleuro-Pneumonia;* and that it was also accompanied by symptoms, and presented post-mortem appearances, which would seem to identify it with the disease which we have been considering. E. M. S.

"CASE. July 20, 1861, accompanied by Drs. Snow and Ely, I examined a diseased cow, near Elmwood, in Cranston.

This animal belonged to a small herd, of which three others had been sick with a similar disease; one of which had died, and two had recovered. The cow was about eight years old. She had a calf about the 1st of May last, and was in milk at the time she was taken sick, one month since. The first symptoms noticed were a sudden falling off in the quantity of milk and loss of appetite, though she continued to eat a little for two weeks after this. Cough supervened, with labored respiration.

We found her lying down, inclined to the right side. The pulse was small and weak, and 88 in a minute. The breathing was laborious, and of the character termed abdominal: the respirations were 20 in a minute. She was forced to get up, when she walked about twenty paces, with a slow, tottering gait, then immediately lay down again, upon the same side as before. She had been purging greatly for four days, which had much reduced her strength. The matter voided was a brownish, straw-colored, thin, gelatinous fluid. She was much emaciated. The milk had dried up soon after she was taken sick.

There was dullness on percussion, over the depending portions of both lungs; but this dullness was much greater and more extensive upon the right side. Here the respiration was bronchial, with coarse, mucous rales: low down it was very indistinct. She was killed by bleeding.

Post-Mortem Examination.—There was nothing peculiar about the mouth or feet, or the external surface of the body. The heart was soft and flabby. The pericardium contained a few ounces of serum, and a yellowish, fibrinous clot as large as half the fist. The left lung was adherent to the costal pleura, to a small extent, towards the depending edge, where a portion of the lung was more dense than usual, and less pervious to air. The right pleura had been the seat of very general and intense inflammation. A small portion, as large as two hands, at the upper and posterior part, had escaped inflammation, and was surrounded by firm adhesions, isolating it from the rest of the pleural sac, which was filled by a yellowish serum to the amount of from twelve to sixteen quarts; filling the cavity, compressing the lung, and crowding the mediastinum towards the left side. Immense quantities of curdy, flaky fibrin were hanging in shaggy layers, and masses, from the walls of the cavity. A small portion of the lung, at the upper and posterior part, where there had been no pleural inflammation, was in a healthy state, though somewhat compressed. About half of the remainder, the anterior portion, was in a carnified condition; the result of combined inflammation and compression. The remainder, the depending and posterior portion, was in the state of advanced pneumonia known as gray hepatization; almost breaking down and falling to pieces while removing it.

The first three stomachs were apparently healthy. The first contained, perhaps, half the usual amount of food. The fourth stomach was empty, and presented many—perhaps twenty—small ulcerations upon the mucous surface; they were more numerous towards the pyloric extremity. Just at the pyloric stricture, there was one large deep ulcer, about three-fourths of an inch in diameter, by half an inch in depth. The intestines contained no chyle or fecal matter, but a considerable amount of fluid resembling that purged. The intestines were opened throughout nearly their whole length; but the only structural changes observed were softening of the mucous membranes of the large intestine and of the ileum, and a general fragile condition of the whole thickness of the large intestine, so much so