

# MAINE STATE LEGISLATURE

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# Sixty - Third Legislature.

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SENATE.

No. 26.

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## STATE OF MAINE.

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*To the President of the Senate and Speaker of the House of Representatives.*

The extensive and disastrous outbreak of tuberculosis at the State College Farm was for the first time brought to my attention during the first week in March, 1886, at which time I received a telegram from Z. A. Gilbert, chairman of the "Board of Cattle Commissioners," to go at once to Orono and inspect the College herd, which at that time numbered over fifty head of thoroughbred Jersey and Short-horn cattle. Arriving at the farm, I for the first time met with President Fernald, Professors Balentine and Jordan, and Mr. G. M. Gowell, the efficient Superintendent, who afforded me every facility to examine the animals, and from whom I received such information and history of their cases as enabled me promptly to come to the conclusion that a large proportion of the animals were affected with tuberculosis, perhaps better known to the public at large as phthisis pulmonalis or consumption. The result of subsequent examinations and consultations with the State and College officials, and finally with Dr. C. B. Michener, who was detailed for this service by the Commissioner of Agriculture at Washington, culminated, as is now well known, in the condemnation and destruction of the whole

herd. As this is the first case on record in which an entire herd of anything like this number and value have ever been destroyed as the result of official investigation, and as some most remarkable and interesting features of the disease have developed in tracing its origin and progress, I feel obliged to go at some length into such dry details of individual cases as have a direct bearing upon some animals connected with the College herd, which are now in my opinion a constant menace to the future cattle interests of Maine. The outbreak at Orono has probably invited more gratuitous criticism and attention from stockowners and the general public, than would have attached to any other public or private enterprise, owing in great part to the prominent position to which the State College has attained as a teacher and promoter of scientific advancement and progressive farming in this State; and I believe the Trustees and Faculty of the institution, as well as the Cattle Commissioners, should challenge and invite the fullest inquiry and investigation into both causes and results, to which the public are justly entitled.

At the time of my first visit I found the buildings in which the cattle were contained were among the best and most commodious I had ever visited, and that every provision for the maintenance of perfect health among its occupants had been fully and amply secured. An abundance of sunlight and pure water, scrupulous cleanliness, sufficient and wholesome nutrition, thorough drainage, and ventilation so perfect that the air was almost as pure inside the barn as out; all contributed to the uniformly fine appearance of this high-bred herd, which proved so deceptive (upon further investigation) that, had it not been for the persistent and pathognomonic cough by which they one by one betrayed their real condition, I should have much doubted the correctness of my decision. The rough coat and arched spine, the difficult and labored respiration, the sunken eye and pendulous abdomen, with extreme debility and emaciation were nearly all absent in this herd, the judicious attention to hygiene, and the untiring care-taking of their faithful Superintendent, accounting in a great

measure for the slow but sure development of the disease, a circumstance that so long deceived the attendants and College officials themselves as to their true condition. Many of the animals were also pregnant, and it is a well-known fact that increase of the tubercular growth is then held in abeyance, the energies of the nutritive processes of the body being diverted to the nourishment and growth of the fœtus, while after parturition the system is for a time debilitated, and rapid extension of tubercle is favored. Individual members of the herd were of great excellence, several cows having "butter records" of  $16\frac{1}{2}$  pounds per week, while 150 pounds of "gilt-edged" butter was being sold in Bangor market weekly. About ten days before my visit the Jersey cow, Pet, No. 40, P. M., fourteen years old, had become so emaciated that she had been killed, and lay frozen in the field adjoining the stables, and this cadaver furnished me with ample opportunity to verify my diagnosis. From this cow I obtained the lungs, and a cross-section of the pulmonary tissue revealed the presence of numerous yellow tubercles, large and small cavities filled with a muco-purulent mass, others with caseous material. The lungs presented the identical lesions afterwards found in most of the animals at Orono, and of the peculiar metamorphosis which tubercles undergo, those of *caseous degeneration* afford the most favorable conditions for infecting the expired air of diseased animals. At the time of my second visit, March 12th, from among ten or twelve cows I had previously ordered isolated from the others, I selected two Jersey cows, Princess Alice, No. 44, P. M., and Princess Alba, No. 27, P. M. (the latter I then regarded as a typical case), and had them destroyed for post mortem examination. Princess Alba had a temperature of  $103\ 3-5^{\circ}$ , marked emaciation, and dulness on percussion over the right lung, while auscultation clearly disclosed humid crackling or gurgling rales. The autopsy revealed an extraordinary amount of disease. The lung pericardial and plural membranes were loaded with deposit, which hung like bunches of grapes, exhibiting a perfect case of what is known as "angleberries." In some

parts there was scarcely a remnant of proper lung-structure detectable, while others contained large tubercles filled with caseous material and also cavities connecting with bronchia, whose contents had been expectorated or absorbed. The bronchial glands in this case had attained enormous dimensions, the thymous weighing several pounds, and altogether the lesions were as extensive and varied as in any subsequent autopsy. I shall have occasion to speak particularly of this cow again as the dam of the "Kent Bull" of Bucksport. The lungs of Princess Alice were studded with miliary tubercles scattered throughout them, while the bronchial lymphatic glands contained calcified material that grated under the knife when attempting to cut it. Mr. Gowell wrote me on March 20th: "There is not a very marked change in many of the cattle, but in others, particularly those isolated in the stable, the process of 'wearing out' is going on actively, and every day's developments go to sustain my conviction and opinion expressed before notifying the 'Board of Commissioners' *that the entire herd was doomed*. Unpleasant as it was, *I was forced to recognize the truth.*"

On April 6th, the Commissioners met with the Governor and Council, at Orono, when the herd was again inspected and final action recommended at an early date. I then suggested to Governor Robie, the propriety of requesting the Hon. Norman J. Colman, Commissioner of Agriculture, at Washington, to send Professor Salmon, or some other expert examiner from his office, to consult and advise with the Cattle Commissioners, as to the proper disposal of so valuable a herd. The request was promptly complied with and Dr. Ch. B. Michener, Professor of Cattle Pathology and Obstetrics, at the American Veterinary College of New York, was detailed for this service.

How well that service was performed, was the subject of a personal letter from Gov. Robie to Commissioner Colman, in which was conveyed the high appreciation of the State and College officials of the great value of Dr. Michener's timely and professional assistance. Personally, I am resting under

renewed and lasting obligations, for sound counsel and advice, relieving me in a great measure from the responsibilities devolving upon me as Veterinary Officer of the "Board of Commissioners on Contagious Diseases." Dr. Michener arrived April 21st, and on the 22d and 23d, after a careful and critical examination of every animal in the herd, it was found necessary to condemn them all, when they were forthwith expeditiously and humanely killed, and the post mortems, openly made in the presence of the Governor, prominent physicians, stock-owners, reporters and others interested, the autopsies in every instance revealing the fact that the disease had been correctly interpreted, and that every animal presented unmistakable lesions of Tuberculosis.

Much unfriendly comment has already been indulged in in regard to these cases by parties who entertained crude and erroneous ideas upon the subject, and it has been stated that too "much science," book farming, concentrated food, "cotton-seed meal," &c., were each or all the cause of their destruction, but having been put in possession of the formula and amount of feed furnished, I am able to state that there is no foundation in fact for any such allegations, and that the true cause lies "far and beyond" all such considerations. In no instance were over three pounds per day of cotton-seed meal furnished to cows giving a full flow of milk, and heifers carrying their first calf (Primiperas) have never received a particle, while the post mortem appearance of the latter animals *presented fully as severe lesions of tubercles as the former*, and calves which had never received any other nourishment than their mother's milk, were found to be thoroughly diseased. No writer of the period has given to posterity so classical a description of these devastations among animals as Virgil in his "Georgics."

" Not whirlwinds from the sea so frequent rush,  
Big with storm, as pests mid cattle rage,  
Nor individuals sole disorders seize,  
But, suddenly, whole flocks, with every hope,  
At once, and, from the youngest, all the race."

In my earnest endeavors to trace the origin of the disease among the College herd, I was surprised to find that as long ago as 1876, Mr. J. R. Farrington, who was then Superintendent of the State Farm, sold to Mr. Henry Boardman, of Bangor, two cows that proved a few years later to result in chronic cases of Tuberculosis. Mr. Boardman, who for many years has carried on an extensive milk-farm near Bangor, has very kindly furnished me with the details of the purchase and disposal of these cows, so that I am enabled to establish the fact that these were the primary cases developed upon the College farm. Mr. Gowell writes me, under date of January 11th, "I presume you have now sufficient proof to show that the disease was on the farm when Mr. Farrington was here. I have looked in every direction for light previous to 1876, but have been forced to give it up." So it would seem to be settled that the disease has been smouldering in this herd for at least ten years, only to lift its hydra-head the past season, and cause the total destruction of the entire herd. On October 3rd, 1876, Mr. Farrington sold to Mr. Boardman, one red grade Jersey cow, five years old, named Susan, for \$40.00, and on November 25th, 1876, sold him a red and white grade Durham cow, called Dora, for \$50.00. Mr. Boardman tells me *'this latter cow always had a cough, from the time he received her'* until he sold her to a butcher, March 8th, 1879, and when killed was found to be full of tubercles, on the liver and lungs, and on the ribs and plates well up to the throat." Upon Mr. Boardman's attention being called to the matter he refunded the butcher \$38.00 of the amount paid him, and the carcass of the cow was sold to "boil out" at "one and a half" cents per pound. Mr. Boardman kept Susan five years, (during which time she failed to breed) when she wasted away and died of consumption, and he had her buried "hide and all," and these are the only cases that ever proved diseased upon his premises, in an experience in dairying extending over many years, in which he has always kept from ten to forty cows. Right here, a very significant fact presents itself, proving conclusively to my mind, that the

cows sold to Mr. Boardman, were *predisposed to the disease* when they left the College farm, by a letter received from Mr. Gowell, under date of March 20th, 1886, in which he says, "I have learned of several animals aside from Mr. Boardman's, *that were sold from the herd six or seven years ago and slaughtered that were found to be far gone with diseased lungs.* These statements have been brought to me by purchasing parties. Last fall I sold a young bull to a neighbor, to-day he tells me the bull has a "stiff neck" and small bunch behind ear. *These are the symptoms of disease shown by our heifers that I told you of.* I told him I would notify you when you came again. Will you not arrange to remain here an additional day and attend to the case? I am anxious about it." Two items of this important statement attract my attention, and these I have underlined. The first:—that several animals aside from Mr. Boardman's sold six or seven years ago "were found far gone with the disease," would carry them back to 1879 and '80, just about the same time Boardman's cow Dora was found to be thoroughly diseased, and *unquestionably from the same source.* The second:—that the young bull sold to his neighbor had a "stiff neck." Mr. Gowell had previously told me of this symptom among some young heifers, which at the time he attributed to feeding out of high troughs, and I had explained to him, that it is only in exceptional cases that in the course of this malady, alterations are not found in the lymphatic glands of the head, neck or chest, especially in the submaxillary, parotid and thoracic, (which would give young animals the appearance of stiff neck) as well as in the lymphatic glands.

Mr. Farrington remained Superintendent of the State Farm until 1878, when after serving another year as "Instructor of Agriculture," he received the responsible appointment of Superintendent of the State Reform School, which position he now holds. At the close of 1877, Mr. Farrington turned over to his successor, Mr. Timothy G. Rich, thirty-four animals, comprising seven Short-Horns, eight Ayrshires, nine Jerseys, ten Grades, and his last annual report to the Trustees

of the Maine State College becomes so important, in the light of subsequent events, that I give place to his full statement of the names and value of stock then upon the College farm.

Short-Horn cow	Cornelia, 11 years old .....	\$150 00
“	heifer Cornucopia, 3 years old.....	125 00
“	“ Duchess of Maine, 3 years ....	150 00
“	calf Cornucopia, 2nd, 3 months old...	25 00
“	bull Napoleon, 3rd, 2 years old .....	150 00
“	“ Dirigo, 19 months old .....	50 00
“	“ calf Duke of Maine, 3 months old,	25 00
Ayrshire bull	Hiempsal, 4 years old.....	125 00
“	cow Olee, 6 years old .....	200 00
“	“ Isabel, 7 years old .....	150 00
“	“ Olivia, 3 years old.....	140 00
“	“ Oleeannee, 2 years old .....	85 00
“	“ Oletta, 15 months old.....	70 00
“	heifer calf Olivia, 2nd, 5 months .....	35 00
“	“ Isabel, 2nd, 3 months old....	35 00
Jersey bull	Harry, 2 years old.....	75 00
“	“ calf Harry, 2nd, 6 months old .....	30 00
“	“ “ Prince Peter, 2nd, 6 months old,	25 00
“	cow Hebe, 11 years old .....	250 00
“	“ Pride of Lachine, 8 years old .....	200 00
“	heifer Hepsy, 3 years old .....	200 00
“	“ Pride of the Island, 17 months old,	65 00
“	“ Hester Hart, 17 months old.....	75 00
“	calf Helen, 10 months old.....	50 00
Grade Short-Horn heifer	Maggie, 3rd, 3 years old..	65 00
“	Ayrshire heifer Jennie, 19 months old ....	35 00
“	“ “ Gipsy, 2nd, 19 months old,	40 00
“	Jersey cow Maggie, 8 years old .....	70 00
“	“ “ Topsey, 7 years old .....	100 00
“	“ “ Gipsy, 5 years old .....	70 00
“	“ “ May, 3 years old .....	65 00
“	“ heifer Topsey, 2nd, 17 months old..	45 00
“	“ “ Topsey, 3rd, 10 months old..	25 00
One two years' old steer.....		20 00

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Number of animals, 34. Value..... \$3,020 00

Mr. T. G. Rich made his first annual report as Farm Superintendent in 1878, when the number of the herd was stated to be twenty-five, and the value, \$1165.00. Mr. Rich's second annual report was in 1879, at which time the herd numbered twenty-seven head, seven of these being calves, one year old or less, *and no value is given*. Mr. Rich's third annual report was in 1880, at which time the herd numbered thirty-six, seventeen of which were calves, one year old or less, *and no value given*. Mr. Rich's last annual report was in 1881, at which time the herd numbered twenty-eight head, fourteen of them being calves one year old or less, *and no value given*. Mr. Rich's own reports, given almost "verbatim," as I now present them, would leave him as making a most unfavorable showing of his management of farm affairs, were it not as I now understand it, that the Trustees, yielding to the "popular demand" that the hay crop be increased, and the farm be put upon a paying basis if possible, gave such instructions to Mr. Rich. In pursuance of such demands, Mr. Rich disposed of quite a number of thoroughbred animals, selected by his predecessor, selling them at a great deduction from cost as well as their actual value at the time, and replaced them with cheaper cattle. But the fact still remains that Mr. Rich must have known that he had a "contagious disease" of some kind to contend with, and if he had killed or sold the entire lot, it would have proved a "blessing to the State." He did sell several animals from the herd, (according to Mr. Gowell) that upon *"being slaughtered were found to be far gone with the disease."* He himself killed an Ayrshire in 1880, that he tells me *"coughed and pined away,"* and another at pasture in 1881, that died from an "unknown trouble." He turned over to Mr. Gowell, in 1882, the grade Short-Horn cow Maggie 3rd, afterward killed, who was *coughing when he let her go*; he also turned over Rose 8th, the thoroughbred Short-Horn cow that *failed to breed*, and upon being *slaughtered was found to be badly affected*, and last but not least, he turned over Hepsy and "Helen Hart," (No. 5, Post Mortem report) the latter cow the mother of *two* bulls sold from

the farm, now coming two and three years old, and also Helen's calf (No. 6, P. M). "Helen Hart" was out of "Hepsy Hart" and she out of *Hebe*, a Jersey cow, that *refused to breed* and fell away in flesh in Mr. Rich's hands, and he sold her to a butcher in 1879, for *twenty-two dollars*, which was less than ten per cent of what Mr. Farrington paid for her, he having bought her of Dr. Boutelle in 1874, for *two hundred and fifty dollars*. I am in possession of all the College reports of Farm Superintendent from 1866, for *twenty years* down to Mr. Gowell's last report in 1886, and in but a single instance do I find any mention of the loss of one animal, either by *accident or disease*, excepting that Mr. Farrington, in 1875, reports the loss of the Short-Horn bull Napoleon (sire of Maggie, dam of Maggie 3rd), 5 years old, "who died from an unknown disease that appeared to be an affection of the salivary glands," and in 1877, he lost the Short-Horn cow "Duchess of Lakeside" from Gastritis (inflammation of the stomach).

President Wm. P. Wingate, in his report to the Senate and House of Representatives, in 1881, announced Mr. Rich's resignation, and the appointment of Mr. G. M. Gowell, then President of the State Board of Agriculture, and said, "Mr. Gowell is fully in sympathy with the purposes of the College, and has a clear apprehension of its importance as a part of the educational system of the State. He is a progressive and successful farmer, and in matters pertaining to agriculture in Maine, is abreast with the best thought and practice of the times. It is believed that he possesses special qualifications for the position." Mr. Gowell's first annual report was in 1882, when the stock was composed of twenty-five cattle, "one pair of oxen, seventeen cows, two bulls, two yearling steers, and two heifer calves. Included in the above are the following thoroughbreds: one Short-Horn bull, one year old; one Jersey bull, one year old; three Jersey cows and two Short-Horn cows. The larger part of the herd is a pure cross between the Jersey and Ayrshire breeds," the Jersey predominating. In 1883, he says, "Earnest efforts have been made

to improve the stock, and there are now forty cattle, twenty-four of them being thoroughbred. The Short-Horn herd contains five animals. The A. J. C. C. herd consists of eight, and of 'Maine Jerseys' there are twelve. Among the members of these herds I am free to say there is not an inferior animal. In the breeding of Short-Horns, the aim has been to unite, so far as possible, the qualities of growth, thrift, and flesh, with the ability to produce milk. In breeding both classes of Jerseys, constitutional vigor and rich milking powers have been sought for. The remainder of the herd are of a cross between the Jersey and Ayrshire breeds." In 1884, Mr. Gowell's third annual report says, "The herd of cattle consists of forty-two animals, thirty-seven of which are thoroughbred. Of these, five are Short-Horns, nineteen are 'Maine Jerseys,' and thirteen are 'Cattle Club' Jerseys. Among the Jerseys are some large producers, of good breeding, partaking largely of the blood of the great butter families of the world. Most of the cows are young, many not having matured yet. The young animals have mostly been bred upon the farm, and are vigorous, well-developed specimens of their respective breeds. Sales of young bulls to farmers, for breeding, have been frequent, but the heifers have mostly been retained, as the farm is yet under-stocked." In 1885, Mr. Gowell reports, "There are upon the farm forty-six cattle, forty of them being thoroughbred. Of these, eight are Short-Horns, sixteen are 'Maine State' Jerseys, and sixteen are 'Cattle Club' Jerseys. Approved bulls are at the head of these herds, and the young animals produced are of much excellence. Twenty-six cows and heifers are now in milk."

Mr. Gowell's last report, of 1886, has just been published, and his summary says: "The herd numbered fifty-one animals before its destruction. Forty-eight of them were registered thoroughbreds, and the remaining three were cross-bred Jersey-Ayrshires. Of the forty-eight thoroughbreds, ten were Short-Horns, seventeen were 'Maine State Jerseys,' and twenty-one were 'American Cattle Club Jerseys.' These animals, or the stock from which they were bred, had

mostly been selected in different localities, where desirable specimens could be found, and placed here within the last five years. The aim had been to secure the best animals obtainable, and as the result of this selection and breeding the herd had attained a very high degree of excellence." No values are placed upon the herds in any of the years since Mr. Gowell has been Superintendent. The following report of Dr. Michener will be read with interest in this connection :

269 W. 38TH STREET, NEW YORK, April 29, 1886.

*To His Excellency, Frederick Robie, Esq., Governor of Maine :*

DEAR SIR:—Pursuant to an order from Hon. Norman J. Colman, United States Commissioner of Agriculture, I started on the 19th instant for Orono, Maine, to advise with your State Veterinarian, Dr. George H. Bailey, as to what disposition should be made of the cattle belonging to the State College farm. Arriving there before the State authorities, I had ample time to study carefully the history and surroundings of the herd.

From G. M. Gowell, Superintendent of the farm, I learned that for the past eight or ten years there occurred an occasional death among the cattle, and as nearly as I could judge from his description, these animals were affected with the same disease that prevailed at this examination.

The trouble was evidently a pulmonary one, a more or less persistent cough, irregular or hurried breathing and emaciation being witnessed in all.

I was first led to examine the hygienic surroundings. The barn is a large one and has ample room for the stock. It is well lighted and thoroughly ventilated, the air being surprisingly pure as I entered the building early in the morning. The stalls are kept very clean, as the animals themselves show. The manure is thrown in the basement, but a free current of air prevents any appreciable odor from arising to the stable. The feeding is judicious in every sense, and the food, both grain and hay, is of the best quality.

From the history of the previous cases, and upon examining a few of the cattle that presented the most marked symptoms, I was able to diagnose the disease as tuberculosis, beyond any reasonable doubt.

Upon the arrival of the State authorities it was decided to destroy some of the worst cases for post mortem purposes. The animals thus selected were some that State Veterinarian Bailey had previously examined and placed by themselves in the horse barn. I will refer to some of them by name and give the lesions presented. Cow Pansy presented numerous miliary tubercles throughout the left lung, and in the right were masses of tubercular deposits of various sizes, situated chiefly near the apex of the lung. These masses had become cheesy or calcareous.

Hyacinth presented smaller aggregations of grayish white nodules throughout the substance of both lungs.

Flossy—both lungs affected; in the right lung near its center was noticed a large abscess, due to softening and breaking down of tubercular deposits. The left humero-radial, or elbow joint, was considerably enlarged and had given rise to lameness during the past few months. The knee joint of the same leg was first involved, but now appeared healthy. The synovial membrane and extremities of the humerus and radius were in a diseased condition, but presented no calcareous deposits or appearances of rheumatoid arthritis. The prepectoral and brachial lymphatic glands were found to contain much cheesy and calcareous matter.

Cows Edith, Crummie, Mildred, Blanch, and others showed extensive granulations on the costal and pulmonary pleuræ, which in some instances firmly united the lungs to the ribs.

Helen Hart, in addition to similar lesions of the thoracic organs, revealed well-developed tubercles in the udder. Some of these had broken down and their contents was discharged into the milk sinuses, and tainted the milk—a fact that had been observed by those in charge for some days.

It does not appear necessary for me to detail the lesions found in individual cases beyond this, except to remark that other organs of the body were frequently involved—liver, intestines, etc. The calves presented mostly diseased conditions of lymphatic glands and intestines; diarrhœa and other digestive disorders being here most marked.

Out of the forty-seven (47) head destroyed, all (four or five calves were not examined, but were killed because of being the offspring of diseased dams, and having occupied the infected barn,) presented symptoms which, as you are probably aware, were accurately interpreted in every instance, even where but very small and deep-seated portions of lung tissue were involved.

The uniformity of these symptoms and pathological lesions must prove to all thinking minds (whether little or nothing is known of the appearance of the disease in question) that there existed in each individual member of the herd one and the same disease.

That this disease is both hereditary and contagious seems also patent from the fact that calves scarcely one month old were plainly affected, and that those animals recently bought and placed with the diseased cattle show upon post-mortem examination the initial lesions of this malady.

In answer to those who contend that this disease was caused by improper feeding, or lack of sufficient ventilation and exercise, it is only necessary to remind you that tuberculosis, like small pox and similar diseases, is a specific malady, one that can only be spread by coming in contact in some way with its special and determined infecting agent.

The assertions that cotton-seed meal had anything to do with the origin or spread of this disease are simply ridiculous.

Taking into consideration, then, the facts that a very large proportion of the herd (all, we might almost say) were affected with a disease communicable not only from animal to animal, but from animal to man; that in the future, death after death would occur yearly; that scarcely by any possibility could calves be raised from any of these cows that would

reach maturity free from this pestilence; that animals purchased elsewhere and placed with this herd would (as past experience proves) soon become diseased; and that the barn itself is now infected, and must be left vacant for a considerable period; parts of it (floors, etc.) removed and burned, and a thorough and repeated disinfection be resorted to,—it becomes apparent to all, I think, that the only safe and proper course to pursue was the one advised, i. e., the slaughter of the entire herd.

Some of the meat might have been used as food had it not been for the prejudice that was so generally felt against it. For some time it has been impossible to sell even the butter from these cows, and I was assured by every one likely to know, that under no circumstances could a pound of the meat be disposed of now, or even months later.

The swine on the farm, that had been fed largely on the milk of these cows, were examined, and one pig nearly a year old was killed and carefully examined, but no traces of the tuberculosis could be detected. The butcher who kills the pigs raised on the farm states that in some instances the liver has appeared diseased. In conclusion, I can only recommend that when other animals are purchased, care be taken to buy from the herds where this disease has never existed, and that each animal be examined, at the time of purchase, by your State Veterinarian.

Very respectfully,

CH. B. MICHENER, V. S.,  
*Inspector Bureau of Animal Industry.*

I fully concur with the above report.

GEO. H. BAILEY, D. V. S.,  
*Commissioner for Maine on Contagious Diseases of Animals.*

The buildings have been disinfected through the agency of carbolic acid, sulphuric acid, copperas solution and fumes of burning sulphur. Those parts of the floors upon which animals stood were removed and replaced by new material.

The quarantine was raised by the following communication November 18, 1886:

PORTLAND, Nov. 18, 1886.

*To the Trustees of the Maine State College of Agriculture and Mechanic Arts:*

This is to certify that on November 10th I visited Orono to inspect the buildings that had contained the Jersey herd destroyed by order of the Cattle Commissioners, and find that all the recommendations and requirements prescribed by Dr. Michener and myself have been faithfully complied with, and believe the buildings to be in a safe condition to introduce new stock, as it is possible to make them through the agency of disinfectants and thorough ventilation. The means adopted meet my entire approval.

GEO. H. BAILEY, D. V. S.,  
*State Veterinary Surgeon.*

Mr. Gowell writes to me, under date of December 13th, 1886, in reply to my inquiry, "Mr. Rich turned over to me quite a lot of young steers that I sold within the next few months, excepting one pair that I kept a year or over. He also left some seven or eight cows. The most of them were kept by me during the next year. Four of them were kept until 1884, two were kept until 1885, and one, Helen Hart, (No. 5, P. M.) until last spring. As I have previously told you, *the old Short-Horn cow was coughing in 1882, when I came here.* By good feeding she seemingly recovered, at least the cough ceased, and she did choice work for a year or more, when she again failed and was destroyed. No examination was made of her after slaughtering. Another of these cows was Rose 8th, of the Short-Horn Herd Book—a young cow—*she refused to breed* and becoming fat was sold for beef, *and upon being butchered was found badly affected*, as I have before told you." So, to state it plainly, Mr. Gowell received from Mr. Rich in 1882 a "legacy of corruption" that has already cost the State thousands of dollars, when, if at that time he had promptly destroyed this meagre and worthless "band of non-descripts," and thoroughly disinfected his premises, the splendid herd he afterwards so prudently selected and so carefully reared upon the College farm would undoubtedly have been alive and well to-day—alike creditable and profitable to the State—instead of having found a nameless sepulchre upon the banks of the Penobscot. It is but simple justice to Mr. Gowell to say that he purchased only the most approved animals "whenever and wherever" they could be bought to the best advantage, and the "personnel" of the herd at Orono was the best endorsement he could have asked, that they were critically and intelligently selected, but when he had collected them together and domiciled them with the contaminated mongrels he had of Rich, he led them into the presence of a "pestilence that walketh in darkness, and a destruction that wasteth at noonday." In no instance have I been able to learn of a *single herd or a single town* in Maine, from which these animals were purchased, that down to the present time have

ever been affected with Tuberculosis, and I am led irresistably to the conclusion that the disease that finally consumed the entire herd at Orono was generated, developed and confined within the boundaries of the College farm, and if no animals had ever been sold from the herd, we could now report the malady as *completely and effectively stamped out*.

The old cow Hebe, the "Jonah" of the College lot, was purchased from Dr. Boutelle, and I believe the purity and freedom from disease of his herd has never been called in question. Two cows, Juno 2nd and Juliette, came from Briggs & Son, Maple Grove Stock Farm, and their herd are clean and healthy, to my own personal knowledge. Mr. B. F. Briggs writes me from Auburn, "Pet, the dam of Juliette, was sold to a neighbor of ours. She was, to the day of her death, a perfectly healthy and strong cow, and all of her descendants have been, and so have the descendants of Juno 2nd." Several came from Winthrop, and I have never heard of a "Maine State Jersey" having Tuberculosis in the town they came from, and it is so with all the others; the "fountain head" was pure until mixed up with the polluted herd at Orono. There is plenty of "food for reflection" in such startling evidences of contagion as these cases afford, which should be well considered by prudent men, in the purchase of animals to increase their herds, or to lay the foundation of new ventures in that direction. The evidence all goes to show that the animals purchased by Mr. Gowell were not only *sound* when he bought them, but were from *sound parentage*, and that they were themselves affected by contact with the old members of the College herd, while their produce would have a tri-fold tendency to disease by contagion and heredity and also through the agency of the milk. Outside of these bulls that have been distributed about the State, there is not a *single case remaining* above ground, that has ever been reported to me, since I have been a member of the Board of State Commissioners. *We have no contagious disease prevailing in our State to-day*, and it is not true that "there are a few

towns in Maine, where losses by this disease have not occurred." It is a "false alarm" to have that statement go out with the endorsement of the College officials, who must have been furnished their information by some party either *designedly* or who *knew nothing of the facts*. If it were true, however, there would be all the more reason why the Commissioners should be *empowered to stamp it out*. In an official experience for the past five years upon the board, I have never but once had my attention called to what proved to be a case of Phthisis, and that was the outbreak last May in a small herd of native cattle at North Waterboro', where an old and diseased cow, purchased in Shapleigh, had been introduced into the herd, and slightly affected a few heifers; one three-year old, and the weanling calf from the old cow, were destroyed, the buildings disinfected, and all settled at a very small expense to the State. In my private practice I have as yet seen only an isolated case, that of an inbred Jersey heifer, whose sire was her own "full brother," and she was afterwards destroyed. In reference to the Short-Horn cow, Rose 8th, *refusing to breed*, which was also the case with the cow Susan, sold to Mr. Boardman, and the thoroughbred Jersey cow "Hebe," about whom I shall have more to say hereafter, it is a fact well recognized among Veterinarians, that a large number of phthisical animals only exceptionally breed, or they remain totally sterile; and this absence of the procreative faculty has been indicated by many authorities, and especially by Roloff, as one of the symptoms of tuberculosis. "When the ovum is infected by the father or mother, it does not become developed, or its development is of short duration. In such a case, coition will be unfruitful, or if the infection is due to the mother, she will be rendered completely sterile." If the foetus is infected during its development, it usually becomes diseased and perishes before birth, being generally expelled from the uterus by abortion.

Having been informed by Mr. Gowell, that between the time he became Superintendent and his notice to the Cattle

Commissioners, in March last, he had slaughtered five other cows besides Maggie 3rd and Rose 8th, that all presented the same condition of glands and lungs as the cow Pet, I have since learned the first one of them that he caused to be destroyed was the grade Short-Horn cow Maggie 3rd, killed in the autumn of 1884. This cow was bred upon the farm from a cow purchased in Orono, and was about ten years old when killed. She was one of the cows turned over to Mr. Rich by Mr. Farrington in 1878. The next was the thoroughbred Short-Horn cow Rose 8th, slaughtered in 1885. This cow was put upon the farm by Mr. Rich, when she was but a few days old, and was bought with her dam in the town of Stark. The Jersey heifers "Gray Nose" and "Jersey Lily" were also killed in 1885. "Gray Nose" was bred upon the farm and was out of Hyacinthe, one of the condemned cows, (see No. 3, post mortem report) and at the time of killing was about two and a half years old. Jersey Lily was purchased when about one year old, in Rockland, Me., together with her dam "Princess Alba" (before referred to as the dam of the Kent bull) and was about two years and nine months old when killed. The Jersey heifer Brownie was also killed in 1885. She was bred upon the farm, was two years and three months old when killed, and her glands and lungs were both affected. Her dam was Juliette, (No. 32, P. M. reports). The Jersey cow Betsey was killed in January, 1886. Betsey was bred by the late Samuel Guild, of Augusta, and was bought by Mr. Gowell in 1883, and at the same time he offered Mr. Guild a very large price for her dam. Pet was killed February 21st, 1886, about ten days before I was notified of the outbreak upon the farm. Pet was bred in Sagadahoc County, and was bought by Mr. Gowell in 1882.

This summary shows that these seven cows had succumbed to the disease since Mr. Gowell had been in charge and previous to any notification to the Commissioners, all of which presented the same morbid appearance and lesions as were found in the lungs of Pet (the cow I held the post mortem on at my first visit), thus establishing the fact beyond all con-

troversy, that they were all the victims of tuberculosis, the entire absence of the characteristic marbled appearance formed by the exudation and consolidation of lymph into the interlobular cellular tissue of the lung, disposing entirely of the pre-existing theory of contagious pleuro-pneumonia, of which latter terrible scourge we have never yet had a case in Maine. The State of Maine, however, in common with other New England States is seriously menaced by the near proximity of this highly contagious disease, the only remedy for which, in my opinion, lies in the swift enactment of such wise provisions of law as shall anticipate emergencies only too likely to arise. There are now no provisions of law whatever to prevent the bringing into the State of cattle affected with either contagious pleuro-pneumonia or tuberculosis, and I believe our only safety depends upon *promptly closing the borders of our State*, against every State or Territory in which contagious diseases are known to exist. We prohibit the importation of European cattle except under a quarantine of ninety days. For the same reason precisely we should prohibit the movement of cattle out from an infected State or district, except under a quarantine of similar length. Every argument that can be advanced in support of the one is equally valid for the other, and if we allow this plague to reach our State, it will matter little whether it has come from Liverpool or New York, its virulent and deadly effect will be the same. Governor Bodwell struck the "key note" when he said in his Inaugural Address: "Fuller authority should be given to the State to destroy at once all cattle known to be affected with the disease. The owners will not do the work of destruction themselves on account of the direct loss incurred, and, therefore, the Government, as a general safeguard to the herd of the State, should assume the task and the cost of instant destruction when the disease is ascertained to exist. One neglected case that might have cost the State fifty dollars to destroy, would possibly entail a loss of many thousands of dollars to our cattle growers. It has cost England millions of dollars in her efforts to extirpate the disease, and if the con-

tagion should break out among our vast herds on the Western plains, the loss would be incalculable. Beside guarding our own State by proper enactments on the subject, I recommend that Congress be memorialized to take the utmost care and precaution, through the national power, to prevent the importation and spread of the disease."

The public cannot have forgotten the urgent warning they received by the importation of "Foot and Mouth Disease" at Portland, during the winter of 1883, showing that even the "broad Atlantic" offers no barrier to the approach of bovine scourges from "across the sea," while the alarming increase and concentration of pleuro-pneumonia at Chicago has become of sufficient importance to invoke national legislation. The last census gives the number of cattle in Maine as 334,421, and the total value of live stock as \$16,499,376, while the national investment in cattle alone is \$1,200,000,000.

There was a direct loss to the State of between three and four thousand dollars by the destruction of the College herd, and an appropriation has been asked for to restock the farm. I believe there are many reasons why this claim should be allowed, and some such improved breeds of cattle purchased as the past experience, the present embarrassments, and the future prosperity of the College demand. The farm has been brought by the present management into a high state of cultivation, and was never so well and thoroughly equipped as now for the safe and convenient handling of its abundant harvests, while the addition during the past year of another barn affords spacious and ample accommodations for sufficient stock to consume their entire crop of hay and grain upon the premises, thus enabling the farm to furnish an abundance of "home-made" fertilizers, which shall always exceed in value those of chemical production, however honestly compounded. There will, moreover, be no need of going outside of Maine to procure suitable cattle to stock the farm, for the enterprise and forethought of our most prominent stock-raisers have, by careful selection and importation, raised the standard of our beef supply until there is no good and sufficient reason why

Maine should not produce all the beef we need, and of superior quality to any we can purchase in the markets of the great West, while the splendid exhibition of cattle at our recent State and New England Fairs, have never been excelled either in "quality or quantity" in this country of Europe. While endeavoring to fully and faithfully present the etiology and termination of the College cases, I believe no better opportunity will ever be afforded me than now to discuss the causes and symptoms of the disease that has obtained so serious a foothold in our State, offering only such testimony as, while instructive and convincing, is also susceptible of the highest proof.

Walley, a very eminent English authority, says, "The insidious nature of tuberculosis has perhaps had much to do with the comparative slowness with which professional and public opinion has been directed to it, but the strides which it has made and the hold which it has gained on our stock render it one of the most important questions affecting the future well-being of the bovine species. Looking at an individual tubercle we might be led to despise its comparative insignificance, and to ignore its deadly meaning; but when we see thousands upon thousands of these knots existing in the organism of a single animal, a truth is forced upon our minds which we cannot refuse to recognize—that we have to deal with an insidious, implacable and deadly foe; and independently of its ultimate fatality, I think I may with safety say, that no morbid substance known to the pathologist is so protean as tubercle in the number of functional derangements to which it gives rise."

By common consent it seems to be conceded that Jerseys and Short-Horns are most subject to tuberculosis. Animals that are in-bred, of a lymphatic temperament, attenuated figure, light barrels and narrow chests, are undoubtedly more predisposed to tubercle, than those in which conformation may be said to be more perfect. The Ayrshires and Holssteins, are, as a rule, quite free from it, but under the influence of a change of climate they become particularly predisposed.

The solid colored and more hardy breeds, such as the Herefords, Sussex and Devons, seem to be peculiarly exempt from disease, and it is claimed that the polled Aberdeenshires never develop it, however closely bred. The bovine tribe, however, is pre-eminently disposed, equally so with man; and next in order is the common rabbit. Pigs are very prone to tubercle, and also poultry. Tubercle is rarely seen in the sheep, cat or dog, and I have never seen a case of it in the horse. Phthisis means a wasting away, sometimes called pining, but of late years the term has been mainly restricted to that species of wasting disease, which consists in the occupation of the lungs by tubercular matter. In the bovine species tubercle is remarkable for its enormous deposit in the lungs, although other parts are freely affected.

Tubercle may be confined to a non-vascular, gray, semi-transparent nodule, varying in size, in the lower animals, from a millet seed to that of a hen's egg. The conversion of the gray tubercle to the yellow is the most common retrogressive change. These tubercles, in a majority of cases, sooner or later, soften and liquefy into a condition that admits of their expulsion or escape through the bronchial tubes which communicate with the trachea; there being left in the lung in each case an excavation, a cavity or vomica. These vary greatly in size; as they may also vary in number. They may be no bigger than a pea, or they may be large enough to contain a pint or more of fluid. Opening into these cavities there is always one, and there are generally several, pervious *bronchial tubes*, which seem as if they had been cut off just where they enter the cavity, but you never, or very seldom, find a blood-vessel thus entering into the cavity; occasionally, but of very rare occurrence, a considerable blood-vessel does get laid open during the formation of a vomica, and then copious and fatal hemorrhage may ensue. The true reason why bronchial tubes open into these cavities, and blood-vessels do not, is to be found in the natural differences between these two sets of vessels, in respect to their structure. The blood-tubes yield readily to external pres-

sure, and are pushed aside, while the bronchial tubes are neither so easily compressed, nor do they carry any coagulable fluid, but their open mouths remain at a point where the tubercular matter stopped, and afford a channel, through which the same matter, after it has liquefied, finds its way toward the trachea.

According to Niemeyer, tubercular matter, when once deposited, increases in quantity, until at length it liquefies by a sort of fatty degeneration. The tubercular matter becomes soft, breaks down, and is ultimately expelled through the bronchi, trachea and mouth. It is a remarkable and very important fact, that tubercles when they affect the lungs, are not deposited at random, but in the *upper lobes*. It is here also that they first ripen and grow soft, and become ready for expulsion through the bronchi and trachea, and it is here also that we have the largest vomica. These facts have a most important bearing upon a correct diagnosis, in cases that might otherwise be doubtful, for the converse of this is true of common inflammation of the lungs. Pneumonia affects by preference the lower lobes, and there is much practical advantage in knowing these points of contrast.

In health, the lungs of bovines weighing only between six and seven pounds, are so buoyant that they float upon the water, while with lungs invaded with tubercular formations, they often weigh fifty or sixty pounds, and immediately descend to the bottom when placed in water. The liver is also very apt to undergo remarkable changes. It sometimes enlarges by becoming full of adipose matter which greases the hands and scalpel when it is cut open, the entire gland becoming soft, losing its natural red tint and assuming a pale, fawn color. Sometimes the cut surface of a liver has a whitish and glistening appearance and is then called a waxy liver, and this condition was observed in several members of the Orono herd. Tubercle kills by destroying the structures, and consequently the functions, of organs in which it is deposited.

The symptoms of tuberculosis in cattle, in its earliest stages, are sometimes involved in more or less obscurity. Prominent among these are unthriftiness, with a diminished and capricious appetite. The animals are easily fatigued, and have a weak and hoarse cough, that is almost diagnostic, the skin is sensitive and dry, and the coat staring, the mucous membranes are pale, the digestive organs are weak, and they are prone to tympanitis. There is increase of temperature, with a variable pulse. The milk is deteriorated in quality, being blue and watery, and contains a larger proportion of alkaline salts; but is less rich in nitrogenous matters, and fat and sugar, than in health, proving that assimilation is defective. In herds predisposed to tubercle they often become lame from some unassignable cause, when the post-mortem examination proves that it is due to tubercular inflammation of a joint. Flossy (No. 22, P. M.), was a marked case of this species of lameness in the College herd. If the animal is compelled to walk quickly there is labored respiration, which becomes so prominent as to assume the abdominal character, if the pleura is invaded by disease. Nymphomania, or excessive sexual desire, is also frequent, but the animal is sterile; as the malady develops, the cough becomes more persistent and easily induced, and accompanied by muco-purulent expectoration. The animals are apathetic and sluggish in their movements. Emaciation proceeds more or less rapidly, extreme debility ensues, the eyes are sunken and brilliant, the mouth is open and drawn back at the angles, the spine is arched and tender, and the breath, as death approaches, becomes cadaverous and foetid. Percussion gives dullness in some parts of the chest, and in others the normal resonance, although the members of my profession do not possess equal advantages with human practitioners, of "free and easy" access to the chest wall, owing in great part to the thick skin and hair of animals, as well as the wide distribution of the "serratus magnus" muscle posterior to the scapula—while the sound resulting from the first gentle tap upon or beneath the clavicle

in the human patient, often only too clearly reveals lesions that seal the fate of a valuable life.

Auscultation reveals an altered respiratory murmur; it is louder in some places than in others, and of a harsh and rushing sound. Instead of the normal resicular murmur, we find the "dry crackle" which is associated with incipient tubercle, the cavernous or bronchial sounds which occur during the passage of air into or out of a cavity in the lung, and the humid crackling or gurgling rales, which are pathognomonic of advanced tuberculization, and heard during the later stages of nearly all cases of consumption. Large crepitation depends upon the passage of air through liquids, but when pus, or liquid matter of any kind is collected in a vomica, which communicates freely with the trachea thorough pervious bronchi, the bubbles produced by the entrance and exit of air will be still more numerous and large; and a sound is then produced which the word gurgling well expresses. Whenever, therefore, we hear gurgling during respiration or during the act of coughing, we conclude we have a cavity. Another constant accompaniment of progressive phthisis is emaciation, and if, without any apparent cause, an animal grows thin and weak, with a quick pulse and labored respiration, these indications are pregnant with meaning that tubercular disease is at work in the lungs, and is consuming life. The detection of the disease is sometimes difficult. It is easy when the tubercles are numerous, large or far advanced; difficult when they are scanty in number, thinly scattered and individually small, and in the latter case would not cause any appreciable deviation from the natural resonance of the chest on percussion, or from the natural smooth, equable rustle of the breathing. The disease always terminates fatally, if the animal be permitted to linger on, and it dies in a state of extreme marasmus. The International Veterinary Congress, held at Brussels, in 1883, to discuss the Influence of Heredity and Contagion on the Propagation of Tuberculosis, in summing up their labors, arrived at the following conclusions.

1st. Tuberculosis has been observed in all warm-blooded animals submitted to domesticity or deprived of their liberty.

2d. Tuberculosis in animals and mankind presents analogous manifestations, in the living as in the dead creature.

3d. The course and termination of the disease in mankind and animals is the same.

4th. The masses of tubercle, and especially the sputa of the phthysical, produce tuberculosis in animals, when these matters are introduced through the respiratory or digestive apparatus, or through a deep wound. Tuberculosis inoculated from man to animals, may in its turn be transmitted from one animal to another, and always produces tuberculosis.

5th. Tuberculosis of man and of animals is transmitted by heredity.

6th. The disease is contagious in man and animals.

7th. Clinical observations prove the transmission of tuberculosis from animals to man by consumption of the milk of phthysical animals.

8th. Tuberculosis of animals and man is rare in cold climates. It is most frequent in southern countries; the tracings of the geographical propagation of the disease in man and animals is nearly parallel.

9th. It is evidently proved that a pathogenic microbe, having the same morphological and biological characters, exists in the tubercle of man and in that of animals. This organism, whether it be developed in man or animals, may induce Tuberculosis when, cultivated in a pure state, it is conveyed to the animal possessing the necessary receptivity. According to Koch, the bacteria of tubercle manifest themselves in the form of threads of extreme tenuity, in length scarcely one-half the diameter of a red blood-corpuscle, and in breadth at most one-fifth of their length. They are non-motile, without proper motion, and form spores which are developed during the life and in the body of the affected creature. They are never mixed with micrococci or other bacteria in tuberculous centres protected from the air. First and foremost among pre-

disposing causes in the propagation of Tuberculosis, among bovines, is its hereditary tendency.

According to Walley, "Hereditary tendency may be divided into direct and indirect: the former when it is transmitted by a sire or dam to its immediate progeny, the latter when only transmitted to the second or third generation—constituting atavism. No predisposing cause with which we are acquainted, exercises such a potent influence in the production of tubercle as this: from sire to son, from dam to offspring, from generation to generation—often in unbroken succession—the fatal tendency is transmitted: the more consanguinity is multiplied, the more the tendency is increased, and the greater the virulence of the resulting products. No animal whose history is tainted, even in the slightest degree, or in whose system there exists the least suspicion of tubercle, should be used for breeding purposes." The disease is so insidious in its attacks that, when you think you are all right, it may appear in a grand-child of what was considered a very healthy animal, and outbreaks will occur years after all has been seemingly healthy, or it may lie dormant in an apparently healthy parent only to be regularly and certainly produced in their offspring.

Dr. J. H. Stickney, of Boston, one of our best men, and a graduate of human as well as veterinary medicine, tells me of an interesting case in point in Western Massachusetts. A client of his had sold a young bull, with "a long pedigree" at "a long price," and before being delivered the youngster had developed a slight cough. Upon Dr. Stickney's attention being called to the case, he at once pronounced it tuberculosis. The dam of the bull was shown him, and after a critical examination of her, the Doctor failed to discover the slightest indication of disease about her, but when he came to examine the grand-dam, who had been purchased at one of the "New York sales," he found her lungs and glands to be thoroughly invested with tubercle. This aroused the suspicion of the owner that the animal possessed the hereditary taint when he purchased her in New York, and upon ascertaining from

what herd the animal was contributed to the sale, he visited the farm, only to find his suspicions well grounded, and that tuberculous animals were regularly disposed of whenever the primary symptoms became apparent. These men are always on the alert with regard to animals they breed, and are always anxious to dispose of them whenever they show any suspicious or morbid symptoms. In this way "suspects" find their way into sound herds, only to communicate to them the germs of the transmissible diseases with which they are affected.

Professor Law, of Cornell University, in his report to the Department of Agriculture, of the contagious diseases of our domestic animals, says that "twenty, thirty, and even fifty per cent of certain herds that supply New York City with milk are affected with this disease. In some country districts can be shown large herds with ninety per cent subjects of tuberculosis."

Some startling discoveries have also recently been made by the State "board of health," at San Francisco, California.

The "board," accompanied by a veterinary surgeon, inspected ten or a dozen dairies reported to them, and from one of them a cow suffering from consumption was purchased for the purpose of experiment. Dr. E. V. Hopkins, who is regarded as a microscopic specialist of high reputation, was engaged to make examination upon the milk of the consumptive animal. "The analysis was made," explained the doctor, "with a view to discovering whether the bacilli, or the consumptive disease germs, are found in the milk of the diseased animal. If these germs are found in the milk, then the disease is capable of being transmitted to the persons who use the milk. The cow was brought to me on December 1st, I think, and we kept her about two weeks. I made several experiments during that time, as these will indicate"—exhibiting a box of microscopical glass slides carefully labeled. "I allowed the milk first to stand two days, until the cream had thoroughly risen to the top. One drop of this cream sufficed to prepare four slides. In order to bring the bacilli to view and distinguish them from surrounding matter, it was necessary to strain them."

Dr. Hopkins here slipped one of the prepared slides, upon which a drop of the milk had been dried, on his microscope of 1500 magnifying power, and adjusted it for the reporter's eye. The milk presented an almost transparent appearance, and against it as a background there were to be counted a half-dozen reddish lines, perhaps an eighth of an inch long, apparently. "Those colored lines which you see," said Dr. Hopkins, "are the disease germs of consumption. Transmitted in the living form to a person or other living being, they are liable to plant the fatal disease. The bacillus is a division of the bacteria, one of the very lowest forms of living vegetable life which exist in the blood, flesh and various forms of animal and vegetable life. According to the most advanced developments of medical science, it is held that all infectious diseases are due to the presence of bacteria—each disease has its representative species of the bacteria. The bacillus is long and tube-like, made up of infinitesimal spores, only made visible by the most powerful microscopes. Thus diphtheria, typhoid fever, leprosy, consumption, cholera and other contagious diseases have their separate germs which, to the eye of one understanding their nature and character, are recognizable and distinguishable one from the other. Other diseases, such as scarlet fever, measles and erysipelas, are due to micrococci, a round-celled form of bacteria. But those you see in the microscope are the disease germ of consumption, and from which the disease is developed. From all of the analysis of the milk from this consumptive cow I have found these bacilli."

"And would the disease be transmitted to those who use the milk merely by the drinking of it?"

"That would depend upon the health and delicacy of the organs of the person who drinks the milk. For children and babies, whose stomachs are yet delicate and susceptible to disease, the transmission cannot be avoided. Any baby who should drink this milk could not avoid being inoculated with consumption. With healthy adults, whose organs are less

susceptible, the danger is less, though the germs will attach themselves to any organ which is weak."

"How many dairies have you thus examined?"

"Five, thus far."

"And in the milk of how many did you find the bacilli of consumption?"

"In four. That, of course, is a startling discovery. It is but just, however, to state that I chose dairies which I thought most likely to have diseased cattle."

"Was the milk that you examined taken from any one special cow?"

"No; I took the milk as it was delivered from door to door. The dairy proprietors were informed of the discovery and they have promptly separated the diseased cows from the others, I am informed. Of course a cow may be in the first stages of consumption and have no outward appearances and yet promulgate the germs. There may be only one diseased cow in the dairy. Yet the fact remains that after this cow's milk has been mixed with that of many others of the herd, I find in one drop of the mixture the germs of the deadly disease."

Dr. Hopkins had also prepared microscopical slides with minute portions of liver, blood, udder and lungs of the diseased cow that had been killed. All showed the bacilli, and the liver revealed a perfect mass of germ clusters.

Steele, a prominent English author, says "Tubercle and cancer are hereditary disorders, and the immature cancer or tubercle elements may have been transmitted from the parent, and have remained in a dormant state, until surrounding conditions become favorable to the display of their full vigor. This view seems to derive support from the fact that just as in due time each feature of development appears in the progeny as in the parent, so tubercle appears at a fixed age, which is the same in each."

Dr. Krunitz, on heredity, remarks, "After having sustained considerable losses for many years, owing to the employment

of phthysical animals for breeding purposes, the owner referred to got rid of the scourge which had so long ravaged his cow-shed, by selling his bulls, and gradually ceasing to breed from cows which, until then, had been used for this purpose." A remarkable case, proving the transmission of the disease from the male parent to progeny is published by Zippelius. "A stock breeder purchased a bull, and with him served ten of his cows. The bull was found to be affected with tuberculosis, and for this reason was killed. All the calves of the ten cows which had been put to this bull had eventually to be slaughtered because of this affection. The first symptoms of the disease in the calves were manifested when they passed to adult age." And so in human statistics it is a fallacy to suppose that youth is considered the harvest time of consumption, or middle age the extreme limit of the period within which the whole crop is garnered, the post mortem records of many hospitals showing that a large percentage of persons who die over sixty years of age are afflicted with pulmonary consumption; less between the ages of ten and forty, than it is between the ages of forty and seventy. It is said "that forty is the old age of youth, and fifty is the youth of old age." The seeds of disease being sown early, the malady matures later in life. According to abstracts prepared by Goring, on the sanitary condition of animals in Bavaria in 1878, 5052 tuberculous cattle were apportioned as follows:

65 were less than a year old;  
 551 were from one to three years;  
 1730 were from three to six years;  
 2360 were more than six years.

Although it is very rare that tuberculosis commences during foetal life, yet it is notorious that a tuberculous cow transmits to its descendants a predisposition to the disease. Williams says that "it is not only hereditary but congenital, and I have seen a calf three months old, which had thriven well

until within two or three days of its death, filled with caseous, calcareous and gray tubercular tumors. In this calf the whole of the serous membranes were affected, which must have been formed *in utero*. The mother of this calf seemed a healthy animal, but was of spare form and had a capricious appetite. Adam relates an instance from among many others in which the lesions of the disease were observed in a calf which died a few hours after its birth, the mother at the time being affected with tuberculosis. Semmes relates five cases of phthisis which he met with in foetuses of cattle, and says these cases sufficiently prove that tuberculosis may be developed during the embryonic period, and that it is readily transmitted through heredity. Muller slaughtered a calf derived from a tuberculosed cow. At the autopsy, several nodules were found on the costal and pulmonary pleura, and the lymphatic glands (greatly increased in volume) had undergone caseous degeneration. Muller concluded from these facts that the disease is transmitted from mother to progeny, and that the latter from the moment of birth may possess not only the predisposition, but even present the patent lesions of the malady. Gerlach thought that heredity had so much influence in the propagation of tuberculosis, that it was sufficient to have a few tuberculous bulls in a herd to infect the whole, especially if in-and-in breeding was the rule. George Fleming says that "*animals descended from tuberculous parents inherit a special predisposition to the disease*. As there is every reason to believe that the malady is hereditary, cattle having any tendency to it should not be bred from. We may specially consider, as causes inherent to the development of the predisposition, the ever-increasing mass of connective tissue in improved and improving breeds of cattle and pigs, more and more specialized for the production of milk and fat. That exaggerated activity of the vegetative life in the absence of proportionate muscular exertion—that fatty degeneration which is met with in most of the tissues of these animals—does it not remind one of hot-house plants?" In human med-

icine an analogous, if not identical opinion has been entertained from the earliest times to the present day, and it is indeed astonishing that in the presence of this evidence the existence of a predisposition to, as well as the hereditary transmission of the malady should not have been accepted without discussion. Niemeyer admits the frequent occurrence of an inherited disposition to pulmonary phthisis, and holds it to be a *cardinal fact*, that the most essential element in the production of phthisis is *constitutional predisposition*. The contagiousness of tuberculosis has been admitted from very remote times by many eminent pathologists, while others have questioned or denied its existence. My experience with the recent cases at Orono has greatly strengthened and confirmed the conclusions to which my teachings and belief had been previously directed, that the disease is both contagious and hereditary.

The Maine State Board of Health, in a concise and instructive circular, recently published, on the Contagious Diseases of Animals say that tuberculosis or the "Pearl Disease" of cattle is essentially the same disease as human consumption. It is both contagious and hereditary, but contagion, in animals at least, is a greater factor in its propagation than heredity. Of the domestic animals, cattle and swine show the greatest predisposition to tuberculosis; though others are liable to contract the disease when exposed to its infection. Between tuberculosis and pleuro-pneumonia there are many points of resemblance. Both are contagious, the period of incubation in tuberculosis is long, and it may be in pleuro-pneumonia; fever and the lung symptoms are common to both, and the disease in both often assumes a concealed form; dangerous to the remainder of the herd from the difficulty of its recognition. When either disease is suspected, the determination of its character should be made by the veterinary surgeon. Dr. Salmon, Chief of Bureau of Animal Industry, says, "An animal may be infected by a particle of contagious matter floating in the atmosphere and so small as to be invis-

ible to the naked eye ; but in a few days or weeks, when the period of incubation is passed, every drop of blood and every particle of flesh in the infected animal may become as virulent as the original infecting particle, and every breath exhaled is loaded with infectious atoms which carry disease to other subjects. A diseased animal may, therefore, be looked upon as a factory which goes on manufacturing and distributing contagion, day and night, in enormous quantities.

Dr. Blaine, Assistant Physician to the Willard Asylum for the Insane, at Willard, N. Y., has recently contributed to the "Medical Record" a paper on bovine tuberculosis ; its communication by ingestion, inhalation and hereditary transmissions ; also its dangers to the public health, in which he gives a full account of the sudden outbreak of tuberculosis, whereby the Asylum sustained a loss of nearly two hundred head of valuable Holsteins. Dr. Blaine says, "I now wish to call your attention to certain clinical observations that were made by myself of the herds at the Willard Asylum, extending over a period of two and one-half years. During the fall of 1883 tuberculosis broke out in an acute form in the Asylum herd, which consisted of about one hundred head of milch cows and forty head of young stock, most of which were of Holstein blood, and with the exception of a few head, all were in excellent condition and thought to be in perfect health. During the summer months, however, a number of the cows were noticed coughing, which attracted some attention, but nothing of a serious nature was suspected until late in the fall, when those that had been noticed coughing began to emaciate, presenting in general a very bad appearance ; the hair seemed dead, having lost its gloss, standing erect, cleaving from the skin. Their eyes were sunken and presented a heavy appearance. The animals did not move about and usually lingered behind on going to and from pasture, and if hurried, they seemed exhausted from want of breath. My attention was called to them, and on examination I found in several cases an entire absence of respiratory murmur over

the greater portion of either lung, and where the respiratory murmur was perceptible I detected moist rales, and in places the rales had assumed a resonant character, which indicated consolidation. A severe diarrhœa had now developed, which was very offensive, and the milk supply had gradually lessened for several months. Finally it was thought best to kill one of the feebler ones, and ascertain the true nature of the disease.

*Case I.* The animal chosen for examination was eight years old, of Holstein blood, and one year previously would have weighed 1,200 pounds. On the post mortem, the animal was found highly tuberculous, and there seemed to be no organ in the body free from the disease. The lungs were voluminous and double their normal weight. They were completely adherent on either side, and the left lung on section seemed to be one mass of tubercular deposit. Small vomica had formed in some places, in other places the deposit was calcified, and in still others, cheesy. The bronchial glands were three to four times their normal size and degenerated. Numerous tubercles the size of hazel-nuts and smaller, were found upon either surface of the diaphragm, and the liver was found at least three times its normal size and contained large masses that would equal in weight several pounds. On cross-section it revealed large cavities filled with a muco-purulent mass. The bowels were covered with tubercles, and in a state of subacute inflammation. All of the abdominal organs were more or less affected, also the milk-bag, which contained several large deposits, some of which were calcified, and others softened and in a semi-purulent state. All the glands throughout the body were enlarged, and in places degenerated.

*Case II* was that of a Holstein six years old, much emaciated, and suffering from a chronic diarrhœa. No respiratory murmur was heard over the right side of chest-wall except at the apex. General enlargement of the superficial lymphatic glands, also of the sub-maxillary and thyroid. Post-mortem

examination: Lungs completely adherent on either side, and differing in no respect from those in Case No. 1. The lungs, with the heart and deposit intact, were removed and weighed, which weight equalled thirty-nine and one-half pounds. Deducting the weight of the normal lung and heart intact, we find about twenty-four pounds of tubercular deposit. The liver was double its normal size, and on section large quantities of muco-purulent fluid escaped; the mesenteric glands were degenerated, and the bowels were completely studded with tubercles about the size of peas. The milk-bag contained one large deposit between its two lobes which was calcified. The finding of these two animals so badly diseased, there being others that were failing and manifesting similar symptoms, naturally created a great amount of anxiety on the part of the medical superintendent, Dr. Chapin, who requested that I should make an examination of the whole herd. On making such an examination, twenty-four were found manifesting symptoms of the same disease, besides several that were considered questionable. Finding so many diseased, they being the property of the State, it was thought best to seek advice from one of our State veterinarians, as to what means were best to adopt. Professor Law, of Cornell University, was sent for. After making careful examinations of the herd, he reported that twenty-six were diseased, and that he considered several suspicious, as they manifested some symptoms of the disease, although he was unable to detect anything abnormal on auscultation. He advised the killing of all those that were diseased, the isolation of those that were considered doubtful, and a thorough disinfection of the stables. Having in the herd a full-blooded Holstein bull, it was considered quite essential to know if he was affected, although he had not manifested any symptoms of the disease. Upon careful examination nothing abnormal was detected. Professor Law's examinations were made March 22, 1884. Many of the diseased animals remained in the herd for several weeks, when the herd was again exam-

ined by myself. I found those that only a few weeks previous were considered doubtful had now developed positive symptoms of the disease, and still others were found that seemed quite suspicious. The bull, at this time, appeared to be failing in flesh, but manifested no positive symptoms.

On May 22d and 23d twenty-eight of the most advanced cases were killed. On examination all were found affected, but not all to the same degree. The organs principally affected were the serous membranes, the lungs, liver, bowels, and the milk-bag in many cases. A number of them were affected to an equally great degree as the two cases I have already reported. Examination was again made of the herd on June 10th, and others were found manifesting the usual symptoms; the bull was again examined and it was very apparent that he was affected, although he had not manifested any cough, but he was rapidly losing flesh. He was then weighed and was found to weigh 2,456 pounds. He was again weighed on July 10th, and his weight was then 2,290 pounds, and as at this time it was very evident that he was also affected, it was decided to kill him. On post mortem we found a large deposit in the central portion of the left lung, and numerous small tubercles upon the left pleura. The bronchial glands were greatly enlarged, and on cross section were found calcified. There were many tubercles upon the peritoneum and bowels. The liver in this case seemed free from disease. Upon the glans penis were several small tubercles, and in one place it appeared as though several had coalesced and had broken down, leaving a cicatrix. Had this been ulcerated, one might have thought it a soft chancre.

Leaving the herd at present, I wish to call your attention to the calves that were born during the winter and spring of 1883-84. Writers tell us that it is not an unusual occurrence for animals well advanced in tuberculosis to abort. This seems to be true, as such was the case in this herd. I observed that eight calves were prematurely born, two of which required assistance at birth, as the mothers were much

exhausted. One of the two that was removed was in about the eighth month of gestation. This foetus on examination was found saturated with tubercles, some of which were as large as peas, and on drawing a knife across them they were found calcified. Tubercles were found in the liver, bowels, diaphragm and chest-wall, there being none observed upon the lungs. The mother of this calf was killed some weeks afterward and was found highly tuberculous, the disease being well advanced to the third stage, or stage of suppuration.

No. 2 was from a diseased mother, also in about the eighth month of gestation. On examination I found the liver, diaphragm and bowels quite thickly studded, but the tubercles were much smaller than in the preceding case. Of the other six prematurely born, I was able to examine only two, as the other four had been destroyed before I was acquainted of the fact. One of the two, however, that I did examine was found to have a tuberculous liver.

During the winters and springs of 1883-84 and 1884-85, fifty-three calves were born to the herd, and each one was examined with reference to the disease. Twenty-nine of the number were found tuberculous in some of the viscera. The greater number of the calves were killed within five weeks after birth, and the whole number before the expiration of four months. I will only call your attention to the most interesting cases. One calf killed at the age of five weeks was found highly tuberculous. The liver was double the normal size and covered with tubercles. On cross section it was found to contain a large vomica, filled with at least one pint of fluid of a muco-purulent character. Tubercles were also found upon the pleural surface of the left lung; also an extensive deposit in the apex of the same lung. The mesenteric glands were enlarged and cheesy. The bowels were thickly studded and in a state of subacute inflammation. This calf had suffered from a severe diarrhoea for several days, and had failed considerably in flesh.

The mother of this calf was killed shortly afterward, and was found badly diseased. Among the organs affected was the milk-bag, which contained a large tuberculous abscess. In this case does it seem possible for the disease to have been acquired wholly after birth? To my mind it does not seem possible that the disease could have developed with sufficient rapidity to produce an abscess of the liver in such a limited time. However, I am of the opinion that the intestinal lesions were produced, to a great extent, from the milk of its mother, as undoubtedly the milk must have contained elements of the disease.

In another calf, seven weeks old, the left lung was adherent to the chest-wall at the apex, where there was a large tubercular deposit. Also there were many small tubercles upon the lungs and in other places. The liver and bowels contained many tubercles of the size of peas, and on cross section were found in a state of cheesy degeneration. In the remaining cases the lesions were not as marked, but the disease was none the less apparent.

You now have the history of the herd up to June, 1884, and we find that nearly one-half of the herd of milch cows has been disposed of, all that were supposed to be diseased having been killed. The remainder of the herd were observed from time to time, and examinations repeated every twenty to thirty days; and upon each examination new cases were discovered, which were immediately removed from the herd, as it was thought they could be fattened and made use of.

The sorting out and feeding continued for several months, and at the time of killing many had not gained at all, while others had taken on considerable flesh; but upon killing only five were found fit for use, and four of these were slightly diseased in some of the viscera.

During the spring of 1885 a number of young heifers, which had been kept upon another portion of the farm, were with calf by the bull killed in June previously. Before put-

ting them with the old herd they were examined, and many of them were found diseased. It was deemed advisable to kill them. The calves of these heifers were all diseased, *the disease in one calf being traced directly to the bull*, as the mother was found unquestionably healthy. The remainder of the young herd which had been exposed to the disease were put with the remaining portion of the milch cows, and the combined herds now numbered forty head. The examinations were still continued from time to time, during the summer and fall of 1885, and occasionally one was found manifesting the usual symptoms of the disease. This procedure was continued until the spring of 1886, when it was thought advisable to feed the remainder of the herd. During the past summer all were killed except ten, which have been killed during the past month, and in nearly every case disease could be found in some of the viscera, and some were badly diseased, as I will show you from specimens that I have here. The specimen that I wish to show you is very interesting, inasmuch as it shows that one is not able, at all times, to tell whether or not the animal is diseased. You will observe that the disease, in this case, is confined wholly to the bronchial glands, there being no other organs affected — that is, as far as I have been able to determine. Auscultation of the lungs in this case revealed nothing abnormal, and the superficial lymphatic glands were not enlarged, and the animal had manifested a cough. The bronchial gland, in a healthy cow, is about four or five inches long, about one inch wide, and one-half inch in thickness. Here we have a specimen, removed from a Holstein cow nine years old, in which we find the gland is about ten to twelve inches in length and nearly six inches in thickness. This, on section, we shall find in some places calcified, and in others cheesy. I also have other specimens here, removed from another case, in which no disease could be found except in the glands, and these without apparent enlargement.

During the winter of 1883 the asylum purchased a full-blooded, registered, Holstein bull-calf, from one of the leading breeding firms of this country. This bull was kept from the herd until old enough for breeding purposes, and then only came in contact with the herd as occasion required. This animal thrived until April last, when I noticed that he began to manifest symptoms of the disease. He was examined at frequent intervals during the summer, and each examination confirmed the previous diagnosis. He was killed on November 16th, last. Previous to being killed he weighed nearly two thousand pounds. On post mortem I found the left sub-maxillary gland enlarged and suppurating, the thyroid gland enlarged and calcified, and several deposits in the left lung about the size of walnuts; also tubercles upon the peritoneum and bowels. The liver, in this case, was free from disease. The glands and portions of the lungs I have here for your inspection.

The only possible objection that could be raised regarding the care of these animals was that of ventilation. The stables were kept scrupulously clean, being washed out daily, and there were no cess-pools about the barns or yards. The barns are situated upon a side-hill, thus affording the best possible drainage.

Their food was of the best of hay, corn fodder, bran and vegetables. In the spring of 1884 all of the animals were removed from the barns and put in pasture, and open sheds built for their protection.

During the following winter the animals were confined in the barns only during the time of feeding and milking, they being out during the day and protected at night by sheds open on one side.

Also in the breeding of this herd of stock there was the greatest amount of vigilance exercised in order to avoid in-breeding. Frequent changes were made in the bulls; new cows were bought from time to time of the farmers throughout the country, and these crossed with the Holstein bulls,

and at the time of the outbreak of the disease about one-third were animals that had been purchased. In my mind it does not seem possible that the disease, or dyscrasia, had been inherited in all cases. Therefore, if the disease was not inherited in all cases, it must necessarily have been acquired; and if acquired, through what channel did the disease enter the animals' system?

There appear to be only two channels in which it could have entered, the one by inhalation, the other by ingestion. In order to prove that the disease is communicated by inhalation, we have to resort to experiments, but by ingestion we have many striking examples in which it is plainly shown that the disease is acquired by the use of milk and meat of tuberculous animals. In proof that the disease may be acquired by the ingestion of tuberculous substances, allow me to call your attention to the Asylum herd of swine, which numbered nearly three hundred head. These animals were kept in different yards. In one, the breeding sows; in another, the half-grown pigs; and in the third yard, which was adjoining the slaughter house, were kept the large hogs which were being fattened. The hogs in this latter pen had access to the offal from the slaughter house, where a number of tuberculous cows had been killed. Later in the fall a number of the large fat hogs died suddenly in full strength, and on post mortem were found highly tuberculous. The disease, however, did not present the same pathological conditions as in the cows. The disease seemed more especially confined to the abdominal viscera and the glandular system, the lungs being rarely affected. In those cases that died suddenly I found a tubercular peritonitis, to which was attributed the cause of death. During the killing season many were found diseased, there being metastatic abscesses in different portions of the body, but more especially in the side; and in the sows the rudiments of the milk-bag were often the seat of abscess. Also the joints were frequently affected, many of the hogs, both large and small, became lame. During the winter a number of them became partially paralyzed in

their hind parts. The paralysis progressed, and finally they were unable to use their hind limbs at all, and for several days three of them moved about, walking upon their fore limbs and dragging their hind parts. Still they were fat and seemed to eat equally as well as the others. Finally they were killed, and on post mortem the bodies of the vertebrae in different portions of the column were found to have undergone caseous transformation. The cord at these points was softened, and in some cases completely obliterated.

After the killing of all the swine that had access to the of-fal, and disinfecting the yards, we have since had no more disease in the herd."

There is a remarkable similarity in the symptoms and post mortem appearances of the Willard herd, and that of the State College, and proves conclusively that any other course than that adopted at Orono, in the disposal of their cases, would have been suicidal to the best interests of the State. With the comparative freedom from disease we now enjoy, it would seem like inviting disaster for us to hesitate, or parley longer, to recommend immediate action on the part of the proper authorities, to stamp out every vestige of disease remaining in our State, and in this respect, as in all others, to live up to the proud motto emblazoned on our "State shield" and still continue to "lead the way." Fleming says, "The influence of contagion on the propagation of tuberculosis has been affirmatively solved, for we have furnished ample proof of its hereditary transmission; this transmission being nothing more than the infection of the ovum or foetus through the medium of the parents. The reality of the infective action of the disease has already been demonstrated as well as its transmissibility from one individual to another in the special case of ascendant or descendant. As there is, however, a difference between the transmission of a disease from the producing animal to the product, on the one hand, and from an individual to another simultaneously existing, on the other hand, we are compelled to draw a distinction between hereditary transmission and contagion, properly speaking; and we

cannot forbear from treating, in a special manner, of the conveyance of this disease through actual contact, that is, from one individual to another, both existing at the same time and enjoying life essentially independent of each other. The morbid principle may arrive in the organism by the respiratory or the digestive tract; the inspired air, the food, or the drink may be the medium; and the contagion may also be transplanted by means of the generative organs (through copulation) or by accidental means, by wounds." Stahl has witnessed tuberculosis develop in five bulls in one stable, which were kept for the service of a commune. These bulls were not related in any way by parentage, and he attributes the outbreak of the disease to the purchase of a tuberculous bull, which, by its presence, infected the others.

Renner reports, that a pregnant cow, newly purchased, was placed beside a tuberculous cow. The calf produced by the former was apparently healthy at birth, but five or six weeks afterwards it was attacked by shiverings, fever, fits of coughing and great dyspnæa. The tuberculous cow was killed, and soon after the calf showed evident symptoms of tuberculosis. In 1864, Villemin, with a view to study the infective action of human tuberculosis, made some important experiments that produced a profound sensation in the scientific world, and came to the conclusion that tuberculosis is an infectious and specific malady, capable of being transmitted from men to animals, and from one man to another. A German veterinarian, Albert, contributed a very thoughtful and interesting paper in 1880, on the tuberculosis of cattle as an infective disease, and says, "Although heredity is unquestionably a very important cause in the generation of this disease among cattle, still it does not suffice to explain the great extension which the same acquires among them; especially is it insufficient in answering for the eruption of the disease among cattle in stables where no breeding takes place, or where the young animals are brought in from other farms. In such stables other causes must be brought into action, and these are the transmission of the disease from one animal to

another. I have observed that when there is in a stable one individual which contains in its organism the conditions necessary to the extension of the disease—tubercular process in the lungs—the disease extends to the other animals in the same stable which have been there for a sufficient period.” He cites a case on a farm where were kept from twenty-four to twenty-six head of cattle. In 1864, the owner bought a calf to bring up, the mother of which died a few years later of tuberculosis. This calf developed very poorly for the first two years of its life, and was killed in the fall of 1869. In the course of the following winter, many of the cattle began to cough, and among them, two, A and B, so severely that my services were requested. I found all the animals in an apparently healthy condition; only A and B were noticed to cough. At this time I knew nothing of the breeding, or the phenomena seen in the above mentioned calf, which had been slaughtered.

All the animals on the farm coughed during the winter of 1870–71, at which time the two cows, A and B, began to emaciate so much that it was considered advisable to kill them. The autopsy revealed the general characteristics of tubercular pneumonia, and tuberculosis of other organs. Basing my opinions upon the previously mentioned experience, I made no hesitation in pronouncing all the cattle in this stable that coughed afflicted with tuberculosis, and I advised the owner to get rid of them all.” Chauveau has already observed that heifers which feed out of the same trough become tuberculous whenever a phthisical animal is found among them. Grad quotes evidence to prove in the most conclusive manner that not only is the disease communicable by cohabitation of healthy with diseased cattle, but that stalls and stables may become so contaminated by animals suffering from tuberculosis, that they infect sound cattle which afterwards inhabit them, until thoroughly disinfected. Toussaint, Professor at the Toulouse Veterinary School, made numerous experiments to demonstrate the contagiousness of tuberculosis. For these investigations, which required thousands of animals, he employed pigs, rab-

bits and cats, as the disease is more surely and rapidly developed in them. The fluid expressed from the lungs of a tuberculous cow was that which he employed. He injected into four rabbits ten drops of this fluid, which was nearly transparent. He afterwards heated the fluid to a temperature of 58 degrees for ten minutes in a water bath, and inoculated four pigs and four rabbits with it. All these animals became tuberculous, and the four which had been inoculated with the heated material perished even more rapidly than the others. Three rabbits were inoculated at the base of the ear, with the transparent mucus that flowed from the nose of a phthisical cow. In about two weeks there appeared a tuberculous nodule at the seat of inoculation, and the lymphatic glands were turned. Seventy days after inoculation the rabbits were killed, and in their lungs were found tubercles, the majority of which were gray and some were already undergoing caseation.

That the sputa from people afflicted with tubercular consumption contains elements capable of infection, has been placed beyond all doubt. Experiments made by Dr. Tappeimer, and published in Virchow's Archives, are of great interest. The animals experimented upon were made to breathe for several hours daily in a chamber in the air of which fine particles of phthisical sputum were suspended. The sputum having been mixed with water, the mixture was atomized by a steam atomizer. In all cases the sputa were from persons with cavities (vomica) in their lungs. Dogs alone were employed in the experiments, since they very rarely suffer from tuberculosis. The result was, that of eleven animals experimented on, with one doubtful exception, after a period varying from twenty-five to forty-five days, all, being killed, presented well developed miliary tubercles in both lungs; and in most of the cases tubercles were present to a smaller extent in the kidneys, and in some cases also in the liver and spleen. Dr. Reiche of Berlin, sums up his observations on the infectiousness of the breath of persons afflicted with tuberculosis as follows: "In these cases the disease was *transmitted to ten children* by a nurse

who had the habit of sucking at and blowing into the mouths of such little ones as were born asphytic. There was no ascertainable disposition to tuberculosis in any of the ten children. All these children were brought into the world by the nurse Sanger, between April, 1875, and May, 1876. This nurse suffered from tubercular consumption at the time. In July, 1875, an examination of her lungs revealed cavities in the same, and she raised purulent ichorous sputa. She died from the disease in July, 1876. Nurse Sanger had the habit of removing the mucous from the babies' mouths by means of suction with her own; and in general treated children in a manner which rendered it possible for the expired air from her own lungs to get into theirs by kissing, etc."

From the clinical observations already cited as well as the numerous experiments which have been made, tending, as they do, to establish the infectious character of the malady under consideration, it evidently results that tuberculosis is a contagious malady, equal in infectiousness to glanders and contagious pleuro-pneumonia. Inoculation has also demonstrated that the tubercular matter preserves its virulence through three or four removes; and successful inoculations have been made with tubercular matter from a patient who had been dead for thirty-six hours, and with sputa which had been in a dried condition for twenty days.

When we come to consider the transmission of the disease through the use of milk, we reach a point of vital importance to every man, woman and child in the community, and the conviction that the consumption of the milk of phthisical cattle constitutes a veritable danger, is gradually penetrating society, and daily gaining ground. The first intimation that some infectious elements were contained in the milk of cows having this disease is due to Gerlach, the most noted of German veterinarians, and late director of the Royal Veterinary Institute at Berlin. Having a cow afflicted with tuberculosis, that still gave milk, it was resolved to use the same to test the question whether the milk from such a cow is capable of producing a similar disease in young animals when fed upon

it. The cow was seven or eight years old, much emaciated, respiration difficult, and had a rough weak cough. After a lapse of three months the cow was killed. The emaciated condition had gradually increased, the milk-secretion likewise diminishing; although the animal received all the nourishment she could consume. The autopsy disclosed numerous tubercles of various dimensions upon the inner thoracic walls, the diaphragm and the mediastinum. The lungs were voluminous and double the normal weight. A healthy, well-nourished calf, eight days old, was fed with the milk from the above-mentioned cow, for a period extending over one and two-thirds months. Neither phenomena indicating the presence of disease, nor disturbance of the nutritive functions were observable. The calf was killed one hundred days after the experimental feeding began, and upon post mortem, tubercles were found in the lungs, and miliary tubercles were seen in the loose interlobular tissue. The bronchial lymph-glands were much enlarged and inwardly disturbed by many purulent and caseous cavities.

Gerlach says, "There is every reason to prohibit the use of milk from cows affected with tuberculosis, and especially for infants, who mainly rely upon this fluid for their subsistence, and whose powers of absorption are very active."

The milk from a tuberculous cow had been used for some time in a cooked condition, but the cow finally became so bad that it was decided to give the milk to the hogs, but uncooked. The farmer's wife noticed that the young pigs (four or five months old) fed upon this milk did not appear to thrive well, and as, in the course of a few weeks, three died, I was requested to make an examination of the last one. I found the pig much emaciated. The mesenteric glands were enlarged, and found filled with tuberculous mass, with tubercles in the liver. In the course of a few weeks the remaining pigs of the litter also died, and were found tuberculous on being examined.

The following case of transmission of bovine tuberculosis to man is related by Dr. Stang of Amborach: A boy, five

years old, apparently strong in constitution and descended from healthy parents, whose progenitors were exempt from hereditary disease, was attacked with scrofula, and died in four weeks from miliary tuberculosis of the lungs and enormous hypertrophy of the mesenteric glands. When making the autopsy, it was accidentally ascertained that some time before, the parents had to destroy a cow, which, according to the testimony of the veterinary surgeon, was affected with pulmonary phthisis. The animal had been a good milch cow, and for a long time the boy had received a quantity of the milk, immediately after it was drawn.

At the annual meeting of the National Veterinary Association, held in London, in 1883, Dr. Hopkin said: "I had an assistant who came to me from one of the islands on the coast of Scotland. The family from which he was derived was healthy and strong; but when two of his sisters were young, the herd of cattle became affected with tuberculosis. These girls were fed upon the milk of these cattle. The two brothers, who were more fond of whiskey than milk, are still hale and healthy—the sisters are lying in their graves, victims to tuberculosis."

Dr. Frank S. Billings of the University of Nebraska, one of our best pathological specialists, says, "This question of the specific infection of milk from tuberculous cows is no trifling matter: on the contrary, *it is one of life and death*. How many thousand babies are yearly brought up on the bottle with cow's milk? All the fond parents ask is, *that the milk is from one cow*. This guaranteed, they appear to feel perfectly satisfied. No one seems yet to have thought that a trustworthy and expert guarantee of the hygienic condition of the cow giving the milk was necessary. We make great demands, and get terribly excited about the purity of our water supply. We spend millions of dollars to keep the fountains pure and to prevent all foreign admixtures on its passage to us. Is it not as much our duty to examine into the purity of the fountains from which comes our milk supply? We

cannot but repeat our assertion that every State board of health should be liberally supplied with funds to be used exclusively for experimental purposes, and in every State there should be a station for such purposes." These cases should be more than sufficient to call the attention of every reflecting man and woman to the fact that tuberculosis is not only a disease, the disposition to which is transmissible from parent to offspring, both human and animal, but that it is, under certain circumstances, a highly contagious and infectious disease. They tell us in warning words that we must not only be most careful in selecting our partner for life, but in the selection of a nurse for children, and, when necessary, the cow from which we are to give them milk. Our own State board of health says: "Feeding experiments have conclusively shown that tuberculosis may be transmitted by means of the milk and flesh of diseased animals. Therefore prevention has to regard both the danger to other animals and to man. The milk from cows with this disease, even in its earliest stages, or when suspected, should never be used for human food. The flesh should never be used unless the disease is in its earliest stages and is so localized that the tubercular growth can be entirely removed."

Fleming says "The circumstances which may preserve mankind from the harmful action of the milk, are, happily, more easy to realize than those which should completely guarantee us from the danger likely to be incurred from consuming the flesh of tuberculous animals. It is, nevertheless, true that we do not know the special character which would allow us to distinguish, either by the naked eye, or by the aid of chemical or ordinary physical analysis, healthy from infected milk, while, on the other hand, obligatory search for the tubercle bacillus in all milk would be an excessive and impracticable measure. To prohibit the sale of milk of cows presenting symptoms of tubercular phthisis would be without result, the milk not being subjected to sufficient control, so far as its origin is concerned. The recommendation not to use the milk

until it has been boiled has more likelihood of being observed, and is more certain of success than that relative to cooking the flesh. Milk is a fluid which heats uniformly, so that we may admit that in boiled milk every specific principle of tuberculosis, as well as the virus, is destroyed. In addition, the milk from different animals is usually mixed, so that the activity of the virus in virulent milk is in this way attenuated by its commingling with healthy milk. This attenuation may be so great that the mixture is altogether inoffensive. Lastly, it should be recognized that the milk of every tuberculous cow is not fatally charged with the contagious principle of tuberculosis; although we cannot deny that the milk of such cattle should be very infective, if the disease is localized in the udder, (mammary glands). Degive, professor at the Brussels Veterinary School, relates the case of a cow which had the localizations of tuberculosis in the mamma. "A brown cow, of a delicate constitution, but a good milker, was attacked by a violent inflammation of the left half of the udder, which resisted every kind of treatment. The udder increased in size, and the secretion of milk was completely suspended. In a few weeks the cow commenced to cough and to breathe with difficulty—phenomena which were soon complicated with manifestations of fever. The diagnosis was pulmonary inflammation. The animal was killed, and on examination of its body there were found tuberculous nodosities on the pleura, as well as in the udder, where they were in great number." These symptoms conform precisely with those exhibited in the case of "Helen Hart," (No. 5 P. M.), and she is the dam of two of the bulls sold from the College farm. It results from the observations collected up to the present time, and from a consideration of the natural condition of things, that the dairies which supply milk warm from the cow, intended to be given directly to children, offer the greatest danger to the public health. In these establishments they do not rear the cows they employ, but buy them, always endeavoring to obtain those which yield the most milk, and these they milk excessively. In regard to the use of the

meat, Zundle is of the opinion that, so far as injury or danger from the use of such flesh is concerned, up to the present time only theoretical considerations, based on imperfect experiments which are opposed to the facts derived from close observation, have been invoked. The discovery of Koch, he adds, shows that the parasite of tuberculosis is only met with in the pathological productions characteristic of this malady, and are not diffused, like certain other of the infectious diseases, throughout the whole of the juices of the body, nor yet of the blood; and it is for these reasons that the bacilli are not found in the flesh. As a result, says this learned principal veterinary surgeon of Alsace Lorraine, it follows that the practice hitherto pursued should be in no way modified, and that, as in the past, only the flesh of wasted and wholly infected animals should be interdicted for food; the utilization of that which is derived from cattle less diseased may be allowed, if it be recommended to consume it only after it has been well cooked. Some Shorthorn steers, slaughtered at Orono, which had been kept for experimental feeding, were as "handsome and wholesome" as any Chicago or eastern beef, and I regarded it as a sacrifice of just so much marketable product, when they were put into the trench and destroyed. These steers had gained a pound and a half a day, from the time they were calves, and the lesions in them were very slight, mostly confined to the maxillary and lymphatic glands.

"POST MORTEM" NOTES OF COLLEGE HERD.

*Pansey*, I. (No. 1.)

Cyst in centre of left lung. Apex affected, right filled with miliary tubercles. Age 8 years. Bred in Bowdoin. Dam, Model. Produce, Mildred, (No. 2, P. M.), Hyacinthe, (No. 3), and a bull calf that was affected and coughed when but three days old.

*Mildred*, I. (No. 2.)

Adhesions of both lungs to costal pleura, badly affected. Age 5 years. Bred in Bowdoin. Dam, Pansey, (No. 1).

Produce, "Mildretta of Orono," (No. 4) and *bull* sold, now coming 3 years old, both bred on College farm.

*Hyacinthe, I.* (No. 3.)

Both lungs affected. Tubercles in right. Age 4 years. Bred in Bowdoin. Dam, Pansey, (No. 1). Produce, "Gray Nose," (No. 47).

*Mildretta of Orono,* (No. 4.)

Affected with tubercles. Age 1 year. Dam, Mildred, (No. 2). Bred on College farm.

"*Helen Hart.*" (No. 5.)

Both lungs and mammary glands affected, so that her milk was tainted. Age 8 years. Bred on College farm. Dam, "Hepsy Hart." Grand dam, Hebe. Produce, heifer calf, (No. 6), and two bulls, coming 3 and 4 years old, both bred on College farm.

*Helen's Calf.* (No. 6.)

Affected with miliary deposits in both lungs. Age 8 months. Dam, "Helen Hart," (No. 5). Bred on College farm.

"*Hesta Hart of Orono.*" (No. 7.)

Affected with tubercles and cough. Age 1 year. Dam, "Hesta Hart." Grand dam, "Hebe." Bred on College farm. "Hesta Hart" died ingiving birth to "Hesta Hart of Orono."

"*Hugo Pauline.*" (No. 8.)

Affected with tubercle in right lung size of hen's egg. Age 7 years. Bred on College farm. Dam, "Pride of Lachine," Grand dam, Hebe. "Hugo Pauline" was sold from the herd when one week old, passed through several hands, and was re-purchased by Mr. Gowell in January, 1885.

*Collie, I.* (No. 9.)

Right lung affected with tubercles. Age 9 years. Bred in Winthrop. Produce, Tinney, (No. 10), and Collie, 2nd, (No. 13).

*Tinney, I.* (No. 10.)

Both lungs affected with tubercles. Age 7 years. Bred in Winthrop. Dam, Collie, (No. 9). Produce, Eizeletta (No. 11), Tinetta, (No. 14), Tinney's calf, (No. 15) and bull sold now coming 3 years old.

*Eizeletta, I.* (No. 11.)

Tubercle (size of hen's egg) in right lung. Left lung affected. Age 5 years. Bred in Winthrop. Dam, Tinney, (No. 10). Produce, Blanche (No. 12) and "bull calf" (No. 16½.)

*Blanch.* (No. 12.)

Both lungs badly affected. "Grapes" (angle-berries) and abscess in right lung. Age 3 years. Bred on College farm. Dam, Eizeletta, (No. 11.) Produce, (No. 16) bull calf, affected, coughed badly and debilitated.

*"Collie, 2nd."* (No. 13.)

Thyroid and maxillary glands affected. Age 2 years. Bred on College farm. Dam, Collie, (No. 9). No produce.

*Tinetta.* (No. 14.)

Glands affected. Coughed. Age 1 year. Bred on College farm. Dam, Tinney, (No. 10).

*"Tinney's Calf."* (No. 15.)

Parotid Glands affected, coughed badly and emaciated. Age 3 months. Bred on College farm. Dam, Tinney, (No. 10.)

*"Blanch's Calf."* (No. 16.)

Glands affected, stiff neck. Age 9 months. Dam, Blanch, (No. 12). Bred on College farm.

*"Eizeletta's Calf."* (No. 16½.)

Coughed badly. Age 10 months. Dam, Eizeletta (No. 11). Bred on College farm.

*Highland Belle, 2nd.* (No. 17.)

Badly affected in both lungs and liver. Age 6 years. Bred at Bowdoinham. Purchased in 1882. Produce, Edith, (No. 18) and bull, sold, now coming 3 years old. Bred on the farm.

*Edith.* (No. 18.)

Both lungs badly affected, and pleural adhesions to ribs. Age 3 years. Dam, Highland Belle, 2nd, (No. 17). Bred on College farm.

*"Belle of West Meadows."* I. (No. 19.)

Affected with tubercles in both lungs. Age 11 years. Imported in her dam from the Isle of Jersey. Produce, "Maid of West Meadows," (No. 20), and one bull, sold. Bred on College farm.

*"Maid of West Meadows."* I. (No. 20.)

Affected with tubercles. Age 4 years. Bred in Rockland. Dam, "Belle of West Meadows," (No. 19). Produce, Flossy, (No. 22).

*"Belle of West Meadows' Calf,"* (No. 21.)

Glands affected. Coughed badly. Age 8 months. Dam, "Belle of West Meadows," (No. 19.) Bred on the farm.

*Flossy.* (No. 22.)

Lame in left shoulder. Right lung greatly affected with large abscess, left lung and bronchial glands also much affected. Age 2 years. Bred on College farm. Dam, "Maid of West Meadows," (No. 20). No produce.

*Tulip 4th.* I. (No. 23.)

Large tubercle in right lung, both affected. Age 8 years. Bred at Oldtown. Produce, Tulip's heifer calf, (No. 24), Berry, (No. 39), and one bull, sold, now coming 4 years old. Bred on College farm.

*Tulip's Calf.* (No. 24.)

Glands affected, with cough. Age 4 months. Dam, Tulip 4th, (No. 23). Bred on College farm.

*Thresa.* (No. 25.)

Tubercular deposits in both lungs. Age 3 years. Bred on College farm. Dam, Rose 8th, (No. 48). Produce, heifer calf, (No. 26). Rose 8th was killed in 1885.

*"Thresa's Calf."* (No. 26.)

Miliary deposit in both lungs. Age 5 months. Dam, Thresa, (No. 25). Bred on the College farm.

*“Princess Alba.”* I. (No. 27.)

Lungs loaded with deposit, angle-berries, large abscess and cavities, with bronchial glands greatly enlarged. Age 8 years. Purchased in Rockland. Produce, Jersey Lilly (No. 28), Crummie, (No. 29), and the Kent Bull.

*“Jersey Lilly.”* I. (No. 28.)

Stiff neck, emaciated and bad cough. Age 2 years and 9 months. Purchased in Rockland. Dam, “Princess Alba,” (No. 27). Killed by Mr. Gowell in March, 1885.

*Crummie.* (No. 29.)

Adhesions to costal pleura on left side, both lungs affected. Age, about 2 years. Dam, “Princess Alba,” (No. 27). No produce. Bred on College farm.

*Juno 2d.* I. (No. 30.)

Sold to Mrs. Stetson of Bangor. Purchased in Auburn in 1883, when 2 years old. Dam, Effie. Produce, Susie, (No. 31) and two bulls, sold, all bred on College farm.

*Susie.* (No. 31.)

Both lungs affected with miliary deposits. Age 2 years. Dam, Juno 2d, (No. 30). Bred on College farm.

*Julette.* I. (No. 32.)

Both lungs affected with tubercles, also lymphatic glands. Age 7 years. Purchased in Auburn of Briggs & Son. Dam, Pet. Produce, Brownie, (No. 33.)

*Brownie.* (No. 33.)

Stiff neck, glands enlarged, both lungs affected. Age 2 years and 3 months. Dam, Julette, (No. 32). Bred on College farm. Killed by Mr. Gowell, in March, 1885.

*“Gray Nose.”* (No. 34.)

Stiff neck, lungs badly affected, emaciation and cough. Age 2 years and 6 months. Dam, Hyacinthe, (No. 3). No produce. Bred on College farm. Killed by Mr. Gowell, in March, 1885.

*Betsy.* I. (No. 35.)

One of the worst cases of tubercular formations and abscess at Orono, both lungs affected. Bought by Mr. Gowell

in Augusta, in 1883. Killed in January, 1886. Produce, Nan Lizzie, (No. 36).

"*Nan Lizzie.*" (No. 36.)

Right lung badly affected with tubercles and cavities. Age 2 years. Bred on College farm. No produce.

*Clover. I.* (No. 37.)

Both lungs affected with tubercles. Age 14 years. Bred in Brunswick. Produce, Clover's Pet, (No. 38) and Hattie, sold 3 years ago when a calf.

"*Clover's Pet.*" (No. 38.)

Slightly affected in left lung, calcareous deposit in bronchial glands. Age 2 years. Dam, Clover, (No. 37). Bred on College farm. Produce, Clover's Pet's calf, (No. 39).

"*Clover's Pet's Calf.*" (No. 39.)

Tubercles in both lungs, bad cough. Age 8 weeks. Dam, Clover's Pet, (No. 38). Bred on College farm.

*Pet. I.* (No. 40.)

Large tubercles and abscess, both lungs badly affected. Age 14 years. Bred in Bowdoin, and bought by Mr. Gowell in 1882. Produce, Old Pet's calf, (No. 41) and one bull, sold, now coming 4 years old. Killed by Mr. Gowell, Feb. 21st, 1886.

"*Old Pet's Calf.*" (No. 41.)

Lungs affected, bad cough. Age 9 months. Dam, Old Pet, (No. 40). Bred on College farm.

*Juno. I.* (No. 42.)

Large abscess in right lung. Left generally affected. Age 11 years. Purchased in Rockland. No produce.

*Mollie. I.* (No. 43.)

Right lung affected with tubercles of the size of a hen's egg. Age 6 years. Bred in Howland. Purchased in 1885.

*Princess Alice. I.* (No. 44.)

Lungs studded with miliary tubercles, calcification of bronchial lymphatic glands. Age 5½ years. Killed March 11th. Bred in Bowdoin.

*Bess Pet.* I. (No. 45.)

Both lungs affected. 2 years old. Dam, Bess. Bred on College farm.

*Augusta Boy.* I. (No. 46.)

Affected with tubercles in both lungs. Age 4 years. Bred in Augusta, and placed in the herd September, 1885.

*Maggie 3d.* (No. 48.)

Emaciated and coughed badly. Age 12 years. Bred on College farm. Killed by Mr. Gowell in the autumn of 1884.

*Rose 8th.* (No. 48.)

Short-Horn Herd Book cow. Refused to breed, and was sold to a butcher, and her lungs found badly affected. Bred at Stark, and bought with her dam when but a few days old. Killed by Mr. Gowell. Produce, Thresa, (No. 25).

*Berry.* (No. 49.)

Thoroughbred Short-Horn steer. Glands affected. Coughed. Age 2 years. Dam, Tulip 4th, (No. 23). Bred on College farm.

*Bright.* (No. 50.)

Thoroughbred Short-Horn steer. Glands affected, with bad cough. Age 19 months. Purchased when 4 days old.

*Roan Heifer.* (No. 51.)

Glands affected and coughed. Age 3 months. Purchased when three days old at Oldtown.

The dams of eleven of the "bulls sold" from the farm are :

"Helen Hart," No. 5, the dam of two.

Collie, No. 9, the dam of one.

Belle of West Meadows, No. 19, the dam of one.

Mildred, No. 2, the dam of one.

Highland Belle, 2nd, No. 17, the dam of one.

Tulip, 4th, No. 23, the dam of one.

Old Pet, No. 40, the dam of one.

Princess Alba, No. 27, the dam of the "Kent Bull."

Juno, 2nd, No. 30, the dam of two.

The post mortem report I furnish above has been the result of considerable labor to prepare, but I believe it will well repay every one interested, to give it a careful perusal, as bearing directly upon the young bulls that have been sold from the College farm. Take the "Hebe" family as an example: I regard Hebe as a typical case, and the real "Skeleton in the Closet" of the College cases. "Helen Hart," No. 5, is the dam of *two bulls* sold from the farm, now coming 3 and 4 years old. "Helen Hart" was out of Hepsy Hart and she out of Hebe. "Hesta Hart of Orono," No. 7, was out of "Hesta Hart" and she out of Hebe. "Hugo Pauline," No. 8, was out of "Pride of Lachine" and she out of Hebe. "Helen's Calf," No. 6, was out of "Helen Hart," granddam Hebe, and Hebe is the old Jersey cow *that refused to breed*, and which Mr. Rich so'd for \$22, she having cost the State a few years before \$250.00. Reduced to the military tactics of Orono, I should say that "Helen Hart" enlisted at the "beginning of the campaign" in the "infantry service," with Mr. Farrington, in 1877, and was turned over (with other "pensioners") at the close of his command in 1878, into the "hospital department" of Mr. Rich, where, after serving through a "hard siege" of four years, together with a lot of "diseased and disabled veterans," she joined the "new recruits" of Mr. Gowell in 1882. As a member of the "full band" she served all "through the war," and was turned over to the State Commissioners in March, 1886, when she was "mustered out," and soon afterwards died from the "effects of a wound," contracted while in the "service of the State." She left two "sons of veterans" who are, no doubt, still "willing and anxious" *to serve*, but as the "war is over," I have to recommend that they be put on the "retired list" as soon as the "necessary orders" can be given. Try the "Collie" family by the same test, for *Tinney*, No. 10, is the dam of *one of these bulls*, now coming 3 years old. Tinney was out of the old cow Collie, No. 9, Tinetta, No. 14, was out of Tinney, and she out of Collie. Eizeletta, No. 11, was out of Tinney, and she out of Collie. "Tinney's Calf," No. 15, was out of Tinney,

and she out of Collie. Blanch, No. 12, was out of Eizeletta, grandam Tinney. "Blanch's Calf," No. 16, was out of Blanch, great-grandam Tinney. "Eizeletta's Calf," No. 16½, was out of Eizeletta, great grandam Collie, and Collie 2d, No. 13, was also out of Collie. No. 12, No. 13, No. 14, No. 15, No. 16, No. 16½, and the *bull sold*, were all bred upon the College farm. Look over the post mortem notes opposite each member and see how you like them. Blanch (one of the very worst cases at Orono), with her dam Eizeletta, her grandam Tinney, and her great-grandam Collie, stood "side by side." Four generations of "Winthrop Jerseys," all splendid animals as far as appearances went, but whose lungs are a "mass of corruption," as were all their produce, together "with their uncles, their cousins and their aunts." Do you wonder, then, that the "warp and woof" of tubercle was woven into the "bone and muscle" of the entire herd, and that they all came honestly by the disease? Take the case of "*Belle of West Meadows*," No. 19, she is the dam of *one bull sold*, now coming 3 years old. "Maid of West Meadows," No. 20, is out of "Belle of West Meadows," "Flossy," No. 22, is out of "Maid of West Meadows," and she out of No. 19. "Belle of West Meadows' Calf," No. 21, is also out of No. 19, and the whole lot are diseased. *Mildred*, No. 2, is the dam of *one bull sold* now coming 3 years old. Mildred is out of Pansey, No. 1. Hyacinthe, No. 3, is out of Pansey. "Mildretta of Orono," No. 4, is out of Mildred and she out of Pansey. "Gray Nose," No. 34, is out of Hyacinthe, and she out of Pansey. "Highland Belle, 2nd," No. 17, is the dam of *one bull sold*, now coming 3 years old. "Highland Belle, 2nd," is also the dam of Edith, No. 18. Both bred on the College farm. A bad lot. "Tulip, 4th," No. 23, is the dam of *one bull sold*, now coming 4 years old. "Tulip's Calf," No. 24, is out of Tulip, 4th, and Berry, No. 49, is also out of Tulip, 4th, all diseased. *Old Pet*, No. 40, is the dam of *one bull* now coming 4 years old. Old Pet is also the dam of "Pet's Calf," No. 41. Princess Alba, No. 27, is the dam of the Kent Bull. "Jer-

sey Lilly," No. 28, is out of Princess Alba, and Crummie, No. 29, is also out of Princess Alba. The "Kent Bull" is the only one of these animals from which I have yet had the pleasure of seeing the lungs and glands, and these plainly show the primal formation of the tubercular deposit from different centres, while his dam was "rotten to the core." Last but not least is Juno, 2nd; she is the dam of *two bulls solid* from the farm, now coming 2 and 3 years old. Juno, 2nd, also produced Susie, No. 31, all bred on the College farm. Juno, 2nd, was sold from the farm to Mrs. Stetson of Bangor, and although examined by Dr. Michener last April, who failed to discover any unsoundness at that time, I consider her a dangerous animal to be at large. I also failed to discover any unsoundness about the Kent Bull in July, but *four months later* his lungs showed unmistakable lesions of the disease. The above nine cows, excepting Juno, 2nd, were all killed at Orono, and all found thoroughly diseased, and are the dams of *eleven bulls*, all now in service in this State, and it will be noticed that they are each the *dams of from one to four other calves* which we killed at Orono, who were also badly diseased, and still I am told *we have no proof, only a suspicion* that these young bulls (for which the College has received about \$350.00) are *themselves diseased*. In the above statement, I have had nothing to say, recollect, about the *sires of the above bulls*, that would surely contribute to, and intensify the hereditary taint. In the male, tubercle is also deposited in the generative organs; in the structure of the testicle, producing (orchitis). In the tunica vaginalis, producing dropsy (Hydrocele) and, in the structure the cord, producing schirrus. What say you, farmers of Maine, do you wish to patronize these bulls, or have them come in contact with your "Flocks and Herds," or do you think the State of Maine can afford to issue *that kind of stock*, and then *refuse to redeem their depreciated and worthless coupons?* Although it has been my constant endeavor to keep this report within the strictest limits conformable with what the importance of the subject demands, yet as I approach the close of a docu-

ment that may appear lengthy and tedious to many readers, I feel that I should fall far short of my duty to others, were I to refuse to comment upon the cause of an apparent delay in pronouncing the "College Cases" fully and safely disposed of, which results from the first and only "difference of opinion" with any of my associates, in an experience of five years of earnest and successful labor, to free our State from such contagious diseases, as very fortunately for us, have been "few and far between." On July 27th, 1886, I received a legal notice from Mr. G. W. McAlister, one of the municipal officers of Bucksport, to take immediate and official action in reference to one bull purchased in the fall of 1885, by Seth N. Kent, from the herd of the State College at Orono. I went at once to Bucksport and found a yearling bull; while he was apparently well, I advised his being kept apart from other animals, and on no account to be used either for public or private service. As the advice conflicted with that previously given by another member of our Board, I interested myself at once, to have the matter reconciled and disposed of. I wrote to Mr. Gowell on August 7th, to know what cow was the dam of Mr. Kent's bull, and on August 8th, received his reply that "the animal was out of Princess Alba, No. 27, whose lungs and glands were badly affected, she was one of the worst cases at Orono." On August 25th, I again wrote Mr. Gowell, asking him how many bulls had been sold from the College herd, since he had been Superintendent, whose dams we killed, and were known to be diseased. On August 28th I received the following reply: "Dear Sir: The calf was sold to Mr. Kent last September. It was about four months old at that time. Price paid, \$20. Within the last four years *fourteen bulls* and bull calves have been sold from the farm. Eleven of them were bred from cows that we killed. The dams of two others could be regarded with suspicion, as they were taken from the herd because of 'refusal to breed,' and unknown trouble, although examined by Dr. Wilde, post mortem. These bulls were sold for something like \$350. Many of them being but a few days old, explains the low price,

together with the desire to benefit the farmers by selling low ; 'farmers' prices' our motto. Ten of these bulls were sold previous to 1885—nearly two years ago—and must have been used a great deal already ; those sold in 1885 probably have been used limitedly. The Kent bull is the last one that went out." On October 13th at the request of Mr. Kent, I brought the case before the Governor and Council at Augusta, and also wrote to Dr. Michener, reporting the case, and asking for his opinion. August 19th, I received his letter, dated New York, '86, saying, "Your letter of the 14th is received. I do not see how any one can advise the keeping of said bull for service. It must be remembered that tuberculosis is held to be hereditary, by all the best authorities, both human and veterinary. If this be true, and I believe it to be so unquestionably—then this particular animal is certainly an unsafe sire—or to put it differently, is a sire almost *certain* to propagate the disease. *He should be killed.*" On October 22nd, I received a proposition from Mr. McAlister, who from the first had taken much interest in the matter, saying, "If the State will give \$25 the bull shall be disposed of and I will pay the rest of the bill myself. I make this proposition that the future of this community may be safe." This proposition was rejected, and finally, through the united efforts of Mr. McAlister and myself, the bull was killed about November 1st, and the lungs and glands sent to me for examination. I retained a portion and sent the anterior lobe of the right lung to the American Veterinary College of New York. The following is a copy of a letter from Dr. Michener, dated New York, November 19th, 1886 :

MY DEAR DOCTOR :—Your letter received. I am glad you wrote me concerning this, as it gives me an opportunity to say that by chance I saw a portion of the lung sent to American Veterinary College from the "Kent Bull," (Dr. Liantard told me) a calf of one of the cows of Orono herd. These lungs show *unmistakable lesions of Tuberculosis*. Why don't you hunt up all such bulls and have them destroyed? There can be but little doubt that they will all sooner or later develop this disease. They will serve to extend it in many herds where their services are required. The Commissioners, and the State Veterinarian more than all—

will be I think directly responsible for every case of such extension. In the eyes of all veterinarians you will deserve censure if you fail to follow up each animal. They may be yet used for beef. Probably your hands are tied. I think this the case, for I know you well enough to judge that you are not one to avoid a duty, no matter how unpleasant.

(Sd) CH. B. MICHENER, D. V. S.,

Chief Inspector of Bureau of Animal Industry,  
U. S. Dep't of Agriculture."

These are no "idle words," they are the matured judgment and opinions of a man who is a leader, and a teacher in that humane profession to which I have the honor to belong, and I have been thus particular to offer the correspondence in this case, for the reason that the "Kent Bull" is the only one described by Mr. Gowell in his letter of August 28th, that I have yet seen, or of which I have any knowledge of their present whereabouts, but as the proper disposal of all the others pivots on this one case, the position I take can now be fully understood, which is, that *no one of these outcasts should be allowed to cohabit with other animals, or to propagate their kind*, and that every one of the vagabonds, should be *promptly inspected and destroyed*, either for beef or otherwise as circumstances shall develop. It was Shakespeare who said "Diseases desperate grown by desperate appliances are relieved, or not at all." What these animals have inherited they can surely transmit, and by a decree as unchangeable as the law of the Medes and Persians, which altereth not, "the iniquities of the fathers shall be visited upon the children unto the third and fourth generations." In conversation recently with Governor Bodwell, he said that he "considered that the animals sold out of the Orono herd, to go into other herds, should have been looked after long ago, and that proper measures are necessary to prevent further spread of the disease." I am told by others who differ with me, as to the proper disposal of the outstanding cases at Orono, first, that the law gives the Commissioners no *police powers whatever*, that only *on appearance of disease*, which the municipal authorities fear endangers public interests, they

are to call upon us. According to this, no matter how much personal knowledge the Commissioners may have of the presence of any contagious disease, the law says "Hands off" until some owner who does not recognize the disease, has notified some town officer who does know the law, that he *suspects* contagion. "To be forewarned is to be forearmed," and if this be true, the sooner the Commissioners are "clothed with power" to act promptly, and to dispense with "red tape" while contagion is being sown broadcast all over our State, the better it will be for the community. The first essential in any attempt to control contagious diseases is the power to enter upon premises and inspect the stock wherever it may be. Without such power the existence of contagious diseases cannot be determined. Owners frequently have no means of determining the nature of a malady from which their animals may be suffering, and oftener still they may be satisfied as to the character of their affliction, but prefer that others should be kept in ignorance of it. With either breeding herds or milk dairies the business of the owner is generally destroyed as soon as the public learns that the animals are affected, and consequently, the endeavor to keep the public in ignorance of it is an effort for self-preservation. The second objection to the issuing of summary orders in these cases is "that we have no *proof* (only a suspicion) *that these College bulls are diseased.*" If the facts that I have collected, presented and grouped "around and about" every one of these animals is not deemed a good and sufficient answer to the latter allegation, then I am ready to believe that there is no absurdity so great but that it will find some champion to defend it.

GEO. H. BAILEY, D. V. S., PORTLAND, ME.,  
 Secretary and Veterinary Surgeon of Board of Commissioners  
 on Contagious Diseases for Maine.

Having been put in possession of all the above facts, we hereby fully concur in the above report.

W. B. FERGUSON, } Commissioners for Maine on  
SAMUEL BELL, } Contagious Diseases of Animals.

CH. B. MICHENER, D. V. S.,  
Professor of Obstetrics, Cattle Pathology, Materia Medica,  
Therapeutics and Hygiene, American Veterinary College  
of New York.

FREDERICK HENRY GERRISH, M. D.,  
President Maine State Board of Health.

A. G. YOUNG, M. D.,  
Secretary State Board of Health.

PORTLAND, Sept. 1st, 1886.

## STATE OF MAINE.

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IN SENATE, February 2, 1887.

On motion by Mr. HEATH, referred to Committee on Agriculture, and they authorized to have the same printed.

CHARLES W. TILDEN, *Secretary*.