Public Documents of Maine:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

Public Officers and Institutions

FOR THE YEAR

1897.

VOLUME II.

AUGUSTA
KENNEBEC JOURNAL PRINT
1897

REPORT OF COMMISSIONERS

ON

CONTAGIOUS DISEASES

OF

ANIMALS

Under the Law of 1887, Chapter 138, of Public Laws of Maine

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AUGUSTA
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REPORT.

To His Excellency, the Governor of Maine:

We present our bi-annual report of the year closing December 31, 1896, together with an account of our appraisals of horses and cattle destroyed under provisions of the law of 1887, chapter 177, relating to contagious diseases in this State, and as amended in 1892, chapter 194:

The first inspection of the year was ordered at Hartland, where on January 1st, a milch cow was condemned and destroyed. Appraisal, $50.

January 3rd. Herd of cattle inspected at Gorham, but no contagious disease found.

January 4th, East Otisfield. A case of tuberculosis was discovered in a grade Holstein cow. Appraisal, $50.

January 9th, Brunswick. Inspection of cattle, but no contagious disease discovered.

January 10th, Orrington. Inspection of herd of cattle, but no disease found to exist.

January 11th, Livermore Falls. Inspection of herd of cattle was made and tuberculin test ordered.

January 12th, Bangor. A case of glanders was reported, but none was discovered.

January 14th, West Buxton. A case of tuberculosis was reported, but none discovered.

January 15th, Waterboro. A case of tuberculosis was reported which proved to be emphysema.

January 16th, Hermon. A case of tuberculosis was reported, but none was found.

January 17th, Farmington. Inspection of herd of cattle, and bull found diseased. Appraisal, $25.

January 18th, East Otisfield. A case of tuberculosis was reported, but no case was found.

January 22d, West Ripley. Herd of cattle inspected and an ox found badly diseased. Appraisal, $50.

January 24th, West Auburn. A case of glanders was reported, but none discovered.

January 25th, Windham. Herd of cattle inspected and grade Jersey cow found diseased. Appraisal, $25.

January 27th, Winslow. Inspection ordered of herd of milch cows, but no disease discovered.

January 28th, Fryeburg. Inspection of herd of cattle, but no disease discovered.

January 29th, Canton Point. Inspection of herd of cattle ordered, and Jersey heifer condemned. Appraisal, $20.

January 29th, Belfast. Inspection of herd of cattle ordered, but no contagious disease found.

January 29th, Bangor. A case of tuberculosis was reported, but none discovered.

January 30th, Eliot. A case of tuberculosis was reported, but none discovered.

January 31st, New Gloucester. Herd of cattle was inspected and Jersey cow condemned. Appraisal, $30.

January 31st. Inspection of cattle was ordered at Bridgton and tuberculin tests ordered.

February 1st. Inspection of herd at Norway disclosed two cows affected with tuberculosis. Appraisal, $75.

February 4th. Inspection of cattle at Bridgton disclosed fifteen cows, one bull and six calves affected with tuberculosis. Appraisal, $780.

February 5th, East Otisfield. A grade cow was found affected and condemned. Appraisal, $50.

February 6th, Troy. An old cow was found diseased and condemned at an appraisal of $13.

February 7th, West Falmouth. Inspection of cattle was ordered, but no contagious disease found.

February 8th, Farmington. A herd of cattle was examined, but no disease found.

February 9th, East Dixfield. A case of tuberculosis was found in a grade cow. Appraisal, $50.

February 13th, Readfield. A case of tuberculosis was reported, which proved to be emphysema.

February 14th, Minot. A case of tuberculosis was found in a grade cow. Appraisal, $40.

February 15th, Solon. A case of tuberculosis was discovered in an ox. Appraisal, $50.

February 15th, Fairfield. A case of glanders was reported but none discovered.

February 17th, Gorham. A herd of cattle was inspected and a grade cow found diseased. Appraisal, $20.

February 18th, Lewiston. A herd of cattle was inspected, but no contagious disease discovered.

February 19th, Ellsworth. A case of tuberculosis was reported, but none found.

February 19th, South Sanford. A herd of cattle was inspected and an ox found with chronic pneumonia.

February 20th, Fairfield Centre. A herd of cattle was inspected, but no disease discovered.

February 20th, North Bangor. A case of glanders was reported, but none discovered.

February 22d, East Lebanon. A cow was found affected with tuberculosis and condemned. Appraisal, $30.

February 23rd, Monroe. A case of tuberculosis was reported, but none discovered.

February 24th, Carmel. A case of tuberculosis was reported, but none discovered.

February 25th, Norway Lake. A herd of cattle was inspected and two grade cows condemned. Appraisal, $100.

February 25th, Norway. A cow was reported diseased, but no contagious disease found.

February 25th, Carmel. A case of tuberculosis was reported, but none discovered.

February 26th, Livermore Falls. A herd of cattle was inspected, and a thoroughbred Jersey bull found affected with tuberculosis. Appraisal, $50.

February 27th, Hampden. A case of tuberculosis was reported, but none discovered.

February 29th, Readfield. A herd of cattle was inspected, but no contagious disease found.

March 5th, Fayette. A herd of cattle was inspected, but no contagious disease discovered.

March 6th, Canton. A herd of Jerseys was inspected and tuberculin tests ordered.

March 10th, Oxford. A cow was found affected with tuberculosis and killed with no appraisal.

March 11th, Gray. A cow was found affected with tuberculosis Appraisal, $30.

March 12th, Readfield. A case of tuberculosis was reported, but none discovered.

March 13th, Bridgton. A herd of cattle was inspected, but no new cases discovered.

March 14th, East North Yarmouth. A case of glanders was reported, but proved to be catarrh.

March 15th, Oldtown. A horse was found affected with glanders. Appraisal, $50.

March 17th, Deering. A herd of Milch cows was inspected, but no disease discovered.

March 18th, Kennebunk. A herd of cattle was inspected, but no disease discovered.

March 19th, Kittery. A herd of cattle was inspected, but no contagious disease found.

March 19th, Bridgton. A herd of milch cows was examined and two Jersey cows found diseased. Appraisal, $100.

March 21th, Long Creek. A herd of milch cows was inspected, but no disease discovered.

March 22nd, Deering. A herd of cows was inspected, but none found diseased.

March 24th, Belfast. A flock of sheep and cattle was inspected and quarantined.

March 25th, Eliot. A herd of cattle was inspected and quarantined.

March 26th, Deering. A Western horse was found affected with farcy. Appraisal, $50.

March 26th, Peru. Cattle were inspected, but none found diseased.

March 27th, Otisfield. A grade cow was found affected with tuberculosis. Appraisal, $30.

March 28th, Portland. A bad case of farcy was discovered and condemned. Appraisal, $50.

April 2d, Unity. Contagious disease was reported in herd of cattle, but none discovered.

April 3d, Yarmouthville. A herd of cattle was inspected, but no disease discovered.

April 6th, Deering. A case of tuberculosis was reported, but none found to exist.

April 7th, Buxton. A herd of cattle was inspected, but no disease discovered.

April 7th, Topsham. A case of tuberculosis was reported which proved to be pneumonia.

April 8th, South Portland. State Reform School herd was tested with tuberculin and one case found affected with tuberculosis. No appraisal.

April 11th, Hebron. A flock of sheep was inspected, and found affected with a parasitic disease, known as esophagostoma columbianum.

April 14th, Saco. A case of tuberculosis was reported in a grade cow and condemned. Appraisal, $30.

April 15th, Thorndike. A cow was discovered affected with tuberculosis and appraised, $25.

April 16th. Standish. A case of tuberculosis was discovered in an ox. Appraisal, $50.

April 17th, East Raymond. A case of glanders was reported, but proved to be catarrh.

April 18th, Gray. A case of tuberculosis was reported which proved to be emphysema.

April 18th, Saco. A case of tuberculosis was discovered in a grade Jersey cow. Appraisal, $20.

April 20th, Pleasantdale. A case of glanders was discovered and destroyed. Appraisal, $50.

April 21st, Portland. A case of farcy was discovered and condemned. Appraisal, $50.

April 22d, Saco. A case of glanders was reported which proved to be catarrh.

April 22d, North Carmel. A herd of cattle was inspected, but no disease found.

April 23d, Weston's Mills. A case of tuberculosis was discovered in a grade cow. Appraisal, $44.

April 24th, Bucksport. Tuberculosis was reported in a Jersey cow and found diseased. Appraisal, $40.

April 25th, Portland. A case of glanders was reported, which proved to be catarrh.

April 25st, Cumberland Mills. A herd of cattle was inspected, but no disease found.

April 27th, Leeds Center. A case of tuberculosis was discovered in an old Jersey cow. Appraisal, $20.

April 28th, Farmington. A case of tuberculosis was found in a cow recently from Massachusetts, and condemned with no appraisal.

May 1st, South Portland. A case of glanders was discovered in a Western horse. Appraisal, $50.

May 2d, Orland. A case of tuberculosis was reported in a grade cow, but no case found.

May 4th, Kennebunkport. An ox was reported to have tuberculosis, but no case discovered.

May 6th, Sweden. A herd of cattle was inspected and quarantine ordered.

May 9th, Livermore. A herd of cattle was inspected and four calves found dead, affected with anthrax. Appraisal, $40.

May 9th, Troy. A case of tuberculosis was reported, but none discovered.

May 10th, Hermon. A case of tuberculosis was reported, but none discovered.

May 11th, Kittery. Herd of cattle inspected and two cows condemned. Appraisal, $95.

May 12th, Carmel. A case of tuberculosis was reported, but none discovered.

May 13th, Deering. A case of glanders was discovered in a Western horse. Appraisal, $50.

May 13th, Winterport. A case of tuberculosis was discovered in a grade cow. Appraisal, $35.

May 14th, Sweden. Herd of cattle inspected and three cows condemned. Appraisal, $100.

May 15th, South China. A herd of cattle was inspected, but no contagious disease found.

May 15th, Norway. A case of tuberculosis was discovered and condemned. Appraisal, $30.

May 16th, Skowhegan. Glanders was reported in a livery stable, and two horses found affected and condemned. Appraisal, $100.

May 16th, Mattawamkeag. A case of tuberculosis was reported, but none discovered.

May 18th, Kittery. Two herds of cattle were inspected, and five milch cows found diseased, and were appraised, $195.

May 2th, Camden. A case of glanders was reported which proved to be catarrh.

May 22d, Augusta. A case of glanders was discovered and destroyed. Appraisal, $50.

May 22d, Scarboro. A case of tuberculosis was reported, but no case discovered.

May 23d, Skowhegan. A case of glanders was discovered and destroyed. Appraisal, $50.

May 23d, North Newburg. A case of tuberculosis was discovered and condemned. Appraisal, $30.

May 24th, East Poland. A case of tuberculosis was discovered and condemned. Appraisal, $30.

May 25th, Clinton. A case of tuberculosis was reported, but none discovered.

May 28th, West Hampden. A case of tuberculosis was reported, but none discovered.

May 29th, Canton. A herd of cattle were inspected and two thoroughbred Jersey cows found affected and condemned. Appraisal, $150.

June 1st, Berwick. Two cases of glanders were reported, and stable ordered quarantined.

June 1st, Danville. Herd of cattle inspected and Holstein bull condemned. Appraisal, $40.

June 2d, Bangor. A case of tuberculosis was discovered and condemned. Appraisal, $30.

June 3d, Cape Elizabeth. A case of glanders was discovered in a Western horse. Appraisal, $50.

June 3d, Bangor. A case of glanders was discovered and destroyed. Appraisal, $50.

June 4th, Portland. A case of glanders was reported, but none discovered.

June 5th, Lewiston. Glanders was reported in a stable, and two horses condemned. Appraisal, $100.

June 6th, Norway. Inspection of a herd of milch cows disclosed no contagious disease.

June 6th, Dedham. A case of tuberculosis was discovered and condemned. Appraisal, $30.

June 7th, North Bradford. A case of tuberculosis was discovered and condemned. Appraisal, $40.

June 8th, Old Orchard. A herd of cattle was inspected and quarantine ordered.

June 9th, Portland. A case of glanders was reported, but none discovered.

June 10th, Lewiston. A case of farcy was reported and condemned. Appraisal, $50.

June 10th, Bangor. A case of tuberculosis was reported, but no case was found.

June 11th, Pea Cove. A case of tuberculosis was discovered in a grade cow. Appraisal, $42.

June 11th, Old Orchard. Inspection of cattle was ordered in two herds, but no disease found.

June 12th, Canton. A thoroughbred Jersey cow was found affected in a large herd. Appraisal, $100.

June 13th, Norway. A herd of milch cows was inspected and three found diseased. Appraisal, $140.

June 14th, Monmouth. A herd of cattle was examined, but no contagious disease found.

June 15th, Farmington. A case of tuberculosis was reported, but none discovered.

June 15th, West Bangor. A case of tuberculosis was reported, but none discovered.

June 16th, Frankfort. A case of tuberculosis was reported, but none discovered.

June 16th, Kittery. A herd of milch cows was inspected and three cows destroyed. Appraisal, $150.

June 17th, Berwick. Two cases of glanders were discovered and destroyed. Appraisal, $95.

June 18th, Lewiston. A case of glanders was discovered and destroyed. Appraisal, $50.

June 19th, Unity. A herd of cattle was inspected, but no disease found.

June 19th, Madison. A case of glanders was reported and horse quarantined.

June 20th, Goodwin's Mills. A case of tuberculosis was discovered and condemned. Appraisal, $14.

June 22d, Portland. A case of farcy was discovered and destroyed. Appraisal, $50.

June 22d, Fryeburg. Inspection of two car loads of cattle; discovered no disease.

June 23d, Danforth Cove. A case of glanders was reported, but none discovered.

June 23d, Bangor. A case of glanders was reported, but none discovered.

June 24th, Cape Elizabeth. A case of glanders was reported, but none discovered.

June 27th, Lewiston. Two cases of glanders were discovered and destroyed. Appraisal, $100.

June 28th, Old Town. A case of glanders was reported, but none discovered.

June 29th, Eliot. A case of tuberculosis was discovered and destroyed. Appraisal, $50.

July 2d, Saco. A case of tuberculosis was discovered and destroyed. Appraisal, $40.

July 3d, Old Orchard. A case of tuberculosis was discovered and destroyed. Appraisal, $50.

July 3d, Skowhegan. A case of glanders was discovered and condemned. Appraisal, $40.

July 4th, Old Orchard. A herd of cattle was inspected and eight cows, one bull, and two calves were found diseased and destroyed. Appraisal, $345.

July 4th, Norway. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

July 5th, Dixmont. A case of tuberculosis was reported, but none discovered.

July 5th, Gorham. A case of tuberculosis was reported, which proved to be emphysema.

July 6th, Bridgton. A case of tuberculosis was discovered and destroyed. Appraisal, $45.

July 7th, South Auburn. A case of tuberculosis was discovered and destroyed. Appraisal, $25.

July 8th, Kennebunk. A herd of cattle was inspected, but no contagious disease found.

July 9th, Waterboro. A herd of cattle was inspected, but no contagious disease found.

July 10th, Old Orchard. A herd of cattle was inspected, but no disease found to exist.

July 11th. East Vassalboro. A herd of milch cows were inspected, but none found diseased.

July 13th, Athens. A herd of cattle was inspected, but no contagious disease found.

July 13th, Saco. A case of tuberculosis was discovered and destroyed. Appraisal, $40.

July 14th, Saco. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

July 15th, Kingfield. A herd of cattle was inspected, but no contagious disease discovered.

July 15th, Cash Corner. A case of glanders was discovered and condemned. Appraisal, $25.

July 16th, Monmouth. A case of glanders was discovered and condemned. Appraisal, $35.

July 17th, Saco. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

July 17th, Hartland. A case of glanders was reported but proved to be catarrh.

July 18th, Old Orchard. A case of tuberculosis was discovered and destroyed. Appraisal, $40.

July 19th, Passadumkeag. A case of tuberculosis was reported, but none found.

July 19th, Danville. A case of tuberculosis was discovered and condemned. Appraisal, $25.

July 20th, Newfield. A case of tuberculosis was reported, but no case discovered.

July 20th, Turner Centre. A herd of cattle was inspected, but no disease discovered.

July 21st, Knightville. A case of farcy was reported, but none found on testing to exist.

July 21st, Eliot. A case of tuberculosis was discovered and destroyed. Appraisal, $50.

July 22d, South Portland. A herd of cattle was inspected but none found diseased.

July 23d, South Paris. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

July 24th, Yarmouth. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

July 24th, South Portland. A case of tuberculosis was discovered and destroyed. Appraisal, $40.

July 25th, Anson. A case of glanders was reported, but proved to be chronic catarrh.

July 26th, East Poland. A case of tuberculosis was reported, but none discovered.

July 27th, Minot Center. A herd of cattle was inspected and quarantine ordered.

July 28th, Cape Elizabeth. A herd of cattle was inspected, but no new cases discovered.

July 29th, Portland. A case of glanders was discovered and condemned. Appraisal, $25.

July 31st, Portland. A case of glanders was discovered and condemned. Appraisal, $50.

August 3d, Bath. A case of glanders was reported, but none discovered.

August 5th, Albion. A herd of cattle was inspected, but no contagious disease found.

August 6th, Greene. A case of tuberculosis was reported, but none found to exist.

August 7th, West Summer. A herd of cattle was inspected, but only a case of emphysema found.

August 8th, South Whitefield. A case of tuberculosis was reported, but none discovered.

August 11th, East Livermore. A herd of cattle was inspected, but no disease found.

August 12th, Manchester. A herd of cattle was inspected, but none found diseased.

August 13th, South Portland. A case of glanders was reported which proved to be catarrh.

August 14th, Otisfield Gore. A case of tuberculosis was discovered and destroyed. Appraisal, $30.

August 16th, Porter. A case of tuberculosis was discovered and destroyed. Appraisal, $35.

August 21st, Falmouth. A case of glanders was reported, but none discovered.

August 24th, Macwahoc, Aroostook county. A herd of cattle was inspected, but no disease found.

September 2d, Albion. A herd of cattle was inspected, but none found diseased.

September 3d, Mason. A herd of cattle was examined, but none found diseased.

September 5th, Readfield. A case of tuberculosis was reported, but none found diseased.

September 7th, Cumberland. A case of tuberculosis was reported, but none found.

September 10th, Winter Harbor. A case of glanders was discovered and destroyed. Appraisal, $50.

September 13th, Holden. A case of tuberculosis was discovered and appraised $25.

September 16th, Portland. A case of farcy was reported, but none discovered.

September 18th, Corinth. A case of glanders was discovered and condemned. Appraisal, $50.

September 19th, Portland. A case of glanders was discovered and condemned. Appraisal, $30.

September 20th, Bangor. A case of tuberculosis was reported, but no case discovered.

September 21st, Saco. A case of glanders was discovered and destroyed. Appraisal, $50.

September 22d, Old Orchard. A case of glanders was discovered and destroyed. Appraisal, $50.

September 23d, Gray. A case of glanders was reported, but proved to be catarrh.

September 23d, Minot. A case of tuberculosis was discovered and condemned. Appraisal, $50.

September 25th, West Woolwich. A case of tuberculosis was reported, but none found.

September 25th, Deering. A case of glanders was reported, but proved to be catarrh.

September 26th, Holden. A case of tuberculosis was reported, but none discovered.

September 26th, Five Islands. A case of glanders was reported, which proved to be catarrh.

September 26th, Foster's Point. A case of tuberculosis was reported, but none found.

September 27th, Dayton. A herd of cattle was inspected, but no contagious disease found.

September 30th, Winthrop. A case of glanders was reported, but none found.

October 1st, Fayette. A case of farcy was discovered and condemned. Appraisal, $50.

October 2d, Fryeburg. A case of tuberculosis was discovered and condemned. Appraisal, $18.

October 3d, Hampden. A case of tuberculosis was discovered and condemned. Appraisal, $30.

October 5th, Thorndike. A herd of cattle was inspected, but no disease discovered.

October 6th, Guilford. A herd of cattle was examined and an ox found diseased. Appraisal, $50.

October 7th, Edgecomb. A case of glanders was reported, but none discovered.

October 8th, East Livermore. A case of glanders was reported, but none discovered.

October 10th, Cash's Corner. A case of glanders was discovered and destroyed. Appraisal, $50.

October 12th, North Saco. A herd of cattle was examined, but no disease found.

October 12th, Cape Elizabeth. A case of glanders was reported, which proved to be catarrh.

October 13th, Portland. A case of farcy was reported, but none discovered.

October 14th, Saco. A case of tuberculosis was reported, but none found.

October 15th, Eddington. A case of glanders was reported, but no case found.

October 15th, North Livermore. A case of farcy was reported, but no case found.

October 16th, Auburn. A herd of cows was inspected and a Jersey cow found affected, and was destroyed. Appraisal, $20.

October 22d, Saco. A herd of cattle was inspected and a grade cow found diseased. Appraisal, $40.

October 24th, Portland. A case of glanders was discovered and destroyed. Appraisal, $50.

October 26th, Durham. A case of tuberculosis was discovered and destroyed. Appraisal, $25.

October 26th, Auburn. A herd of milch cows was inspected and quarantine ordered.

October 27th, West Gray. A case of tuberculosis was reported, but no case found.

October 28th, Farmington. A case of tuberculosis was discovered and condemned. Appraisal, $50.

October 30th, Waldoboro. A case of glanders was reported, but no case found.

October 30th, Robinsons. A case of tuberculosis was reported, but no case found.

October 31st, Skowhegan. A case of glanders was discovered and destroyed. Appraisal, $50.

October 31st, Eliot. A case of tuberculosis was discovered and condemned. Appraisal, $35.

November 2d, South Portland. A case of farcy was discovered and condemned. Appraisal, $50.

November 3d, Willard. A case of glanders was discovered and condemned. Appraisal, $50.

November 5th, Lewiston. A herd of cows was inspected and five found diseased. Appraisal, $137.50.

November 6th, Monmouth. A herd of cows was inspected and five found diseased. Appraisal, $245.

November 7th, Hebron. A cow was found affected with tuberculosis and condemned. Appraisal, $10.

November 9th, Auburn. A cow was found affected with tuberculosis and condemned. Appraisal, $25.

November 10th, Westbrook. A herd of cattle was inspected, but no contagious disease found.

November 11th, Guilford. Inspection was ordered of a herd of cows, but no disease existed.

November 12th, Hampden. A case of tuberculosis was discovered and condemned. Appraisal, $20.

November 12th, Wells. A case of tuberculosis was discovered and condemned. Appraisal, $50.

November 13th, East Lebanon. An ox was found affected with tuberculosis and condemned. Appraisal, $25.

November 13th, Lewiston. A case of tuberculosis was discovered and condemned. Appraisal, $50.

November 14th, Willard. A case of glanders was discovered and condemned. Appraisal, $40.

November 14th, Orono. A herd of cows was inspected, but no disease discovered.

November 15th, Charleston. A case of tuberculosis was discovered and condemned. Appraisal, $30.

November 17th, Portland. Two cases of glanders were discovered and condemned. Appraisal, $100.

November 19th, Portland. A case of glanders was reported, but proved to be chronic catarrh.

November 20th, Lincoln Center. Inspection was ordered in a herd of cattle, but no disease discovered.

November 21st, Portland. A case of glanders was reported, and placed in quarantine.

November 23d, East Dover. A case of tuberculosis was discovered and condemned. Appraisal, $20.

November 27th, Deering. A case of glanders was discovered and condemned. Appraisal, $50.

November 28th, Bangor. Inspection was ordered of a herd of cows, but no disease found.

November 29th, North Turner. A case of tuberculosis was discovered and condemned. Appraisal, $25.

December 1st, New Gloucester. A case of tuberculosis was discovered and condemned. Appraisal, $40.

December 2d, Bangor. A case of tuberculosis was discovered and condemned. Appraisal, $30.

December 3d, Lewiston. A case of tuberculosis was discovered and destroyed, with no appraisal.

December 4th, North Berwick. A case of glanders was discovered and destroyed, Appraisal, $50.

December 4th, West Buxton. A case of tuberculosis was discovered and destroyed. Appraisal, $25.

December 5th, Saco. Inspection was ordered in a herd of cows, but no disease was discovered.

December 7th, Springvale. A case of tuberculosis was discovered and destroyed. Appraisal. $30.

December 7th, Unity. A case of tuberculosis was discovered and destroyed. Appraisal, $30.

December 8th, Richmond. A case of glanders was reported, which proved to be chronic catarrh.

December 9th, Kennebunk. Inspection was ordered of a herd of cattle and one animal quarantined.

December 10th, Mechanic Falls. A case of glanders was reported, but none proved to exist.

December 14th, Minot Center. A herd of cows and young stock, fourteen in number, was all found to be affected, more or less, with tuberculosis and was condemned and ordered destroyed. Appraisal $415.

December 16th, Kennebunk. A case of tuberculosis was discovered and condemned. Appraisal, $50.

December 17th, Winterport. A case of tuberculosis was discovered and destroyed. Appraisal, $30.

December 17th. Saco. Inspection was ordered of a herd of cattle, and two cows and two calves found diseased and were destroyed. Appraisal, $104.00.

December 18th, Portland. A case of glanders was reported, but none discovered.

December 18th, Bangor. A herd of cattle was tested and eleven cows found diseased. Appraisal, $385.

December 19th, Solon. A case of tuberculosis was discovered and destroyed. Appraisal, $25.

December 19th, East Otisfield. Inspection was ordered in a herd of cows, and six condemned and destroyed. Appraisal $210.

December 20th, Dedham. A case of tuberculosis was reported, but none discovered.

December 21st, Westbrook. A herd of cattle was inspected and placed in quarantine.

December 22d, Springvale. A case of tuberculosis was reported, but none discovered.

December 23d, Westbrook. Herd of cattle was tested and continued in quarantine.

December 24th, Portland. A case of glanders was discovered and condemned. Appraisal, $27.

December 24th, Hampden Center. Inspection was ordered in a herd of cows, and fourteen found diseased and were destroyed. Appraisal, $380.

December 28th, Albion. A herd of cows was inspected, but none found diseased.

A summary of the business of the year shows that your commissioners have ordered and attended over three hundred inspections during 1896, scattered all over our State, containing a cattle population of 328,543, and 110,719 horses either bred or owned upon 65,400 farms in Maine. This amount of work is so largely in excess of the demands upon our services of any other year since the present law went into effect, that it is apparent upon the face of it, that with a total amount of appraisals for the years 1895 and 1896 largely in excess of the whole bi-annual appropriation,

together with the almost certain knowledge that the new and much more certain methods of diagnosing and controlling the disease through the aid of tuberculin tests will compel an increased expenditure of both time and money; that the amount thus far appropriated is entirely insufficient to insure any reasonable or effectual continuance of the work.

In 1895, forty-three head of horses were condemned and destroyed at an appraisal of $1,927.50, and seventy-nine head of cattle were also condemned and destroyed at an appraisal of $2,459, the total amount of appraisals for that year being $4,386. In 1896, forty-five head of horses were condemned and destroyed at an appraisal of $1,967, and 202 head of cattle were also condemned and destroyed at an appraisal of $7,063.50, the total amount of appraisals of the year being $9,030.50, amounting in the two years to $13,416.50 for which was appropriated at the last session of the legislature the sum of ten thousand dollars out of which was expected to be paid, all the expenses and pay of three commissioners and for all animals destroyed under the provisions of this act. The same difficulty has been experienced for the past two years as in all previous bi-annual appropriations; we can meet the first year's expenses by paying out of the second year's funds whatever deficiency proves to exist at the end of the first year; only to find ourselves entirely out of money early in the second year, and then continue to do business on credit, and become indebted to every owner for whom we condemn an animal, until such time as the deficiency can be provided for, to the great inconvenience of all concerned.

The largely increased business of 1896 over that of 1895 is a case in point. At the close of business in 1895, we had overrun the amount of the annual appropriation over $2,000, which amount could be rendered available January 1, 1896, by paying out of the second year's funds the indebtedness of 1895, only to find ourselves with approximately one-half the annual appropriation to continue the business of 1896, so that early in the present year we were entirely out of funds, and only able to continue the business of the year by the special authority of the Governor and Council as the law provides. The inconveniences and hardships to many men and even women, to whom money is now long since due for animals destroyed by order of the commissioners, have proved much greater

this season than ever before; and has grown largely out of the fact that demands upon us by various "boards of health" throughout the State, to have all cows tested with tuberculin, from which certain cities and towns derive their dairy products, have doubled the expenses heretofore incurred in making physical examinations, together with the undisputed fact that such tests would surely disclose an increased number of cases of tuberculosis to be paid for and destroyed.

Early in May, 1896, the Portland board of health demanded that the herds furnishing milk to that city should be inspected by the commissioners, not that they had proof of any diseased milk being brought to their market but were apprehensive that such might be the case. A great many herds were inspected that were within reasonable distance of Portland; and although our examinations were made among a class of cows that were many of them forced for the production of milk, which would be a factor in developing the disease; tuberculosis was discovered only late in the season in but one single herd of cows whose milk was sold in that city, although during our investigations, we discovered two herds in New Gloucester that were quite badly diseased, but their product had been made into butter and never sold as raw milk.

This was the first examination asked for by any city or town in Maine, where the whole expense incurred would have to be borne by the State, and while we recognize the importance and oftentimes the necessity of such inspections, it would be unfair to the taxpayers at large to select a certain portion of the State, and examine all in that portion, or examine all the cattle supplying one city and leave all the others, unless a systematic inspection was ordered, and then separate the inspected territory and allow no animals to cross that line until they were also inspected; until the entire State had been covered, and all animals found tuberculous had been condemned and destroyed.

When we come to consider that there are over one hundred and fifty thousand milch cows in Maine, and that if this class of animals alone were to be tested with tuberculin, it would cost the State over *one hundred thousand dollars* to do the work; the fallacy and inexpediency of such a proposition becomes self evident, in view of any appropriation yet provided to carry out the provisions of the law under which we act. The "Board of Health" of Lynn, Massachu-

setts, also made a demand early in the season of 1896, that all cows furnishing that city with milk should be tested with tuberculin previous to May 1st, and this order affected a good many farmers living in the western portion of the State, in Kittery, Eliot and North Berwick.

These three towns furnished Lynn daily with the milk of at least five hundred cows, and while the tests were made practically at the expense of the farmers themselves, our board co-operated with them, and agreed to pay for the testing of all cows that proved to be diseased, which proved to be confined to twelve head, in the two former towns appraised at $520.00. The following notice was issued by the "Board of Health" of Lynn.

BOARD OF HEALTH OF THE CITY OF LYNN.

RULE 35.

On and after May 1, 1896, for all milk brought into or offered for sale in the city of Lynn, satisfactory evidence will be required of the producer and dealer by the Board of Health that the milk has been drawn from healthy cows. The condition of health is to be based upon results of tuberculin test by a veterinarian that is satisfactory to the State Cattle Commission and to the inspector of milk for the city of Lynn. After test each animal to have ear tag and certificate of health. Also that the animals used are properly fed and the premises occupied by them are in a good condition of sanitation.

WILLIAM LACROIX,
W. B. LITTLE, M. D.,
CHARLES LEIGHTON,
Board of Health.

Adopted March 2, 1896.

In June the "Board of Health" of Old Orchard passed an order that no milk should be sold in their town unless from tested herds, and the same arrangement was made with our board, as in the cases at Kittery and Eliot, that if any animals reacted to the test, they should be at the expense of the State, with the result that eight cows, a bull and two calves were found diseased, and were condemned and destroyed at an appraisal of $395.00, the whole number tested being about 200 animals. It is a significant and

important fact bearing upon the amount or percentage of tuberculosis in this State, that out of the large number of 700 cows tested with tuberculin that less than twenty-five animals were condemned and destroyed. Another fact in connection with these cases was that the major part of the cows condemned were found in two herds, where some previous case had been brought among them and allowed to remain, until they had "leavened the whole lump."

It is now an accepted and unchallenged fact that Maine has less tuberculosis among her bovine population than any other New England State, but unless the same watchful care is exercised in the future as in the past, what we have will increase and furnish seed for an abundant harvest. Your commissioners believe that the near future will disclose the fact that no milk can be sold in open market in this State, unless certified to by the proper authorities that it is from tested herds, and no man will buy a cow for his own use unless she is tested before he pays for her.

Eternal vigilance is the price of health as well as liberty, and all intelligent communities are awakening to the vital importance of having their milk supply free from the bacillus of tuberculosis.

This is not a case of "dollars and cents," it is a case of "life and death." There is now a consensus of opinion among the best authorities, that tuberculin is the surest and about the only reliable test yet discovered to decide those earlier stages of the disease which are almost impossible to discover by the most expert physical examination such as we have always had to rely upon in the past.

In several cases the past season large herds have been tested at the State's expense wherever we could make out even a single case of tuberculosis by physical examination; so as to make sure there were no animals left behind that required tuberculin test to disclose their diseased condition. In a large herd of Jerseys, where one cow was unmistakably diseased, we found two others that could by no possibility have been made out except by the crucial test; and again in another large herd, the one we originally discovered proved to be the only one diseased, all the others failing to react. Isolated cases are constantly coming to our notice, however, where it is known the animal had recently been kept among a large herd of cows, which certainly ought to be inspected, and this proved to be the case in a thoroughbred bull condemned at Livermore Falls in February last, that proved upon post mortem to be thoroughly dis-

eased. In this case our attention was drawn to the fact that this bull had been recently standing in a large herd, and upon inspecting the home herd, three other cases were discovered and destroyed.

If this policy is to be pursued in the future, the demands upon our board will be largely increased, as there are other cases now pending where no doubt the same course should be pursued, but can only be done at an increased expense, which the present appropriation is entirely inadequate to allow, but we prefer to state the "cold facts" for the consideration of the incoming legislative bodies, rather than to continue to urge upon them what we believe to be the prime necessities of a financial support, that has already been too long delayed.

While Massachusetts has an annual appropriation of $300,000.00, Maine has but one-sixtieth part of this amount, and while it is now well known there is a much larger percentage of disease in the former State, there is no such amount of difference as the money appropriated would indicate.

MASSACHUSETTS CATTLE COMMISSION.

BOARD OF CATTLE COMMISSIONERS,

52 VILLAGE ST., BOSTON, August 8, 1896.

Editors American Veterinary Review:

DEAR SIRS:—I note in the last REVIEW an editorial on the Massachusetts Cattle Commission. I thought you would be interested to know that the first appropriation was $35,000, 1894; the second, $150,000, 1895; and this year, $300,000—$50,000 more than was asked for in the annual estimates submitted to the auditor.

We have now on file five times as many applications for herd tests as we could attend to with double our funds.

Yours sincerely,

A. J. SHELDON.

The *Philadelphia Veterinary Journal* says: "The sober second thought of an intelligent and thinking people generally proves sound and trustworthy, and the outcome of the thorough open discussion of the whole subject of tuberculosis and its every aspect and phase from the point of view of the Tuberculosis Commission of

the Bay State has won for the people of that Commonwealth the most significant and far-reaching victory achieved in the past ten years. The appropriation asked for the present year to continue the good work (being done there for the whole world) was raised fifty thousand dollars above the original appropriation asked for, and the commission will have at its command three hundred thousand dollars, which we are fully sure will bring more than that measure of benefit to the people of Massachusetts, not to mention the great benefits indirectly derived by the progressive people the world over. This tribute to the worth of a commission whose zeal and efforts have been of the most earnest, sincere, and intelligent character must come to them as a solace and comfort, after the smoke and fury of the battle have passed away. While it places a greater responsibility than ever upon their shoulders, none who are acquainted with the high character of the men comprising the commission will not for a moment have the slightest fear or anxiety that these higher and graver duties will be discharged with the same fidelity and faithfulness as in the past. All honor to the legislative servants of the people of Massachusetts! All praise to the confidence reposed in her commission, and well done to these good and faithful servants, who, while working within the confines of a State, are nevertheless doing the world's work!

A lesson for every commonwealth to study.

The question of the reliability of tuberculin as a diagnostic agent seems to be settled beyond a doubt by the candid man. There are and always will be doubting Thomases, but the mass of evidence and experience seems clearly to be in the affirmative.

Extended and interesting hearings were held during the past winter by the legislature upon this and kindred subjects, at which neighboring states were represented by their officials, and the general expression of opinion from them was that Massachusetts had started upon the proper course, and they heartily sympathized with the action taken and would co-operate with her.

There has been opposition to the work of our State Cattle Commission, some of it honest—some of it anything but honest—much more coming from a desire apparently to be seen and heard of men than from honesty of purpose. The profession, as a rule, has been in sympathy with the work carried on, but I regret to say there have been a very few who have evidently found that the grapes

were sour which were presented to them, while with others there has been simply a candid difference of opinion and belief.

The general feeling among the cattle-owners of the State at the present time is that the sooner tuberculosis is eradicated from our herds the better.

In March last we received from Belfast the lungs of three sheep, which were submitted to Dr. Smith, and his report conclusively proves that we have had pulmonary phthisis in at least one flock of sheep in Maine. The interest in these cases is increased by the fact that no tuberculosis exists among the cattle upon the farm where these sheep are owned, but the owner who bred them and has cared for them for the past two years has recently died of consumption.

PORTLAND, MAINE, March 13, 1896.

Dr. George H. Bailey, Secretary State Cattle Commission.

DEAR SIR:—March 6th, I received from Mr. F. O. Beal of Bangor, of your Commission, a box containing the lungs of three sheep, which I examined, and reported upon to him.

They were numbered one, two and three, respectively.

I found in all of them masses from the size of a split pea to a marble, which upon subsequent examination proved to be tubercular.

Most of these masses were at the apices of the lungs, several immediately beneath the pleural covering upon the free borders of the lobes. They showed pumlent cheesy and calcareous degeneration.

Tubercle bacilli were found in the tissue next the bronchi, and in pus from several of the tubercles.

Specimen No. 1, showed an inflammatory area upon one side as large as a quarter with laceration of the pleural surface as though it had been forcibly torn away from a rib.

Very truly yours,

CHARLES D. SMITH.

In April last our board was notified by the selectmen of Hebron, that a flock of sheep in that town were manifesting symptoms of tuberculosis, as indicated by emaciation, cough, etc. An inspection of the flock resulted in an autopsy which disclosed the fact that the flock was suffering from esophagotomy, a nodular disease

of the intestines. A portion of the viscera was submitted to Dr. Charles D. Smith, pathological examiner of the commission, who returned to us the following letter:

PORTLAND, April 24, 1896.

Dr. Geo. H. Bailey, D. V. S., Secretary Board of Cattle Commissioners.

DEAR SIR:—I have completed a long and careful examination of the nodules glands and portions of intestine from sheep, submitted April 13th.

I am not able to find any evidence of tubercle. There is an infection of the usual form of inflammation producing organisms, but not the bacillus of tubercle. It is probable that the nodules in the intestine are the result of parasitic irritation and the pus and caseous degeneration are the result of the inflammation process. The enlarged lymphatics are the result of an extension of the inflammation.

I have to report therefore that the diseased condition is not tubercle.

Very truly yours,

CHARLES D. SMITH.

Although tuberculosis is a very rare disease in sheep, there is a superficial resemblance to the tumors found upon portions of the intestinal tract, that induced Dr. Smith to make the experiments more for negative evidence than from any expectation of finding bacilli. Esophagotomy is a disease causing heavy losses, for it seriously affects the health of the sheep, and renders the intestines valueless for making sausage casings. Though the latter result would seem trivial at first sight, it is by no means unimportant, for sausage makers are compelled to import the greater part of covering material used in their business. The disturbances of health produced are very serious, as reported by Dr. Salmon, Chief of the Bureau of Animal Industry, who at one time lived in the South, and made many post-mortem examinations on diseased sheep, and found nothing but these intestinal tumors to account for the severe symptoms of disease which they exhibited, and has stated that he believes this malady is the chief obstacle to successful sheep husbandry in some portions of the Southern States.

"*The diagnosis* of this parasitic disease can only be made from a *post-mortem* examination. In the living sheep there may be signs of general debility—bloodless lips and eyes, thin sides and flanks, dry wool, etc. It may be that nothing else will be noticed, but that the flock is not in quite good condition; or in severe cases the diarrhea and emaciation may be excessive. Dr. Salmon believes the disease may bring death to its victims in the severest cases. My own observations have been confined to the abattoirs, where salable animals only are brought. As the adult worms are comparatively few as compared with the tumors, it is probable that the adults of this species cause but little trouble; but the embryos, on the contrary, cause a great deal. The disease is an insidious one, for not only is the rate of infection gradual, increasing slowly in amount from week to week, but the rate of development of the tumors is very slow, apparently requiring months. It is only when the disease is well advanced that its cumulative effects can be noticed.

The disturbance of digestion caused by this parasite is mainly due to the derangements of the functions of the *cæcum*. This derangement is not serious until the resulting tumors become exceedingly numerous, well advanced in growth, and press upon the more essential mucous membrane, disturbing its functions.

The most seriously affected sheep found in the abattoirs are noticeably poorer, and one would be tempted to believe, were he to judge from the "knotty" viscera, as the butchers call them, that such animals should have died from the disease long before. These sheep usually have diarrhea, a disease which weakens the affected animals. Flock-masters who mistrust that their sheep are not doing well, and who know of no cause for it, should sacrifice one or two of the poorest to make a diagnosis. The meat of such sheep, though not quite as fat as other mutton, is suitable for food, and could not be distinguished in the market from other mutton.

Prevention—For the tumors caused by *Œsophagostoma Columbianum* there is no remedy except the removal and extermination of the adult worms. These adults are usually buried deeply in the mucous secretions and attached to the membrane of the large intestine. They may be found in considerable numbers in older sheep. The medicinal remedy must therefore be one which will remove them from these places. It is probable that such a one can eventually be found, but at present none can be recommended. It is

probable that some one of the surer remedies advised for other intestinal parasites will do for these. In case medicinal remedies are tried each animal must be dosed. The killing of the adults will of course lessen the number of eggs with which the sheep become infested. As the eggs of this parasite pass to the ground the sheep may get them either while pasturing or drinking. The same care in changing pastures, in providing good drinking water and a plentiful supply of salt, should be observed as for other parasites. Judicious fall and winter marketing of infected sheep will also tend to lessen the chances of infection. If pastures are known to be permanently infected, then they should be turned over to other stock for a year or two before being again grazed on by sheep. When it is practical on the smaller farms the sheep lots should be plowed and either planted or left fallow. The object of change of pasture and of plowing is nearly the same; in the one case, to wait until the parasites have died out; in the other, to bury them beneath several inches of soil, from which the sheep-owner may rest assured they will not emerge."

In May last our board received notice of a sudden outbreak of disease among some calves upon a farm at Livermore, and in the vicinity of some cases at Canton last season, involving the loss of quite a number of young animals given in our last report. An inspection and post-mortem upon the premises, assisted by Dr. Stanwood, M. D., of Canton, revealed the fact that the calves had died of anthrax, of which the previous cases at Canton were the only ones that had been found in Maine, at least since the present law took effect. Below we offer the results of Dr. Smith's microscopical examination.

PORTLAND, ME., May 27, 1896.

Dr. George H. Bailey, Secretary State Cattle Commission.

DEAR SIR: I have finished examination of the spleen and blood you submitted May 14.

I found the blood swarming with bacilli which in cultures and by direct examination seem to be identical with the anthrax bacillus. The spleen is thickened, inflamed and shows the presence of the same bacilli.

Very truly yours,

CHARLES D. SMITH.

ANTHRACOID AFFECTIONS—CHARBON.

A number of diseased conditions of cattle, apparently distinct from each other, may be associated under this heading. They are of the highest importance, for they are communicable and are highly fatal. Acute disorder may suddenly set in and run its course in a few hours, in other cases the attack may extend over days. Prophylactic means are most important. All pastures known to be favorable to the development of anthrax ought to be kept free from cattle for a number of years. The carcasses should be buried in the hides, after being thoroughly slashed and filled with quicklime. All stables occupied by cattle affected with anthrax should be thoroughly disinfected; and attendants should be warned that the disease is communicable to man by inoculation. Under no circumstances should the milk of animals suffering from anthracoid diseases, be used as food for man or other animals. The rarity of this disease, however, in this State, renders the danger from milk of infinitesimal importance as compared with the milk from tuberculous animals, and we have had several cases that have developed the wisdom of applying tuberculin tests where any valid suspicion attached to a herd, whose whole product was being sold in the open market. A case in point was found in one of the herds tested at Old Orchard, in which eight animals out of thirteen proved to be diseased. This herd was tested at the request of the Chairman of the "Board of Health," who had taken for a long time his own supply from that herd. The autopsy of these cows proved them to be in an advanced stage of the disease, although outwardly they appeared to be in good physical condition, and were yielding an average supply of milk. One of the herds tested at Kittery was in approximately the same condition of the one at Old Orchard, and these two herds proved to be the only ones in which we found more than a single cow affected, and that were among but six or eight other instances where we have discovered more than isolated cases during the past year in Maine. It is a significant fact that in the history of every one of these herds, the same fact was disclosed, that they could trace their exposure to the disease to some previous case that had been brought into them and allowed to remain until other cases developed. And we may fairly decide the small number found diseased in these milch herds, to be a much better indi-

cation of the true percentage of tuberculosis to be found in Maine, than of the few herds discovered just at the close of the year; when we come to consider that new animals were being constantly brought into such herds to keep up the supply of milk contracted to be delivered, together with the fact that many large herds have also been tested with tuberculin during the year, in which not a single case of tuberculosis, has been discovered.

Our quarantine against Massachusetts and all other states is still in force and was supplemented on November 12, 1895, by another much more sweeping in its provisions, and which had become absolutely necessary, not only to provide against cattle from Massachusetts coming here in violation of our quarantine regulations, (which had occurred in several instances,) but also to prevent whole droves and car loads of cattle coming into Maine from other infected states, without any permit, or without having been submitted to tuberculin tests, which latter requirement has since been adopted and agreed to by all the boards of cattle commissioners of the New England states, in convention at Providence, R. I., November 20 to 23, 1895.

We are constantly in receipt of letters asking for information in regard to bringing cattle into Maine, (chiefly for breeding purposes) and it will be necessary in the future to have all such cattle properly tested with tuberculin and the proof of such tests furnished some member of our board, *when*, *if approved*, a permit will be granted to the owner, which will insure his cattle not only to be accepted by the transportation agent of any company whose terminus is Maine, but will ensure no detention while en route to their destination. The permit thus granted accompanies the waybill from the point of shipment, and unless such a permit is furnished to the railroad or steamboat agent, no cattle will in future be accepted for transportation. It will be seen by reference to section 7, chapter 177, of the Maine law, that such transportation companies are held responsible for all such shipments. Section seven is as follows:

"SECT. 7. That no person or persons owning or operating any railroad, nor the owner or owners, or masters, of any steam, sailing, or other vessels, within the state, shall receive for transportation, or transport from one part of the state to another part of the state, or to bring from any other state or foreign country any ani-

mals affected with any of the diseases named in section two of this act, or that have been exposed to such diseases, especially the disease known as tuberculosis, knowing such animals to be affected, or to have been so exposed nor shall any person or persons, company or corporation, deliver for such transportation to any railroad company, or to the master or owner of any vessel, any animals, knowing them to be affected with, or to have been exposed to, any of said diseases; nor shall any person or persons, company or corporation, drive on foot, or transport in private conveyance, from one part of the state to another part of the state, any animal, knowing the same to be affected with, or to have been exposed to, any of said diseases. Any person or persons violating the provisions of this section, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by fine not exceeding the sum of two hundred dollars, or by imprisonment not exceeding six months, or by both fine and imprisonment."

It has been somewhat difficult in the past to furnish direct evidence of persons becoming affected with tuberculosis through the continued use of diseased milk, and one of the cases that has attracted a good deal of attention has recently occurred in Massachusetts, and we furnish a full account of it from the *Boston Herald:*

ASHFIELD, Nov. 15. Were the several cases of consumption in the family of the late Chauncey Boice of this town occasioned by taking tuberculosis from the fine herd of Durham cows now owned by Mr. Boice's sons?

Mr. Boice, who was one of the most highly respected farmers of this section, died a little less than two years ago from consumption.

His brother Lemuel, who lives near by, is sick, as supposed, from the same disease, and a sister died from the same cause about eight years ago.

Only to-day, thirty-two of the fine herd of forty Durham cattle owned by S. H. and A. C. Boice, the two sons of the late Chauncey Boice, have been driven out of town on their way to Dalton, where they will be killed and the bodies used for fertilizer.

All of these cattle were examined a day or two ago by Dr. Mark L. Miner of Greenfield the Franklin county agent of the state cattle commissioners. The thirty-two cattle were submitted to the tuberculin test, the most healthy of the entire lot was killed and

found to be terribly diseased, and the cattle were to-day hurried out of town, and will be killed as quickly as possible.

The Boice brothers do not believe that the cause of consumption among members of their father's family came from the cattle, and local opinion takes the same view. On the other hand, one of the brothers has openly asked if it was possible that the cattle took the germs of the disease from "the old-fashioned cases of consumption" that have caused the death of members of the family.

Two things are certain. As fine a herd of Durham cattle as there is in Franklin county, and perhaps western Massachusetts, that has been bred with the greatest of care, has been found beyond all question to be thoroughly impregnated with tuberculosis, and two members of the Chauncey Boice family have died with consumption, while the brother Lemuel is sick with the same disease.

Chauncey Boice was a large, stalwart man, and seemingly he must have had at one time excellent lungs.

From the conversation of Mrs. Chauncey Boice and one of the sons, Dr. Miner was fearful that the disease might have been communicated to human beings. Dr. Miner says that the cream from the herd has been sold to the Ashfield creamery, a concern that has the reputation of making excellent butter.

The buttermilk from the creamery, which has cream from many different farmers, has been fed to hogs, and that some of these hogs were found to be suffering from tuberculosis.

Dr. Miner does not give a professional opinion as to whether or not consumption has been actually transmitted to human beings, but he says that experts say that there is danger of this being done.

He does say that when the most healthy cow out of the thirty-two that responded to the tuberculin test was killed nearly a pint of poisonous pus spurted from a fester in the lungs. The cows that are killed by order of the state are buried after being thoroughly saturated with kerosene oil.

Dr. Miner says that the spittle that is coughed from the lungs of cows might readily dry and germ fructify which might give the disease to a human being.

Dr. Miner is cautious in the statements he makes, and does not wish to unduly alarm the people, but he believes that great care should be taken. In Greenfield a cow was recently killed that was found to be terribly diseased with tuberculosis, and the milk from the cow had been sold in the village.

Not many months ago the child of a Mr. Crowningshield in Greenfield died after drinking the milk from a cow that a little later was found to be badly diseased. Several guinea pigs were inoculated with the pus from the cow, but they did not take the disease.

In the section he covers, Dr. Miner has ordered several hundred cows to be killed during the last year and a half that had responded to the tuberculin test, and all were found to be badly diseased.

Now that the state pays full value for cows that are killed and found to have tuberculosis, the farmers are much more willing to co-operate with the authorities in stamping out the disease.

WHOLE HEAD INFECTED.

Thirty-one valuable cows out of forty on the splendid farm of Boice Brothers, at Ashfield, killed.

A tuberculin test in the little town of Ashfield has resulted in the slaughter of thirty-one cows out of a herd of forty, and promises to develop into a matter of international importance from both a medical standpoint and that of everyday life.

In brief, tuberculosis, or as commonly called consumption, was demonstrated by post-mortem examinations in an advanced stage in over three-fourths of the finest herd of Durhams, "short horns," in northwestern Massachusetts, if not in the entire state, and deaths in the family of the owner from the same disease are now being attributed to the milk from this herd.

Through the whole of Franklin county there is no better-known dairy farm than that of S. H. and A. C. Boice. Their father before them had made a reputation for high-grade stock and the excellence of his dairy products.

As a matter of fact, the herd has been looked upon with pride by the people of Ashfield for years as by odds the best in that section, and the Boice Brothers sent more spaces of cream to the local creamery than any other farmer or stock raiser in the town.

The Messrs. Boice were proud of their family homestead, but prouder still of their cows and thoroughbred bull. What is more, no one blamed them.

All the animals were young and apparently in the finest condition. Such a thing as sickness was unknown, and the owners gloried in an unsurpassed record for the finest milk and cream obtainable.

So certain were they of the healthfulness of the herd that the law which went into effect from June 5th last, requiring an application from the owner to the cattle commissioners before animals would be tested by the injection of tuberculin did not meet with their approbation. But they filled out the necessary blanks and in due time Dr. M. L. Miner of Greenfield received the commission and notified the Messrs. Boice that he would test the herd this week.

Wednesday was set and the Boice Brothers invited not only the representative farmers of the neighborhood, but the selectmen of Ashfield to be present and they all came.

The value of the herd was of itself sufficient to warrant every precaution, even though the record of past mistakes was only one-tenth of one per cent, and from reports even Dr. Miner was surprised when one after another the animals gave such decided reactions to the test as to condemn thirty-one out of forty.

Both the selectmen, as guardians of the public health, the half-score of farmers present and the Messrs. Boice now became painfully interested.

Then the work of killing the condemned animals began, but was quickly stopped by the owners and selectmen "in the interests of health."

The lessons shown in every case where a post-mortem was performed were so palpable that the owners were entirely satisfied, and the selectmen ordered that the remainder of the herd be driven to a rendering works outside the town before they were killed.

Having settled the fact that tuberculosis was present in the herd to a virulent degree, the question of whether or not the deaths in the Boice family are traceable to germs that came through the milk is interesting not only the good people of Ashfield, but is being taken up by scientists.

Dr. Osgood, chairman of the Massachusetts cattle commission, was seen in regard to the matter. He said:

"This case is certainly a most interesting one, and promises to awake the keenest research and study not only among medical men, but among the people themselves.

"It can be said, even from a most conservative standpoint, that the circumstances surrounding the finding of tuberculosis so well defined in the herd belonging to the Boice Brothers is significant when the deaths in the family from consumption are taken into consideration.

"It must be remembered that, according to the best authorities, tuberculosis is infectious and not necessarily hereditary. It was through belief in this doctrine that Massachusetts has carried on the fight to stamp out the disease, and at last the work of educating the people is beginning to tell.

"That tuberculosis can be planted in the human system through the milk of a diseased cow is now admitted, but it is the most difficult matter imaginable to connect the case of consumption directly with an animal having tuberculosis.

"In the case of the cattle belonging to the Messrs. Boice, I should think such a thing possible to obtain. Ordinarily we do not give out the names or circumstances where disease has been found and the cattle killed, but as the Boice Brothers invited their friends and neighbors as well as the selectmen to watch the test, and publicly acknowledge that they were satisfied, I can see no harm in showing a letter I have just received from Dr. M. L. Miner."

This is a copy of Dr. Miner's letter:

November 13, 1895.

Dr. F. H. Osgood, Boston, Mass.

DEAR SIR: I enclose report on the herds owned by the town of Ashfield and by S. H. and A. C. Boice.

The herd of S. H. and A. C. Boice was considered the best herd in Ashfield, and sent more spaces of cream to the local creamery than any other herd in town.

The animals were all young and in good condition and new milch. The bull is thoroughbred.

Several representative farmers and the selectmen saw the herd. I have no doubt but each animal would have sold quickly at the appraisal.

Yours truly,

M. L. MINER.

P. S. Mr. Boice died of tuberculosis, also several of his family.

"Thirty-one out of forty were condemned and killed," continued Dr. Osgood. "It is but fair to say that the Messrs. Boice have acted in a most honorable manner all the way through.

"Their cattle were examined and tested at their own request in writing, and they express themselves as satisfied beyond a doubt and take their loss like men.

"From what I have heard, I am satisfied they are anxious to do all in their power to stamp out the disease. It is public-spirited

men of this kind that not only send a ray of sunshine into our work but deserve the thanks of the people."

In the State of Pennsylvania, the city of Pittsburg has passed the stringent ordinance which we give in full.

An Ideal Ordinance Regulating the Milk-supply. An ordinance prohibiting the sale of adulterated, unwholesome or impure milk in the city of Pittsburg; regulating the sale and traffic in milk; providing for the licensing of persons, firms, or corporations dealing therein; the making of examinations and tests of animals producing milk, and fixing penalties for violation of this ordinance.

SECTION 1. *Be it ordained and enacted by the city of Pittsburg in Select and Common Councils assembled, and it is hereby ordained and enacted by the authority of the same, that* whoever by himself, or by his servant or agent or as the servant or agent of any person, firm, or corporation, sells, exchanges, or delivers, or has in his or their custody or possession with intent to sell, exchange, or deliver, or exposes or offers for sale as pure milk, any milk from which the cream or any part thereof has been removed, or which has been adulterated, or changed in any respect by the addition of water or other substance, shall be liable to the penalties hereinafter provided in this ordinance.

SEC. 2. No dealer in milk and no servant or agent of such dealer, firm, or corporation shall sell, exchange, or deliver, or have in his or their custody or possession with intent to sell, exchange, or deliver, milk from which the cream or any part thereof have been removed, unless, in a conspicuous place above the centre, on the outside of each vessel, can, or package, from or in which such milk is sold, conveyed, or delivered, the words "Skimmed Milk" are permanently soldered in metallic letters not less than one inch in length, the said can, vessel, or package to be painted or japanned a bright blue color. Whoever violates the provisions of this section shall be liable to the penalties hereinafter provided in this ordinance.

SEC. 3. No person, firm, or corporation shall sell, exchange, or deliver, or have in his or their custody or possession with intent to sell, exchange, or deliver, skimmed milk containing less than nine (9) per cent. of the milk solids, exclusive of butter fat. Whoever violates the provisions of this section shall be liable to the penalties hereinafter provided in this ordinance.

SEC. 4. That every person, firm, or corporation who shall sell or offer for sale, or who shall transport or carry for the purpose of sale, or shall have in his or their possession with intent to sell, any impure, adulterated, or unwholesome milk, and every person, firm, or corporation who shall adulterate milk, or who shall keep animals for the production of milk in a crowded or unhealthy condition, or unsanitary premises, or feed the same on food that produces impure, diseased, or unwholesome milk, or who shall feed said animals on distillery waste, usually called "swill," or upon any substance in a state of putrefaction or rottenness, or upon any other substance of an unwholesome nature, or who shall not allow said animals free movement in the open air at pasture at least six hours each day, shall be liable to the penalties provided in this ordinance.

SEC. 5. That the addition of water, ice, or any other substance or thing to milk is hereby declared to be an adulteration, and milk that is obtained from animals that are fed on distillery waste, usually called "swill," or upon any substance in a state of putrefaction or rottenness, or upon any substance of an unwholesome nature, or milk that has been exposed to or is infected by the emanations, discharges, or exhalations from persons or animals having any contagious disease by which the health or life of any person or animal may be endangered, or milk from tuberculous animals, or animals suffering from any febrile disease, is hereby declared to be impure and unwholesome.

SEC. 6. No person, firm, or corporation shall sell, exchange, or deliver, or transport, or have in his, her, or their possession for the purpose of sale any milk which contains more than eighty-seven and fifty (87.50) one hundredths per centum of water and less fat than three (3) per centum, and the specific gravity of which at sixty (60) degrees Fahrenheit is not between one and twenty-nine (1.029) one thousandths and one and thirty-three (1.033) one thousandths, and all milk of lower grade or quality than is established by this section shall be deemed and taken and is hereby declared to be adulterated and impure within the meaning of this ordinance.

SEC. 7. On and after the expiration of thirty days from the passage and approval of this ordinance, for all milk brought into or offered for sale in the city of Pittsburg, satisfactory evidence must

be furnished to the Bureau of Health, by the producers or dealers in said milk at their own cost and expense, that said milk has been produce dby healthy animals, and especially that they are free from tuberculosis; which conditions of health shall be determined by examinations and tuberculin-tests to be made by a veterinarian who is satisfactory to the State Live-stock Sanitary Board and the Superintendent of the Bureau of Health. After said examinations and tests have been made the veterinarian shall place upon each animal found by him to be in a healthy condition an ear tag, to be furnished by the Bureau of Health, and also furnish to said bureau a certificate, upon a form to be issued by it, setting forth that each of said animals, describing the same, is free from disease, is being properly fed, and that the premises occupied by them are in good sanitary condition, which examinations and tests shall be required and certificates furnished regarding each and every additional animal purchased or secured by said producers, thereafter. Subsequent examinations, tests, and certificates as aforesaid may be required by the superintendent of said bureau whenever in his opinion, based upon reliable information, any of said animals are in an unhealthy condition or the premises occupied by them are in an unsanitary state.

SEC. 8. The Superintendent of the Bureau of Health shall, on or before the first day of September of each year, license all persons, firms, or corporations who convey milk in wagons or otherwise for the purpose of selling the same within the city of Pittsburg, said license, to be renewed annually. He shall also keep a record of their names, residences, places of business, number of wagons or other vehicles used for the purpose, and the number of the license. The latter, together with the name of the owner, and the number of the wagon or vehicle shall be legibly painted on each outer side of all wagons or vehicles used in the conveyance or sale of milk, in letters not less than two inches in height. Said superintendent shall also annually license and register every person, firm, or corporation selling or offering milk for sale in a store, stand, or market-place within the city, which license shall be displayed conspicuously in said place of business. The dealer or vender shall upon the written order of the Superintendent of the Bureau of Health pay into the city treasury the sum of one dollar and receive therefor a receipt, presentation of which at the office of

the Bureau of Health shall entitle said person, firm, or corporation to a license; provided that all the provisions and requirements of this ordinance have been complied with.

SEC. 9. Every person, firm, or corporation engaged or desiring to engage in the sale of milk as aforesaid shall make written application to the Bureau of Health, upon blank forms to be furnished by said bureau, asking that a license be issued, authorizing the same.

SEC. 10. That any person, firm, or corporation who shall engage in or continue the sale of milk in said city without first having obtained such license or who shall violate or fail to comply with any of the provisions of this ordinance shall be liable to a penalty not exceeding fifty (50) dollars for the first offense, and a penalty of fifty (50) dollars for a second or any subsequent offense, to be sued for in the corporate name of the city of Pittsburg, and recovered in the manner provided for the recovery of debts or penalties of like amount.

SEC. 11. In addition to the penalties mentioned and provided in the foregoing section, the Superintendent of the Bureau of Health may, by and with the consent and approval of the Director of the Department of Public Safety, revoke the license issued to the said person, firm, or corporation so offending, which license shall not be renewed or reissued during a period of one year thereafter.

SEC. 12. That any ordinance or part of ordinance conflicting with the provisions of this ordinance be, and the same is hereby repealed so far as the same affects this ordinance.

Dr. James Law, of Cornell University, says: Unsuspected poisoning by sterilized meat and milk of tuberculous animals.*

"With an unaccountable shortness of vision, medical and veterinary sanitarians alike have never, up to the present hour, looked beyond infection by the tubercle bacillus in estimating the danger to man of tuberculosis in our flocks and herds. We find, accordingly, that the question kept continually before the public is that of the presence or absence of the tubercle bacillus from any food-product—meat, milk, butter, or cheese—furnished by the diseased or suspected animal. The question of the presence or absence of ptomaïnes or other toxic elements which are calculated to prove hurtful or even fatal to certain members of the human race, is not

*Read before the New York State Veterinary Medical Society, January 9, 1894.

for a moment considered. Hence we are met by the argument that tubercle is rare in the muscular system of cattle, and that muscle juice is inimical to the bacillus, and that therefore the muscular tissue which makes up the great mass of the dressed carcass, may as a rule be safely eaten, even though the internal organs have been affected by tubercle."

"If, now, we consider the prevalence of tuberculosis in the human population, and realize that every eighth death is that of a tuberculous person, we see what a fearful risk is being run by the utilization of the meat and milk of animals so affected, even if it could be shown that as consumed the meat and milk are free from the living bacillus. Such reckless consumption of the products of tuberculous animals can only be looked on as a direct means of sealing the fate of that large proportion of the community which is already slightly affected with tuberculosis.

"In my experience with tuberculous cows, cases have come to my knowledge in which invalids drinking the milk of such animals have suffered very obviously, and have improved after such milk has been withheld. So, too, in the case of calves sucking phthisical cows, they have done badly and proved unthrifty though they took the whole of the milk furnished by their respective nurses, and they have thriven better when weaned and put upon solid food alone. I have followed some such calves until they grew up and were slaughtered, and have made post-mortem examinations and found them bearing old calcified tubercles, pointing back to the time when they sucked the infected and poisonous milk.

"We may freely allow that the transmission of the bacillus from man to man is far more common than from beast to man. But though the implanted seed may have been in many cases derived from a fellow-man, its subsequent destructive career may be due far more to the constant accessions of the soluble toxic products conveyed in the meat and milk of tuberculous animals. Without these continuous doses of the soluble poisons, the implanted germ would in many cases have proved comparatively harmless. Although it could be proved in regard to many cases that the cow had not contributed the seed of the disease, she is left little less responsible for the destructive progress and fatal result. The germ which might have remained comparatively dormant and harmless in the absence of the poisoned meat and milk, is by these stimulated to a more deadly energy.

"This hitherto unchallenged factor in the progress of tuberculosis opens up new and uncultivated fields for sanitary work. The great evil ventilated in this paper cannot be effectually met without the eradication of tuberculosis from every herd kept for the supply of food-products for the public. Nothing short of this can be trusted to operate satisfactorily in putting a check upon the present fearful mortality from this disease. No inspection of dressed carcasses, nor of milk, butter and cheese will furnish a guarantee. We must go to the herds and subject them animal by animal to a critical test, and only accept the products as safe when there is no longer a shadow of suspicion remaining. A professional examination of a most searching kind must be supplemented by the tuberculin test before a clean bill of health can be furnished.

"Often when cattle were condemned by the tuberculin test have the owners pronounced them the most thrifty and the least suspected in the herd, and it was only after slaughter, when the bodies were opened and the caseated tubercles exposed, that they were satisfied that no mistake had been made.

"Recently in a herd kept for the supply of milk of guaranteed soundness, the stock having been subjected to weekly examinations by a veterinarian, the tuberculin test was applied, and fifty per cent of the herd demonstrated to be tuberculous.

"Without the tuberculin test there is no guarantee possible for the products of the dairy, and the sanitary officers who will affect to deal with this disease in herds without the aid of tuberculin are at best but pruning the tips of the branches of the evil tree. Public money ought not to be thrown away on such fruitless and ineffective work.

"The purification of a herd must be followed in every case by a thorough disinfection of contaminated buildings and places, and by a careful seclusion from new sources of infection. It is evident, therefore, that the non-tuberculous herd must be secured against the addition of fresh animals from any herd that has not been similarly attested sound, and that any necessary addition from another source must be tested by tuberculin before it is added to the herd.

"Equally important is it to test all farm animals of whatever species which live on the place and cohabit with the herd, and to see to it that no human being suffering from tuberculosis is allowed to attend on the animals or to prepare their food. It is difficult to

see how anything short of such a system can afford a guarantee of the absence of the soluble tubercle poisons from our milk, butter and cheese.

"In the case of butcher meats a professional examination when slaughtered, covering all of the viscera as well as the carcass, will be essential, and the current doctrine of sound meat with localized tuberculosis must be abandoned. Every municipality must have its own public abattoir in which alone its meat supplies should be butchered, and where every carcass should be systematically examined as it is opened. Private slaughter-houses controlled by individual owners afford endless opportunities for the evasion of sanitary statutes, and ought to be abandoned as relics of an age when modern sanitary science was unknown.

"The question of dressed, canned, and salted meats is one that must be carefully considered. It is quite evident that such products must come to us with a sufficient guarantee, if allowed to compete with our own house meats which have passed the municipal inspection. It is equally evident that no inspector paid by the packer or canner can furnish a certificate which will command public confidence. The inspector must be a government official, who is entirely independent of the packers and who is in no way dependent on their good will."

The New Hampshire legislature at its last session passed an appropriation of $100,000 to exterminate tuberculosis in that State, which was vetoed by the Governor and President Murkland of the Experiment Station sent to Governor Busiel the following communication:

He says that the reports that tuberculous cattle have been shipped into New Hampshire have truth. Such cattle are quarantined in Massachusetts and Vermont but may be shipped into this state without protest. New Hampshire might easily become the dumping ground for diseased cattle so active are boards in other states in endeavoring to stamp out the disease. President Murkland knows of an instance where an animal shipped into the state was diseased and condemned. They might have been passing through the state but there is every reason why they should leave them here.

New Hampshire is a dairy state and if it becomes known that tuberculous cattle are being shipped here there will be discrimination

against the state and we shall lose our best market; and this evil is not imaginary as a bill has been introduced in the Massachusetts legislature to keep out milk from a state where efforts have not been made to stop the spread of the disease. New Hampshire's suicidal policy of unconcern will have its fitting consequence.

There are some established facts concerning this disease which may be enumerated briefly as follows:

1. This disease is identical in nature with the diseases in man known as consumption of the lungs, hip joint disease, lupus of the skin, and some forms of meningitis.

2. This disease may be communicated from one animal to another, and is thus communicated.

3. The bacilli, the active agents of this disease, may be found in any part of the animal, and may be transmitted through the milk when there is no apparent disease in the udder.

4. The germs of this disease may be communicated to the children of healthy parents by the milk from a tuberculous cow. There are cases on record which establish this fact beyond reasonable question.

5. The test by the use of tuberculin is practically infallible. As ordinarily applied it may fail in a far advanced case where a physical examination would reveal the disease.

In view of these facts it is evident that some action should be taken at once. The board of cattle commissioners, although anxious to perform their full duty to the State, are hampered by the lack of funds. But no question of immediate expense should be permitted to destroy the leading agricultural interests of the State, and to threaten the health and the life of the people of New Hampshire.

The recent annual meeting of the United States Veterinary Medical Association concluded their labors at Buffalo by publishing the following resolve:

WHEREAS, Tuberculosis of some of our domestic animals, and especially of cattle, is a widespread and destructive disease, and,

WHEREAS, Statistics accumulated during the past year show that the disease is very prevalent throughout this country, especially in dairy herds, and indicate that it is steadily increasing, except in states where active measures for its suppression have been enforced; and,

WHEREAS, There exists in some quarters a difference of opinion as to the relation of tuberculosis among cattle to the public health, notwithstanding the fact that this matter has been the object of careful scientific inquiry by a great number of eminent scientists in all parts of the world, and that reliable and uniform results and observations are recorded in great numbers in the veterinary and medical literature; be it

RESOLVED, That it is the opinion of the United States Veterinary Medical Association that the following points have been demonstrated beyond dispute and may be accepted as fully established:

1. That the tuberculosis of man and cattle are identical.

2. That the milk of cows with tuberculous udders may cause tuberculosis in animals fed upon it.

3. That the milk from cows with extensive tuberculosis but apparently healthy udders may in some cases contain the germs of tuberculosis and cause the disease in animals fed upon it.

4. That in some cases the germs of tuberculosis appear in the milk of tuberculous cows that are not far advanced in the disease, and that have udders that are healthy, so far as can be determined by an examination made during the life of the animal.

5. Slightly tuberculous cows sometimes succumb to a sudden exacerbation of tuberculosis and furnish virulent milk for a period before it is possible to discover their condition by means of a physical examination.

6. Tuberculin furnishes incomparably the best means of recognizing tuberculosis in the living animal.

7. Tuberculin, properly used for diagnostic purposes, is entirely harmless to healthy cattle, and is so exceedingly accurate in its effects that the few errors resulting from its use cannot affect the general results, and are of less frequent occurrence than following the use of any other method of diagnosing internal diseases.

8. That the carcasses of tuberculous animals may be and sometimes are dangerous to the consumer, and all such carcasses should be subjected to rigid inspection by a competent veterinarian, and those that are condemned should be disposed of in such a manner that it will be impossible to put them on the market for consumption as human food.

9. That the importance of dairy inspection cannot be overestimated, and municipal and health authorities should be at once perfect a system commensurate with the vast importance of the subject.

Resolved, That the live-stock and especially the breeding interests of this country can never regain their former prosperity until such measures have been carried out by the national and State governments as will afford some reasonable guarantee against the continued ravages of this disease. And in view of the prevalence of bovine tuberculosis in foreign countries, and the measures taken by some of them to protect their cattle from further infection, the United States should prohibit the importation of breeding animals until they have been proven by the tuberculin test to be free from this disease.

"The State Secretary of Connecticut made the following report: Mr. President and Members of the United States Veterinary Medical Association. I have the honor to present for your consideration the following report on behalf of the veterinary profession of Connecticut for the year 1895-96:

"The subject of tuberculosis and the use of the tuberculin test as a means of limiting the amount of this disease among our neat stock was also the subject of much debate and contention, the result being that the whole matter was left in the hands of the commissioners, who were given power to quarantine all suspected animals and to make a physical examination of any animal or animals with or without the consent of the owner. The use of the tuberculin test was absolutely restricted to be used only when the owner of the animals requests, in writing, that it shall be employed as a means of diagnosis, and when such owner also executes a written agreement that he will not afterward introduce any untested animals into the herd.

"All animals that are condemned as tuberculous as a result of either of these methods of examination are, after being appraised by agreement between one of the commissioners and the owner, destroyed by the commission, generally at a public slaughter, the owner receiving full agreed value for all animals so appraised and destroyed.

"The Legislature did not make any special appropriation for the work, but gave the commissioners power to draw upon the Treasurer of the State for all necessary funds, provided the approval of the Governor accompanies all such drafts. This law, although incomplete and allowing the commissioners so little control, has so far served as an excellent means of educating the public as to the

value of the tuberculin test and the presence and appearance of tuberculosis.

"There has been a steady increase in the number of applicants for the test, and with the wider knowledge of the facts before them our people are beginning to hold the work of the commissioners in higher esteem and to appreciate more fully the goodness of their work; all of which must eventually lead to the enactment of laws that will better enable the commission to control the spread of this most insidious of all our animal plagues which are communicated to mankind.

"From January 1 until July 15, 1896, 2032 animals were examined, of which 349 were condemned and killed. Since writing this report over 700 animals have been examined.

"The tuberculin test has proved itself to be so reliable and its use has shown itself to be so free from any ill results to healthy animals that a very large number of those who were opposed to its use on purely theoretical grounds have, upon seeing its actual results, become its admirers and firm upholders. One effect of the law so far has been undoubtedly to give a purer milk supply to the urban consumers. In one portion of our State a large creamery association, receiving products from over 1500 cows daily, has refused to take any more milk from cows that cannot show a certificate of having passed a proper tuberculin test.

"Our laws further provide for a quarantine against all cattle entering the State without permit. Upon application permission to enter is granted: 1. To such animals as have been properly tested just prior to seeking entrance, and are so shown to be free from disease. 2. To those that seek entrance for immediate slaughter, which slaughtering must, however, be done in the presence of one of the commissioners. 3. To those who will hold the animals after their arrival until the tuberculin test is applied to them by the commission."

Virginia. The board of health of Norfolk received in private sessions a report from Dr. Faville as to the inspection of the various dairy-herds in the vicinity of that city, all supplying milk to its citizens, and we note in connection with this an advertisement inserted in the papers of Norfolk by those milk-producers who have had their herds tested and who have eliminated all the tuberculous animals. Some of them have adopted monthly inspection, so as to

insure clean and healthy milk to their customers. One of such herds had some nine animals removed from it as tuberculous.

Veterinarian Harbaugh, of Richmond, very thoroughly discussed, in the July *Bulletin* of the Virginia board of health, the subject of bovine tuberculosis as it relates to state medicine. Entering upon the history of tuberculosis from the time of the discovery of tubercular bacilli, he took up the subject of the transmission of tuberculosis from one species of animal to another by association and through feeding-experiments and the exhalations of diseased human subjects to other lower animals. He forcibly calls attention to the danger of leaving tuberculous animals in dairy-herds and to the danger of milk from such sources, and the necessity of the state taking up, through its central and local boards of health, the question of protecting the people from the dangers lying in animal food-products offered for sale on the public markets, without the consumers having any information as to the condition of the animals from a health point of view or to the surroundings and conditions under which these important foods were produced and preserved. Touching upon the point as to the frequency of diseases in thoroughbred or high-bred cattle, he showed that it was not a question of high or low bred cattle, but as to its propagation among herds through the introduction of a single tuberculous animal. In closing his appeal, he quotes the following from Nocards work on animal tuberculosis: "It seems not unreasonable to suppose that the same is the cause for human tuberculosis, and that, if the children of tuberculous parents were protected from infection by cohabitation or ingestion, the importance of heredity as a cause of the disease, or even of the predisposition to it, would dwindle away into insignificance."

A vigorous and unrelenting war should be made against animal tuberculosis as one of the great causes of human tuberculosis, and this war should be a campaign of extermination, as well as of education.

The State of Virginia was also represented.

The veterinarians of the state are actively engaged in a brisk fight against bovine tuberculosis. The disease was fully discussed, after which the following resolutions were passed: "We, the Virginia State Veterinary Medical Association, fully indorse the work being done in this state in regard to the prevention of products of

tuberculous animals being sold as human food; and we desire to inform the public that the tuberculin-test is the only reliable means of diagnosing tuberculosis in cattle; and we further assure the public that when tuberculin is properly used it has positively no deleterious effect on healthy cows or their milk. We further declare that milk or meat from tuberculous animals is impure and unfit for human food, no matter to what extent the animal may be affected. It is the opinion of this association that the National Government should adopt radical methods to exterminate this disease and prevent any more of it being introduced from abroad by the importation of thoroughbred or other stock, and, in the meantime we strongly urge our state authorities to quarantine against other states, and allow no cattle to be shipped into this state for breeding or dairy purposes unless accompanied by a clean bill of health, based on the tuberculin-test, or to have them tested by a veterinarian satisfactory to the board of control at point of entry at owner's expense."

Louisiana. Tuberculosis has been found among the herd of the State Experiment Station, a test revealing six of the herd of twenty-two affected. These latter have been isolated, and, with the healthy ones, will be retested from time to time and the diseased ones returned to the herd only when they cease to react. The calves will be taken from the mothers at birth and fed milk from healthy cows only, to see how thoroughly the disease may be eradicated by this system (Professor Bangs), and thus avoid the great pecuniary loss to the station. All of the cattle responding were well bred, and among those purchased native cattle seem to have a greater immunity from the disease. A test of the relative percentage of butter-fat present in some nine of the animals before and after injection proved interesting. The variations were quite marked, in some instances as much as 2.8 per cent. But one cow, a Jersey, presenting generalized tuberculosis, was destroyed, and the carcass cremated. Disinfection of premises will be carried on at regular intervals.

St. Louis is much agitated over the inspection of the cattle furnishing the milk supply of the city, and all sorts of rumors are floating about. The herd at the city's poor farm, largely Holstein in breed, exhibited twenty-two out of twenty-eight with tuberculosis under the tuberculin test. State Veterinarian White and Dr. Ellis, City Inspector, are giving the matter almost their entire attention.

The lack of a compensating clause to the owners for animals condemned and destroyed is creating much opposition. Deaths among children from tuberculosis and intestinal troubles have been very numerous throughout the city, and the milk supply is charged with a great deal of responsibility therefor. The state and city boards of health are working together in this movement and are very determined.

California. Riverside, through its health officers, has taken up the inspection of the dairy herds with a view of eliminating all tuberculous animals. The *News* calls upon every citizen to assist in the crusade against tuberculosis in dairy cows, by refusing to buy milk unless the dealer can display a clean bill of health, which advice other journals in all cities might give to their readers.

"Peddlers of Poison" is the headline of the *News*, of San José, in speaking of dispensers of milk from tuberculous herds. Veterinarian Spencer reported 892 cattle examined; 225 condemned from March 20 to July 1, 1896. In July 421 tested; 150 reacted. A similar percentage throughout the counties would show 1675 diseased in a total of 8,377 kept as recorded by assessors' books. Tuberculosis in California, from July, 1894, to July, 1895, stands at the head of the death list; 1,789 being recorded from this cause out of a total death list in the state of 11,349. Due credit was given the veterinarian at a meeting in San José for enlightening the public on this all-important question.

Tuberculosis is very prevalent throughout the state. Some herds of dairy cows that have been subjected to the tuberculin test have shown 70 to 75 per cent. of them to be affected. Tuberculosis is also very prevalent among hogs raised and fattened on milk, or, as they are called here, dairy or milk hogs.

New York. The New York *Times* in commenting editorially upon the fact that only the cattle of New York county would be examined with tuberculin, while the city's milk-supply came almost wholly from outside, owing to the parsimony of the State legislature, says the work of inspection throughout the State has been suspended in the face of the unanimous recommendations of the State and many local boards of health and a general demand from the public that they be given greater security from the dangers of this source of their food-supply. It highly commends the work done in Massachusetts, and refers to the other states of Connecticut, New Jersey,

and Pennsylvania, which are doing like work. Further, that the time is coming when all the dairy-herds in the New England and Middle States will be subjected to the tuberculin-test, for the protection of consumers of dairy products as well as for the benefit of the owners of cattle. We expressed this opinion some years ago, and it has been confirmed by what has taken place since that time. If State legislatures refuse to provide for the work, the cities will require it to be done throughout their suburban "milk-districts" for the protection of their inhabitants. This State might have been foremost in the movement, but now it lags behind all its neighbors.

The Health Department of New York City, between July 31st and September 14th, inspected 153 cows, 28 of which were found to be tuberculous and were destroyed. One hundred and seventy-eight families, or about five hundred persons, received milk from these animals. It is expected that the work will require a period of five or six weeks to cover the entire State, in which there is estimated to be 2,500 cattle; the number already tested is 2,147, of which 405, or nearly 20 per cent., were condemned. The quality of the food and water supply to the cows of New York City is also being examined into at the same time.

Tuberculosis has caused 61,155 deaths in the human family in the last ten years in the city of New York.

Illinois. Forty of the herd of cows at the Kankakee Asylum were recently ordered destroyed on account of being tuberculous by Veterinary Trumbower.

New Jersey. "Recent legislation gives local boards of health the power to appoint a veterinary inspector. Many of the Boards of Health have already appointed their veterinarians, and this addition cannot help but be a very essential requirement from a sanitary standpoint.

The general oversight of contagious diseases comes under the State Board of Health, which has done much affective work through its veterinary inspectors. The only contagious disease that has been taken out of its hands is bovine tuberculosis. A recent Legislature passed special legislation to protect the public health from this disease, and provided for the appointment of a State tuberculosis commission, which is doing effective work.

Herds of dairy cattle in different parts of the State have been inspected and the tuberculin-test made. Diseased animals have

been paid for by the State, at the rate of three-fourths their appraised value.

In proportion to the population and area, New Jersey has her share of veterinarians, and I am proud to say has among the number many distinguished and successful practitioners, but unfortunately there is not a proper State organization or society. I believe there are two associations, both claiming to be regular State organizations.

"The newer society is exclusive and admits only college graduates, while the membership of the older society is made up of both graduates and non-graduates. The societies are antagonizing each other, to the detriment of both, and in this way have lost a certain amount of prestige. As I see it, no effective work can be accomplished until both factions are brought together and an amalgamation effected. This, it seems to me, might be done on a satisfactory basis to both parties, inasmuch as we have now a State law regulating the practice of veterinary medicine and surgery.

"This law recognizes two classes of practitioners, viz., the college graduates or regulars and the non-graduates or 'existing practitioners,' as they are termed in the statute. These 'existing practitioners' are those men who practised veterinary medicine and surgery for five years before the passage of the law without a diploma and registered within six months after the approval of the act by the Governor. Now, if both societies would amalgamate and incorporate into a regular State organization, admitting all licentiates, both graduates and non-graduates, I think everything would work all right. The graduates are in the majority, I think, and if not they soon will be, for new members can now only enter practice in our State as graduates."

WHAT WILL OUR ANSWER BE?

France, in April last, notified this country that it would not permit imports of cattle to that country without subjecting them to the tuberculin test. That government has also provided for the sanitary inspection of all cattle owned and kept in France. The action of France, Germany, and Italy, in adopting measures to protect their flocks from tuberculosis, will no doubt be followed by Great Britain and other countries. Should the latter nation take similar steps, it will mean an additional restriction upon the expor-

tation of cattle from this country, and few of our states, particularly our great western reserve, are in position to defend themselves from this restriction. True it is that those sections of our country are literally free from tuberculosis among the cattle, but this will scarcely give them protection from such proposed measures. Those who have looked upon the means adopted in Massachusetts, Maine, New York, Connecticut, and other states as oppressive and too radical, will soon realize that they must follow the same course. We do not want other countries to send us more tuberculosis than we have, and they are perfectly justified in not wishing any greater amount to deal with than they have at home. We have no disposition to question the wisdom of these measures in other countries, and America must meet them by unquestioned evidence that we are sending them cattle free from tuberculosis, just as we can assure them of our freedom from contagious pleuro-pneumonia.

VALUE OF TUBERCULIN TEST.

Annual report of the Cattle Commission of Connecticut. The document presented to the Legislature yesterday contained much of interest—Total of 6304 animals examined for tuberculosis during 1896.

The annual report of the Connecticut cattle commissioners was presented to the Legislature yesterday. They have examined 6304 animals for tuberculosis during the year, and condemned 897, of which 878 showed the disease on autopsy. They locate the disease in the carcasses as follows: Retro-pharynegal glands, 15.4 per cent; mesentorie glands, 32.7 per cent; portal glands, 11.5 per cent; liver, 60.7 per cent; peritoneum, 49 per cent; uterus, 3 per cent; lungs, 78.4 per cent; bronchial glands, 34.3 per cent; mediastinal glands, 57.1 per cent; udder, 7 per cent; pleura, 38.4 per cent.

They call attention to a somewhat curious fact touching the location of the lesions. While they may occur in every part of the body, there is a seeming tendency for the same part to be affected in the same herd. For instance, in one herd the throat may be the part, and nearly all the infected animals be found with lesions in that region. In another herd it may be the peritoneum or liver where the tubercles are mostly located.

They have tested 614 herds, of which 344 were found to be clean. In the 897 cattle killed the post mortem revealed 146 very bad cases, 640 well marked cases, 85 light cases, breaking down of tissue, but no caseous deposit; 19, no lesions found by the unaided eye.

They say that the teachings from authorities like Dr. Salmon, emphasized by the experience of those who have used the test, are having their legitimate effect upon the farmers in the state. Apathy and even hostility are changing into willingness, and often eagerness, to have their herds examined with tuberculin. The changing drift of sentiment is graphically indicated by the steady and remarkable increase almost every month during the year in the number of cattle examined.

Out of 84 animals examined physically without tuberculin 28 were condemned, and of these five were found by the post mortem examination to be free from tuberculosis, an enormously larger percentage of error than in the tuberculin examinations.

They declare that tuberculosis can be stamped out, for, though the disease may be incurable in the individual animal, yet every member of the commission feels that his own herd can be freed from it and what he can do others can till the disease disappears.

In discussing the infection of milk they say: This risk of feeding stock with products of the creameries is one that we are led to believe exists, and we think it would be a wise and timely precaution if all such products were sterilized before being fed. The conclusion that milk in any degree is a source for infection with tuberculosis is so important that it must of necessity be the keynote of the campaign against the disease. A food almost universally used must be freed from even the suspicion of taking into the system along with it the germs of a disease which, the world over, is responsible for eight per cent of all deaths of human beings.

The total expenses of the commission for the year have been $31,667.73.

FROM GOV. WALCOTT'S INAUGURAL.

"I commend to the most careful consideration of your honorable bodies the question of the eradication or limitation of this disease in cattle. The conditions affecting its presence in cattle and its transmission to man are to be determined by scientific investigation, and in the countries of Europe, as well as in our own land, are better understood than when the danger was first realized. There can be no doubt that in the advanced stage of the disease, especially when it has attacked the udder, the milk as well as the meat of the animal so diseased may convey the tubercle bacillus, and therefore become a grave danger when taken into the human system. If sterilization were universal, the danger from milk so affected would be removed. In the earlier stages of the disease, the danger is regarded by many competent authorities as slight, but it must be remembered that the tendency of the disease is constantly to advance. The existing law restricts the use of tuberculin to cattle brought into the commonwealth from any point without its limits, and to cattle held at certain quarantine stations, but provides that it may be used, on the consent in writing of the owner, upon animals in any other portion of the state, and upon animals condemned as tuberculous upon physical examination.

"This restriction expires by limitation on the first of June, 1897. The community is yearly becoming better informed on this subject, and therefore better prepared to adopt measures which shall be inspired neither by an exaggerated alarm on the one hand nor on the other hand by an unreasoning opposition to necessary sanitary precautions. With the co-operation of local boards of health and with the dissemination of accurate information on the subject by the board of agriculture and other agencies, it may be expected that the action of the state will be re-enforced by the normal, healthy pressure of customer upon dealer, in demanding a general improvement in the sanitary condition of dairies, and their immunity from this dread disease through the application of this test, undoubtedly the most reliable yet discovered. Whatever general line of policy your wisdom may adopt, I ask you to consider two suggestions: Is it right or wise that, as now, the state should pay full value for animals that have reached the most advanced stage of general tuberculosis and udder tuberculosis? Such animals should be sought out by means of a thorough, periodic inspection, and

slaughtered as being not only worthless, but a source of danger to the rest of the herd as well as to the community. At present the owner has no motive to check the disease in its earlier stages. If compensation were graded according to the condition of the animal as revealed by autopsy, the owner would have a direct interest in purging his herd of infected animals before they become worthless. Secondly, I think the commissioners should in any event have sufficient means at their disposal to enable them to test with tuberculin all cattle the owners of which request such inspection."

FROM MASSACHUSETTS COMMISSIONERS REPORT, 1896.

The report discusses the importance of the control of animal diseases and recognizes the antagonistic interests involved. To illustrate the subject, the details of the testing and retesting of several herds are given, with particulars of the surrounding sanitary conditions. The conclusion is that it requires not one examination alone, but more than one test, and thorough disinfection and renovation before a herd can be pronounced free from disease.

The report also discusses the destruction of carcasses affected with tuberculosis, and expresses the opinion that carcasses but slightly affected, if in other conditions fit for food might be used for food, under a proper system of inspection.

In the inspection of herds the report insists that the udder should have especial attention, with prompt quarantine where any abnormal condition is found. It expresses the opinion that if all advanced cases are condemned, and the milk supply is obtained only from such animals as are in good general health and show no physical evidence of disease, the danger is very much reduced. It believes that there is no need for the adoption of more radical methods at the present time, and, further, that advances can be made in other directions which will give better protection to the public, and result in great and immediate benefit to both producer and consumer. It declares that cholera infantum in children is not a tuberculous disease, but is due to fermentation and the presence of impurities and immense numbers of bacteria in the milk. The disease is preventable, and is due to uncleanliness and filthy surroundings, and to want of attention in the care of milk. In this connection the report has urgent advice to milk producers and handlers looking to better sanitary conditions.

During the year the board has had at its disposal $300,000. It has paid for 5,198 head of cattle condemned as tuberculous, the sum of $173,206.35. There are in hand 550 warrants for cattle to be killed, the value amounting to $16,040.25. There has been paid for quarantine expense $28,223.43, making a total of $217,-470.03 returned to the cattle owners of the commonwealth.

The board expects soon to remove its headquarters to the State House, thus reducing administrative expenses. It is of the opinion that such laboratory work as will be necessary in the future can be accomplished with comparatively slight expense.

In closing, the board says it is convinced that the restrictions against the testing of herds upon the request of the owners, which was a provision of the bill of last year making the appropriation for the board, should not be re-enacted. The board should have power to do this work, wherever owners will bind themselves to follow it by a strict compliance with the sanitary regulations of the board.

STATISTICS OF THE DAIRY FOR 1895.

At the close of the year 1895 the cows which may properly be regarded as dairy animals constitute about one-third of all the neat cattle in the United States, and are about 17,000,000 in number. Dividing these roughly according to their principal products, it may be considered that 11,000,000 cows are primarily butter producers, 1,000,000 cows produce all our cheese, and the milk from 5,000,000 cows is consumed by the families of their owners, or on the farms where produced, or is sold to be consumed as milk, fresh or condensed. These estimates, with products and values added, may be tabulated as follows:

Cows.	Product.	Rate of product.	Total product.	Rate of value.	Total value.
Millions:					
11	Butter...	125 pounds..	1,375,000,000 lbs ...	20 cents.	$275,000,000
1	Cheese ..	280 pounds..	280,000,000 lbs ...	8 cents.	22,400,000
5	Milk	350 gallons..	1,750,000,000 gals ..	9 cents.	157,500,000

This gives the grand total value of the dairy products of the country as $454,900,000. If to this be added the skim milk, buttermilk, and whey, at their proper feeding value, and the calves

yearly dropped, the annual aggregate value of the products of our dairy cows exceeds $500,000,000. This is regarded as a conservative estimate, and does not include the manure product, which has a very large but quite uncertain value.

If the value, per head, estimated for cows in this country, viz., $22 to $25, is accepted, these animals produce nearly 50 per cent more than their own value, annually. But there is an old farm rule, which has reasonable basis, that a cow is worth whatever she will produce in a year, including her calf. At this rate the average value of the dairy cow in the United States must be about $30.

The foregoing estimates are based upon an average yield of 350 gallons, or about 3,000 pounds of milk, yearly by each cow. This is rather more than shown by the census tables, but those exclude the large number of town cows, which would materially raise the average milk product. This rate of yield provides for butter and cheese product estimated and for consumption, besides the skim milk and buttermilk residue from the butter cows, about 25 1-2 gallons of whole milk per annum per capita of our population. Two hundred and twenty pounds of milk for 365 days (rather more than one-half pint a day) is by no means an excessive allowance, but many people do not, in fact, approach that rate of consumption.

NEEDED IMPROVEMENT IN DAIRY CATTLE.

Assuming that the different products of the average dairy cow in America do not exceed much, if at all, the foregoing estimates, it is evident that the average cow of the country is far below a standard which is desirable and entirely practicable. The tables show that there has been a gradual improvement in the average cow product, especially during the last two or three decades. But the progress is by far too slow.

A very good annual average yield of milk is 5,000 pounds, instead of 3,000, and 200 to 225 pounds of butter per cow, instead of 125 pounds. Many herds kept in a plain, practical farm fashion attain still better results. There are manifestly many cows in the country, probably some millions, that do not produce the value of their annual cost, however cheap and wastefully poor their keeping may be. It is apparent that if but two cows were kept, of the suggested standard of production, in place of every three of the existing average quality, the aggregate products of the dairy industry

of the country would be increased more than 10 per cent, while the aggregate cost to their owners ought to be less, and probably would be.

Every possible influence should be exerted to induce dairy farmers to weed out their herds and keep fewer cows and better ones. At least, the average quality of cows kept for dairy purposes should be brought up to a respectable and profitable standard. For the present the cow owner may reasonably require something over 2 gallons of milk per day for four months, then 2 gallons a day for the next four, and at least two months more in milk during the year, with constantly decreasing yield. This provides for an annual average yield of 5,000 pounds of milk, or about 575 gallons, which is a fair ideal standard for the dairy cow in the United States.

DISINFECTION OF STABLES.

By VICTOR I. SPEAR, Cattle Commissioner of Vermont.

For this occasion I shall assume that we all believe tuberculosis to be an infectious disease, and that we also believe that the germs of the disease will remain for an indefinite time in stables or apartments where there has been a case of the disease, and be a perpetual menace to the health of either persons or stock that are brought in contact with them. This being the case, the great necessity of thorough disinfection cannot well be overestimated, and my purpose at this time is not to present rules for doing this work, or to advocate a particular method, but rather to suggest some means that are in use, to mention some of the difficulties in the way of doing thorough work, and leave the matter for discussion.

The disinfection of stables we find to be much more difficult than to disinfect a house, from the fact that stables are found constructed under every possible condition. Where they are so constructed that they can be closed tightly, or if we can be sure of reaching every part that has been exposed to disease, we can feel reasonably sure of rendering such a stable safe. In actual work we find but few stables that correspond with our ideal in this respect; we find them in basement cellars, where the space in front of or behind the cows is open, and there is a large space either filled with manure or which has only an earth floor. Stone walls upon

which the barn rests are the boundaries in some directions and rough boarding in others; often the hog-pens are adjacent to the cow stables, and sometimes the stables for horses. In other cases we find stables which open in front of the feeding manger into barn floors, and thence to the hay mows and all portions of the barn; some are found rough boarded, with large cracks that open not only to the outside air (which would do no harm for this purpose,) but also open into horse stables, calf-pens and all portions of the building. If the claims made by newspapers where tuberculosis first came to be talked about, and by some of them yet, that the disease would only be found in fancy herds and under hot-house conditions, etc., were true, we could simplify the matter of disinfection very much, as it would give good stables to operate on. As a matter of fact, we find the disease as often under circumstances that indicate neglect, as in the herds of the careful farmer, and the experience we have so far had gives little encouragement to those who have proposed to protect themselves from the disease either by a process of freezing or starvation. In view of the many unfavorable conditions which we meet in the construction of stables, we feel that only the smaller half of our work has been done when a diseased herd has been tested and the diseased animals destroyed; the larger and more difficult half of the work remains in making the stables safe for the future. We have found such conditions in a few cases that we did not feel competent to advise any adequate means except to vacate the old stables and build one entirely removed from the cause of disease. Under circumstances so varied the remedy must often be made to suit the individual case. Fortunately, enough has been learned of the character of the tubercle bacillus to prove that it is not difficult to destroy if it can be reached; poison, heat and bright sunlight all seem to destroy it, and this gives into our hands several agencies with which to combat it.

DISINFECTANTS.

The most natural and cheapest means of disinfection is fresh air and abundant sunlight. In stables that are well lighted and the supply of fresh air is abundant, we have found that the progress of the disease has been very slow. I have in mind two cases that have come under my observation. In the one case a herd of forty cows were examined, where the owner assured us he had the disease, and was sure he had had it for three years, having killed a

cow three years before that was badly diseased. Six cases were found; four proved to be in stock that the man had bought three years before from herds that have proved tuberculous, and were evidently cases of long standing; the other two cases had developed in the herd. The conditions found here were a large, high, well-ventilated stable, with windows upon three sides, and as good sanitary conditions as could be often found. Another case was a stable of twenty-seven animals with only one window to light it, and it was hardly over six feet high and possibly ten feet wide, and closely shut up. Twenty-four of the twenty-seven animals were found diseased, and investigation showed that the disease had probably come into the herd three years before in the purchase of a certain cow. These are the two most marked cases that have come within our experience, but nearly all of our work has confirmed in a less degree what is here indicated. Although I believe that the disease is always the result of infection, and never originates in a herd in consequence of poor sanitary conditions, I also believe just as fully that its progress through a herd will be in proportion to the good or poor conditions which it finds; and we can scarcely urge too strongly upon the owners of herds the necessity of abundant sunlight and fresh air. I have placed sunlight and fresh air first among disinfectants because they should be in use always, and the temporary means employed are only for an emergency and to help for a certain time. All persons who buy and sell stock are liable under the best conditions to get a tuberculous animal into their herd at some time, and attention to proper stables will very much lessen the danger if this should happen. As temporary means of disinfection we have usually used a solution of corrosive sublimate, giving all portions of the stable and adjoining woodwork a thorough wetting down, after there has been a thorough cleaning out, sweeping and washing. No bad results have occurred in using this preparation, and so far as we can judge at present it has been very effectual. When a stable can be closed tight we have had sulphur burned, and where it is possible to get boiling water or hot steam upon the germs it is a good disinfectant. The only objection to the use of steam or hot water is the difficulty of getting a sufficient quantity and applying before it loses its high temperature. In the use of any poison there is a possible danger of using an excess and of its forming in puddles where stock will get injured from lapping it up. We have never had any such result in our work, and with

a fair amount of care it does not seem to be a very dangerous method of disinfecting. From our standpoint it does not seem impossible to eradicate tuberculosis from the herds of our States. The evidence so far in the case goes to show that it has not been with us for any considerable time, and we fully believe it to be an imported article. The belief that has been somewhat general that it has been here as long as cows have, and that all the old cases of coughing cows were tuberculous, seems to be a belief without any evidence. I have met many old men who have assured me that they had a case of tuberculosis fifty years ago, and have never had a case since. Tuberculosis does not have that kind of a history, and I have found but very few places where a person had ever had a case in his herd and got rid of the disease until tuberculin was used for its detection. Another reason why I feel certain that tuberculosis has not been very long in this country is that only a few herds have any of the disease to-day, and with the infectious character which it possesses, had it been here as long as is claimed by some, no herd would be exempt. So, believing it to be practical to suppress and exterminate the disease from our herds, I attach great importance to the matter of disinfecting thoroughly wherever the disease has been found; and wherever we find the disease we recommend the second test of such herds after a period of six months or a year in order to make certain that nothing has been overlooked or sprung up since the first test was made. If this precaution is taken, we believe that a herd once free from the disease will always remain so unless it is brought in from some outside source.

TUBERCULIN.

By C. M. WINSLOW, Cattle Commissioner of Vermont.

That the immortality of man can be perpetuated only through the dissolution of the body has never been an accepted solution of the problem of life, and man's most earnest efforts have ever been put forth to prolong to the utmost the period of his earthly existence.

The old story of Alchemist in search of the elixir of life, and his, for a time, successful efforts to compound a mixture that should rejuvenate the body, is only a fanciful way of stating the daily efforts of our physicians to discover some remedy that shall enable them to hold in check the wasting of the tissues, and nullify the germs of decay in the human body. It was in the prosecution of these efforts that the French and German scientists and physician discovered that the fatal and much-dreaded disease, consumption, was due to the presence in the system of a germ, and also led to the discovery by Professor Robert Koch, of what he supposed to be its certain cure, namely, tuberculin.

This germ theory of disease has caused a new departure in science, and from the discoveries have been evolved a series of toxic remedies which give promise of revolutionizing the method of treatment of several of our most dangerous diseases.

In the bacterial growth of different kinds of germs there is formed an alkaloid, or ptomain, peculiar to the species which developed it. Tuberculin is the alkaloid, or ptomain, obtained by growing the tubercle bacillus in pure culture, until a great quantity of highly concentrated ptomain is obtained. Glycerine and carbolic acid are then added, and the mixture heated to 225 degrees. It is then filtered by pressure through a porcelain plate to remove the germs, and again heated to 225 degrees, and evaporated at a low temperature, until sufficiently concentrated.

The German tuberculin is put up in a highly concentrated form, and needs to be reduced before using; the tuberculin manufactured by the Bureau of Animal Industry is put up in 12 c. c. bottles, and is ready for use without diluting.

The only way that the injection of tuberculin into the living body could be instrumental in planting the disease by inoculation would be where the tuberculin contains some of the living germs, left

there accidentally in its preparation, but when prepared in the manner just described, there would seem to be no possible way for any life to be remaining in it.

The tuberculin test, as it is called, is a scientific use of the thermometer in revealing the effect of a small amount of tuberculin injected under the skin of the animal. The animal should be subjected to a careful physical examination, to see if it has tuberculosis in its advanced stages in the lungs or visible glands, or, that its general animation would indicate probable tuberculosis, for it sometimes occurs that an injection of tuberculin has no effect in causing a rise of temperature in an animal whose system has been thoroughly permeated with the natural ptomains from advanced tuberculosis; and the tuberculin test is unnecessary to detect the disease that is so plainly discernible without the aid of science.

The temperature of the animal should be taken two or three times at intervals of one or two hours, and if the thermometer indicate the normal temperature to be from about 99 to 103 degrees it will be safe to give the injection, but if the thermometer indicate a higher temperature, from 103 to 104 degrees, it is best to postpone the test until the temperature of the animal returns to normal, for a test under such conditions would be unsatisfactory because it would be doubtful, the high temperature indicating an abnormal condition of the animal from some unknown cause.

The hair should be shaved from a small place on the shoulder or neck of the animal where the skin is thin, and this place should be washed with some disinfectant. With a sterilized hypodermic syringe, an injection of from 1 c.c. to 3 c.c. of tuberculin (diluted) should be thrown under the skin.

Tuberculous animals should show a rise of temperature, beginning usually in from six to ten hours after injection, continuing to rise for from eight to twelve hours longer, and then declining to normal. A uniform and steady rise of two degrees is ground for suspicion, unless there be some explainable cause, like being in heat, or being near calving, or some change in condition or surroundings; and a rise of three or four degrees, if it is uniform and regular, with no apparent conditions to cause it, is sufficient cause for condemnation under the tuberculin test, and the animal should be slaughtered, and a post mortem examination made.

The tuberculin test is an expert test, new within a few years. It has been severely criticised, and its results closely watched by those ready to oppose its use.

It would be very singular if so delicate a test, one so essentially scientific, should not sometimes be misleading in the hands of ignorant or careless men.

I believe it to be the only sure diagnostic test for incipient tuberculosis, and a perfectly reliable one in the hands of a skillful and careful veterinarian. Within the last year or two, it has been thrown into the hands of men who know nothing of its use, careless and inexperienced men, many of them, and still the enemies of the tuberculin test have found but few mistakes made, even in inexperienced hands. I have never heard of a case where injurious effects from the use of tuberculin were reported, that similar conditions might not have prevailed in the animal, had it never been tested. I have investigated many such reported cases, and in the majority of instances have found no just reason for laying the trouble to the effect of the tuberculin test.

If a cow has been tested, and afterward does not do well, it is attributed to the tuberculin. A cow that has never been tested sometimes does not do well after calving, but if she has been tested and then does poorly, the tuberculin is responsible for her condition. I have found trouble where the person operating was careless and slovenly in the care of his syringe, or failed to properly disinfect, but never when proper caution was exercised.

We have on record cases where cows have been subjected to the tuberculin test every six months for nearly four years, with no bad results as yet, and I do not know of a single case of injury to a cow chargeable to the use of tuberculin. One claim against tuberculin was that the cow tested swelled at the point of injection, the swelling extending to the top of the neck. Undoubtedly this was a case of blood-poisoning, due not to the tuberculin, but to a careless operator, who had not properly cleaned his syringe.

Another cow was said to have dropped off in her milk, and gone dry after the test. If the cow had not been injected we could have found various reasons for the trouble, since cows that have never heard of the tuberculin test have shown a marked proclivity for doing this very thing.

Other cases are reported in this same line, not, we think, due to tuberculin.

Tuberculin has been used in Vermont as a diagnostic test for nearly two years, with no bad results as yet. Of the animals tested and killed in my district, which is the western half of the

State, we have made not one mistake in condemning animals that reacted from the tuberculin test, as upon a post mortem examination, in each animal the disease has been plainly visible to the naked eye. I was myself, in the beginning, skeptical in regard to its value, but my experience in its use has given me full faith in finding the disease, and condemning and slaughtering animals by the tuberculin test, since I have never found it to fail.

It has been known for many years that tuberculosis was prevalent among the herds of cattle in western Europe, and was being brought here in the cattle that come to this country. It was also known that it was in certain breeds of cattle and families of those breeds, and it was considered ruinous to a herd of cows if it once obtained a foothold, for there was no way to detect it until it reached its advanced stages. The only way to get rid of it was to exterminate the herd, and by post-mortem examination learn too late which individuals should have been killed, and which spared, making it expensive and unsatisfactory. The knowledge of its contagious properties in the herd, power of being transmitted to the human family, came to light just before the discovery that tuberculin could be used as a diagnostic test. It had been hoped that tuberculin would prove a cure for consumption in the human family, but was sorrowfully found to be a failure, in that it stirred up and excited the disease, and set it actively to work. The reason for its failure in the human family, however, is its chief recommendation for use among animals.

In the human family we wish to prolong life in the diseased body as long as possible, even though we know a cure is impossible, but with animals it is different. Disease should be eradicated that we may save only the strong and well, and since it is known that there is more or less danger to the human family from using the products of tuberculous animals, should not any remedy that will enable the owner to weed out the animals that are a menace to the public health be hailed as a great blessing, and universally welcomed and adopted? Are the lives of many animals to be compared to that of one man? Supposing the tuberculin test was successful in only half the cases, would it not be of inestimable value in thus much lessening the sources of disease and death in the human family?

But when the mistakes are less than 1 per cent, and that too where so delicate a test is often placed in inexperienced hands, it

should remove all prejudice and opposition, and be accepted by all classes as the most wonderful gift of modern science, not only to the dairyman, but through him to the public generally. Through its instrumentality the breeder may be certain that he has only healthy animals in his herd, and the public rest content that they are not taking in through the medium of the dairy products, which form so large a part of their daily food, the germs of that most insidious and deadly of diseases, tuberculosis.

NOTICE OF QUARANTINE.

TO WHOM IT MAY CONCERN.

Public notice is hereby given, that in consequence of the prevalence of tuberculosis among Massachusetts cattle, as disclosed by the official reports of their authorities, supplemented by post mortems held in Maine of cattle purchased in that state for dairying and breeding purposes, the Cattle Commissioners of the State of Maine believe that the public health of its citizens and the welfare of this commonwealth demand that a rigid quarantine (against all cows whether in milk or dry, and all bulls for breeding purposes) be maintained on and after January 1, 1892, until further notice, and all such cattle entering the State of Maine thereafter will be subject to quarantine at the owner's expense; provided, however, that the above regulations shall not apply to Western cattle coming through Massachusetts into Maine for the purpose of slaughter.

The attention of all persons is directed to sections 2, 3, 4, 5 and 7, of chapter 138, of the Public Laws of Maine, 1887, applying to cattle affected with contagious diseases, and which will hereafter be rigidly enforced.

[Signed] JOHN W. DEERING, SACO, *President.*
F. O. BEAL, BANGOR, *Treasurer.*
GEO. H. BAILEY, DEERING, *D. V. S.*

A quarantine station will be provided near Morrill's Corner, Deering, where all cattle brought into Maine in violation of the above notice will be kept until discharged, at the expense of the owner or owners; and particular attention is called to the full reprint of the law relating to contagious diseases upon the following pages of this circular-letter, which will be rigidly enforced after this date.

PORTLAND, January 1, 1892.

NOTICE OF QUARANTINE.

The Cattle Commissioners of the State of Maine, having found from recent experience that it has become absolutely necessary to supplement our former notice of quarantine issued January 1st, 1892, so that it shall include not only Massachusetts, but all other states, order that no cattle for dairy or breeding purposes shall be brought into this State either by road, water, railroad or other conveyance until further notice; and all such cattle entering our State, without a permit signed by some member of our Board will be subject to quarantine at the owner's expense, and the attention of all persons is directed to chapters 177 and 194 of the Public Laws of Maine, which will hereafter be rigidly enforced.

JOHN W. DEERING, SACO, *President.*

F. O. BEAL, BANGOR, *Treasurer.*

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

LAW RELATING TO CONTAGIOUS CATTLE DISEASES AS AMENDED IN 1889.

CHAPTER 177.

An Act to Extirpate Contagious Diseases Among Cattle.

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

SECT. 1. That for the purpose of facilitating and encouraging the live stock interests of the State of Maine, and for extirpating all insidious, infectious and contagious diseases, now or that may be among cattle and other live stock, and especially tuberculosis, the governor of the State is hereby authorized and required, immediately after the passage of this act, to appoint a board of cattle commissioners consisting of three persons of known executive ability, who shall be charged with the execution of the provisions of this act, and who shall be known and designated as the State of Maine Cattle Commission and whose powers and duties shall be those provided for in this act, and whose tenure of office shall be at the option of the governor. The compensation of said commissioners shall be at a rate of three dollars per day during the time they are actually engaged in the discharge of their duties as commissioners. The said commissioners shall respectively take an oath to faithfully perform the duties of their office, and shall immediately organize as such commission by the election of one of their number as president thereof, and proceed forthwith to the discharge of the duties devolved upon them by the provisions of this act.

SECT. 2. That it shall be the duties of the said commissioners to cause investigation to be made as to the existence of tuberculosis, pleuro-pneumonia, foot and mouth disease, and any other infectious

or contagious diseases. And such commissioners or their duly constituted agent are hereby authorized to enter any premises or places, including stock yards, cars and vessels within any county or part of the State in or at which they have reason to believe there exists any such diseases, and to make search, investigation and inquiry in regard to the existence thereof. Upon the discovery of the existence of any of the said diseases, the said commissioners are hereby authorized to give notice, by publication, of the existence of such disease, and the locality thereof, in such newspapers as they may select, and to notify in writing the officials or agents of any railroad, steamboat or other transportation company, doing business in or through such infected locality, of the existence of such disease; and are hereby authorized and required to establish and maintain such quarantine of animals, places, premises or localities as they may deem necessary to prevent the spread of any such disease, and also to cause the appraisal of the animal or animals affected with the said disease, in accordance with such rules and regulations by them as hereinafter authorized and provided, and also to cause the same to be destroyed, and to pay the owner or owners thereof one-half of their value, as determined upon the basis of health before infection, out of any moneys appropriated by the legislature for that purpose; provided, however, that no appraised value shall be more than two hundred dollars for an animal with pedigree recorded or recordable in the recognized herd-books of the breed in which the animal destroyed may belong, nor more than one hundred dollars for an animal which has no recordable pedigree; provided, further, that in no case shall compensation be allowed for an animal destroyed under the provisions of this act, which may have contracted or been exposed to such disease in a foreign country, or on the high seas, or that may have been brought into this State within one year previous to such animals showing evidence of such disease; nor shall compensation be allowed to any owner who in person, or by agent, knowingly or wilfully conceals the existence of such disease, or the fact of exposure thereto in animals of which the person making such concealment, by himself or agent, is in whole or part owner.

SECT. 3. That the said commissioners are hereby authorized and required to make record, and publish rules and regulations providing for and regulating the agencies, methods and manners of con-

ducting, and the investigations aforesaid, regarding the existence of said contagious diseases; for ascertaining, entering and searching places where such diseased animals are supposed to exist; for ascertaining what animals are so diseased, or have been exposed to contagious diseases; for making, reporting and recording descriptions of the said animals so diseased or exposed and destroyed, and for appraising the same, and for making payment therefor; and to make all other needful rules and regulations which may, in the judgment of the commissioners, be deemed requisite to the full and due execution of the provisions of this act. All such rules and regulations, before they shall become operative, shall be approved by the governor of Maine and thereafter published in such manner as may be provided for in such regulations; and after such publication said rules and regulations shall have the force and effect of law, so far as the same are not inconsistent with this act and other laws of the state, or United States.

SECT. 4. That any person or persons who shall knowingly and wilfully refuse permission to said commissioners, or either of them, or their duly constituted agent to make, or who knowingly and wilfully obstructs said commissioners, or either of them, or their duly constituted agent in making all necessary examinations of, and as to animals supposed by said commissioners to be diseased as aforesaid, or in destroying the same, or who knowingly attempts to prevent said commissioners, or either of them, or their duly constituted agent from entering upon the premises and other places hereinbefore specified where any of said diseases are by said commissioners supposed to exist, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, or of either of the acts in this section prohibited, shall be punished by fine not exceeding one hundred dollars, or by imprisonment, not exceeding ninety days, or by both fine and imprisonment, at the discretion of the court.

SECT. 5. That any person who is the owner of, or who is possessed of any interest in any animals affected with any of the diseases named in section two of this act, or any person who is agent, common carrier, consignee, or otherwise is charged with any duty in regard to any animal so diseased, or exposed to the contagion of such disease, or any officer or agent charged with any duties under the provisions of this act, who shall knowingly conceal the existence of such contagious disease, or the fact of such exposure to said con-

tagion, and who shall knowingly and wilfully fail, within a reasonable time, to report to the said commissioners their knowledge or their information in regard to the existence and location of said disease, or of such exposure thereto, shall be deemed guilty of a misdemeanor, and shall be punishable as provided in section four of this act.

SECT. 6. That when the owner of animals, decided under the provisions of this act, by the proper authority, to be diseased, or to have been exposed to contagion, refuses to accept the sum authorized to be paid under the appraisement provided for in this act, it shall be the duty of the commissioners to declare and maintain a rigid quarantine as to the animals decided, as aforesaid, to be diseased or to have been exposed to any contagious or infectious disease, and of the premises or places where said cattle may be found, according to the rules and regulations to be prescribed by said commissioners, approved by the governor, and published as provided in the third section of this act.

SECT. 7. That no person or persons owning or operating any railroad, nor the owner or owners, or masters, of any steam, sailing, or other vessels, within the state, shall receive for transportation, or transport from one part of the state to another part of the state, or to bring from any other state or foreign country any animals affected with any of the diseases named in section two of this act, or that have been exposed to such diseases, especially the disease known as tuberculosis, knowing such animals to be affected, or to have been so exposed nor shall any person or persons, company or corporation, deliver for such transportation to any railroad company, or to the master or owner of any vessel, any animals, knowing them to be affected with, or to have been exposed to, any of said diseases; nor shall any person or persons, company or corporation, drive on foot, or transport in private conveyance, from one part of the state to another part of the state, any animal, knowing the same to be affected with, or to have been exposed to, any of said diseases. Any person or persons violating the provisions of this section, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by fine not exceeding the sum of two hundred dollars, or by imprisonment not exceeding six months, or by both fine and imprisonment.

SECT. 8. That it shall be the duty of the several county attorneys to prosecute all violations of this act, which shall be brought

to their notice or knowledge by any person making the complaint under oath; and the same shall be heard in any supreme judicial court having jurisdiction in the county in which the violation of this act has been committed.

SECT. 9. That the said commissioners are hereby authorized to appoint or elect one of their number as secretary of said board, who shall receive a reasonable compensation for his services during the time in which, under the provisions of this act, the services of the said commissioners shall be required. The said commissioners shall make and preserve a full record of all rules and regulations promulgated under the provisions of this act, of all payments and expenses hereunder incurred, and all other transactions performed by said commissioners in the discharge of their duties as herein provided; and the said commissioners shall, on or before the first Wednesday in January of each year, during their continuance in service, and at other times as they may deem conducive to the public interests, or as they may be required so to by the governor of state, report to said governor full and accurate accounts of their expenditures, and other proceedings under the provisions of this act, and of the condition of said diseases, if any, in the state, to be communicated by him to the legislature. Whenever the functions of said commission shall be suspended or terminated, it shall turn over to the secretary of state, all its books, papers, records, and other effects, taking his receipt therefor, and he shall remain the custodian of the same until such time as the functions of said commission may be restored.

SECT. 10. That the commissioners shall have power, and are hereby authorized to employ skilled veterinarians, and such other agents and employes as they may deem necessary to carry into effect the provisions of this act, and to fix the compensation of the person or persons so employed, and to terminate such employment at their discretion; and they are authorized out of the moneys by this act appropriated, to make such expenditures as may be needed for the actual and necessary traveling expenses of themselves and their said employes, stationery, expense of disinfecting premises, cars and other places, destroying diseased and exposed animals, and paying for the same, and such other expenses and expenditures as they may find to be actually necessary to properly carry into effect the provisions of this act.

SECT. 11. That the moneys appropriated by this act shall be paid over to the secretary of said commission, from time to time, as the same may be found to be needed, upon requisition made by the said commissioners, and shall be disbursed by the said secretary of said commission only upon vouchers approved by said commissioners or a majority of them. The said secretary shall before entering upon the duties of his office, take an oath to faithfully discharge the duties thereof, and shall enter into a bond to the State of Maine, with sureties to be approved by the treasurer of State, in such sum as he may designate, for the faithful accounting of all moneys received by the said secretary of the commission, under the provisions of this act.

SECT. 12. That for the purpose of carrying into effect the provisions of this act, the sum of five thousand dollars, or so much thereof as may be necessary, is hereby appropriated out of any moneys in the treasury not otherwise appropiated.

SECT. 13. That all acts and parts of acts inconsistent or in conflict with the provisions of this act, be, and the same are hereby repealed.

Approved February 14, 1889.

LAW RELATING TO CONTAGIOUS CATTLE DISEASES AS AMENDED IN 1893.

CHAPTER 194.

An Act to amend an act entitled "An Act to extirpate Contagious Diseases Among Cattle."

Be it enacted by the Senate and House of Representatives in Legislature assembled, as follows:

SECT. 1. Section one of chapter one hundred and seventy-seven of public laws of eighteen hundred and eighty-nine, is hereby amended by striking out the words, "and other live stock" in the fourth line, and inserting instead the words 'horses and sheep,' so that said section as amended, shall read as follows:

'SECT. 1. That for the purpose of facilitating and encouraging the live stock interests of Maine, and for extirpating all insidious, infectious and contagious diseases, now or that may be among cattle, horses and sheep, and especially tuberculosis, the governor of the state is hereby authorized and required, immediately after the passage of this act, to appoint a board of cattle commissioners consisting of three persons of known executive ability, who shall be charged with the execution of the provisions of this act, and who shall be known and designated as the State of Maine Cattle Commission, and whose powers and duties shall be those provided for in this act, and whose tenure of office shall be at the option of the governor. The compensation of said commissioners shall be at the rate of three dollars per day during the time they are actually engaged in the discharge of their duties as commissioners. The said commissioners shall respectively take an oath to faithfully perform the duties of their office, and shall immediately organize as such commission by the election of one of their number as presi-

dent thereof, and proceed forthwith to the discharge of the duties devolved upon them by the provisions of this act.'

SECT. 2. Section two of said act is hereby amended by striking out the word "two" in the twenty-ninth line and inserting instead thereof the word 'one;' and by striking out the words "one hundred" in the thirtieth and thirty-first lines and inserting instead thereof the word 'fifty;' also by striking out the word "one" in the thirty-sixth line, and inserting instead thereof the word 'three;' also by inserting after the word "disease" in the thirty-seventh line the words 'and the owner or owners shall furnish satisfactory evidence as to the time such animal or animals shall have been owned in the state,' so that said section two as amended, shall read as follows:

'SECT. 2. That it shall be the duties of the said commissioners to cause investigation to be made as to the existence of tuberculosis, pleuro-pneumonia, foot and mouth disease, and any other infectious or contagious diseases. And such commissioners or their duly constituted agent, are hereby authorized to enter any premises or places, including stock yards, cars and vessels within any county or part of the State in or at which they have reason to believe there exists any such diseases, and to make search, investigation and inquiry in regard to the existence thereof. Upon the discovery of the existence of any of the said diseases, the said commissioners are hereby authorized to give notice, by publication, of the existence of such disease, and the locality thereof, in such newspapers as they may select, and to notify in writing the officials or agents of any railroad, steamboat or other transportation company, doing business in or through such infected locality, of the existence of such disease; and are hereby authorized and required to establish and maintain such quarantine of animals, places, premises or localities as they may deem necessary to prevent the spread of any such disease, and also to cause the appraisal of the animal or animals affected with the said disease, in accordance with such rules and regulations by them as hereinafter authorized and provided, and also to cause the same to be destroyed, and to pay the owner or owners thereof one-half of their value, as determined upon the basis of health before infection, out of any moneys appropriated by the legislature for that purpose; provided, however, that no appraised value shall be more than one hundred dollars for an animal with pedigree recorded or recordable in the recognized herd-

books of the breed in which the animal destroyed may belong, nor more than fifty dollars for an animal which has no recordable pedigree; provided, further, that in no case shall compensation be allowed for an animal destroyed under the provisions of this act, which may have contracted or been exposed to such disease in a foreign country, or on the high seas, or that may have been brought into this State within three years previous to such animals showing evidence of such disease, and the owner or owners shall furnish satisfactory evidence as to the time such animal or animals shall have been owned in the State; nor shall compensation be allowed to any owner who in person, or by agent, knowingly and wilfully conceals the existence of such disease, or the fact of exposure thereto in animals of which the person making such concealment, by himself or agent, is in whole or part owner.'

Approved March 10, 1893.

BOVINE TUBERCULOSIS IN ITS RELATIONS TO THE HUMAN FAMILY.

Paper read before the Academy of Medicine and Science, Portland, Me. February 8, 1897, by Dr. George H. Bailey, State Veterinary Surgeon of Maine.

Ordinarily I would feel that an apology was due the members of this academy in my taking up the required time of presenting this paper, were it not that I feel assured in advance, that no unfriendly or hostile criticism will follow its reading and discussion this evening, and that I can safely rely upon the same generous and fraternal support that has heretofore been so freely accorded me by the entire medical profession of Maine. Regarding as I do the invitation to address myself to so many men of special attainments in medicine and surgery, as an honor I ought not to decline, not in a personal sense, but rather as a recognition and assurance to all veterinarians, that the barriers that have so long separated the allied professions are fast being removed, as our men are found more worthy to compete in the arena of medicine, with those who are seeking to solve those important problems of sanitary reform, and the preservation of the public health. All sciences gain by assisting each other, and we are surely and safely moving along parallel lines, as long as we co-operate together for the benefit of mankind; and it may be that ex-Governor Coburn "builded better than he knew," when during the war, he was asked to appoint a surgeon for the 29th Maine Volunteers. "Yes," said the Governor, "The 29th is a veteran regiment, and it shall have a veterinary surgeon."

The subject assigned me by your committee has entered largely into the clinical and practical experience of a busy practice during

the last decade, and is one about which there is no danger of any of us knowing too much about, as long as it continues to head all the mortuary tables of the "old and new world," and is of such vital importance to every man, woman, and child in the community from the cradle to the grave. A disease that annually numbers among its victims fourteen per cent of the human family appeals with equal force and significance to the medical profession, as it does to the veterinarian within whose province and control the purity and freedom from disease of our dairy products more properly belong.

The establishing of a correct diagnosis of this disease is as indispensable for those engaged in human medicine, as for those who are occupied with veterinary sanitary reform, and while you, gentlemen, are restricted with experimenting upon your own species, the veterinarians have come to your support with new methods and new means of analysis in a form much more definite and precise than it were possible for you to employ.

What then is tuberculosis? It is the general name given to a class of diseases in animals, of which consumption in the human family is a common type, and has been known for many centuries, under many different names. Tuberculosis in all its forms is caused by a specific microbe, the action of which upon the tissues produces histological and vascular changes which are characteristic of chronic inflammation. In general the tubercle bacilli may be disseminated either by the lymph or the blood channels or by both combined. In 1882, Robert Koch of Berlin, announced to the profession his great discovery. He had found and demonstrated the true and essential cause of tuberculosis, the bacillus of tuberculosis. He had not only found the bacillus, but showed that it was present in all tubercular lesions. He had isolated and cultivated the bacillus from tubercular tissue; and finally, he had furnished the crucial test—had produced tuberculosis artificially in animals by inoculation with pure culture. A few years later the scientific world became highly interested in the announcement of the further discovery by Koch of a "lymph or tuberculin" that bid fair to become a cure for consumption in the human family. It failed because of the fact that while it produced a characteristic rise in temperature, it rapidly accelerated the disease it was intended to cure. The action of tuberculin upon the tubercle bacillus being

that of an excitant, it arouses the germs to increased activity, and they rapidly increase in number, inducing that form of the disease recognized as "acute miliary tuberculosis." This reaction is what brought tuberculin into disfavor as a cure. "*The remedy was worse than the disease.*" This result of tuberculin tests in the human patient, induced Professor Gutmann of the veterinary Institute at Dorpat, Russia, to test its applications to animals and in 1891, he instituted a series of experiments in the tuberculin tests followed by a series of post-mortem examinations through which he was able to demonstrate the presence of the disease, and that it could be distinguished from other diseases that are attended with a rise of temperature; and since then his discovery has been accepted by the veterinary profession throughout the civilized world.

The theory has been advanced that repeated injections of tuberculin in cattle until they cease to react, indicated that recovery was possible, but I believe the better reasoning to be that the tendency is to make the disease more chronic, and less acute; and if persisted in the result will show that the "dead germs and the dead patient" will be buried together. Cattle may acquire an immunity from its use, the same as people do from taking repeated doses of arsenic, while its harmless effect upon a well animal can be best illustrated in the case of the Ayrshire cow "Rena Myrtle" in the experimental station herd of Vermont. This cow has been tested every six months since 1892, and in 1895 gave the largest milk and butter record they had ever got at the station from any cow, of any breed; when she produced 546 pounds of butter.

Among micro-organisms, the bacillus tuberculosis, although the most infinitesimal of them all, (about one ten thousandth of an inch in length,) is at once a despot and a millionaire. He will live in ice, maintain vitality at temperature below 150° F., resists moisture, drought and decay, and bids defiance to the germicidal action of the gastric juice; the czar of all mankind, (as well as all the Russians,) and responsible for more deaths among the human race than any other germ, while more people die annually from consumption than from war, pestilence and famine.

Tuberculin is made from pure culture of the tubercle bacillus, highly concentrated, until a maximum amount of its ptomaines are developed, then filtered through porcelain, the filtered fluid being heated to a high temperature to destroy the vitality of any and all

germs. The German or imported tuberculin is put up in five gram bottles, and has cost as high as $1000 a pint. Glycerine and carbolic acid are then added to reduce it to a ten per cent solution, of which from two to four c. cs. are injected under the skin of the neck or shoulders of cattle by means of a sterilized hypodermic syringe. The average normal temperature of a cow is from 101° to 102° F., and the normal temperatures are taken before and at the time of injection, and tuberculous cattle respond by a rise of temperature usually from the tenth to the twentieth hour after injection; a rise of two degrees over the normal temperature after injection being ground for suspicion, unless there is some physical disturbance such as cows being in heat or near calving; but if the animal is healthy, there should be no rise of temperature, and no possible injury to the cow. Very old cows do not respond to the test as readily as primipazas, and I have met with several badly diseased cows in which no reaction occurred, the system being so thoroughly saturated with the natural tuberculin, that the small amount injected had no apparent effect. Such cases can always be easily recognized, however, by physical examination, and have only been tested during experimental work.

The identity of tuberculosis in mankind and domestic animals being fully demonstrated, and being highly infectious, we now know that it is communicable from animals to animals, from animals to mankind, and from mankind to animals in return. Millions of the germs are in the air we breathe and in the milk we drink, so that inhalation, ingestion, inoculation and heredity, all contribute to disseminate the malady. Man is also liable to receive from the lower animals and to communicate to them other diseases, as hydrophobia, variola, glanders, syphilis and cholera.

As it would be trifling with time to discuss the imminent danger of inhaling the dry dust of the sputa from consumptive men and animals, I pass at once to the consideration of the danger from milk, the great food product of the human race. I assume that the first thing that ever passed our lips was milk; either derived from our good mothers, or the "family cow," and while we shall always retain a reverence for both, (perhaps not equally divided) they will always remain associated with our rock-a-bye-baby days, while life will be far too short to ever efface from our memories the nursery story of the "cow that jumped over the moon" which

acrobatic performance still remains the "best on record." The ordinary inspection of milk brought into our city, demands that its average composition shall be water eighty-seven per cent, and solids thirteen per cent, the solids including fat, casein, milk sugar, albumen and ash; the casein and albumen containing nitrogen, of special value in cheese making, and the fat for butter. The water contains most everything, from pollywogs to bacteria, which immediately after milking may vary from zero to over 10,000,000 in a single cubic inch of milk; depending almost entirely upon the temperature at which the milk is kept. The influence of temperature on the growth of bacteria is well known, and all milk should be kept below 50° F. until sterilized or consumed. Judging from tests thus far made abroad, city milk which contains not more than three or four millions bacteria per cubic centimeter may be regarded as exceptionally good for European cities; while considerably over two hundred distinct types of ordinary milk bacteria have been described in literature up to the present time. Milk as it exists in the udder of a healthy cow is germ free, that is, it is practically sterile; but the milk that comes to the consumer contains a large number of living germs. Dr. Freeman of New York, pathologist to the Foundling Hospital, in the medical record, gave a practical demonstration of the extent of this contamination. Three petri plates, three and one-half inches in diameter, containing a layer of sterile nutrient gelatine were exposed for two minutes each on a gentleman's farm near New York. One was exposed out of doors, a second in the barn, and a third under a cow just in front of the pail during milking. Subsequent examination showed that the plate exposed out of doors contained six bacteria, while that exposed in the barn received one hundred and eleven bacteria, and that exposed under the cow received one thousand eight hundred bacteria. If the latter number will fall from the belly of a cow during milking in a circle three and one-half inches in diameter in two minutes, one can easily appreciate the immense number that will fall into an ordinary milk pail during the whole period of milking; and this emphasizes the fact that the great secret of obtaining a proper supply of milk, is to have a healthy cow, and to keep that cow clean.

Dr. Freeman summarizes the diseases that may be conveyed by milk as first, those in which the pathogenic micro-organisms which are introduced into the milk are conveyed from the body of the

diseased cow, as tuberculosis, anthrax, and acute entezitis. Second, those in which the pathogenic micro-organisms are introduced into the milk from some other source either during or after milking, as cholera, typhoid fever, and diphtheria. Third, those caused by milk which contains poisonous agents developed by bacterial growth.

Maine produces approximately 58,000,000 gallons of milk per year, and makes about 17,000,000 pounds of butter; while New York City alone consumes more than seven millions of gallons of milk every year, and the produce of the United States is five billion gallons annually. How much of this milk contains the "germs of death" may well challenge our attention and best efforts to suppress.

Prof. Ernst of Harvard College, and Dr. Peters, State Veterinary Surgeon of Massachusetts, report from the result of their experiments conducted under the most exacting conditions and with every possible precaution against contamination, that the proportion of positive results in a lot of cows affected with a high degree of general tuberculosis was eighty per cent; in a lot affected with only a moderate degree, sixty-six per cent; and a lot in which the disease was localized in the lungs, thirty-three per cent. Dr. Ernst says,

First, and emphatically, that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.

Second, that the virus is present whether there is disease of the udder or not.

Third, that there is no ground for the assertion that there must be a lesion of the udder before the milk can cantain the infection of tuberculosis.

Fourth, that on the contrary the bacilli of tuberculosis are present, but with no discoverable udder lesions.

From 114 samples of milk from cows showing clinically no udder infection, 31.5 per cent proved tuberculous by the microscope; of twelve pigs fed with the same, fifty per cent proved tuberculous; and of twenty-three calves fed with the same, twenty-five per cent proved tuberculous. In response to Dr. Ernst's enquiries addressed to physicians and veterinarians, the following answers were received from those who had observed or suspected the infection of the human family from tuberculous milk. From 1,013 medical men, he received replies: Positive, mother to child, 8; positive, cow's milk to child, 11; suspicious, 16.

The replies from veterinaries were much more conclusive. From fifty-four veterinaries, he received replies: Positive cases, 14; suspicious, 9.

Dr. Ernst remarks, "The latter is startling in its percentage, until one remembers the greater facilities the veterinaries have for observing such cases and their origin." "In thirty-eight specimens of milk inspected, in only one of them was it possible to demonstrate the presence of the tubercle bacillus microscopically, but in thirty-eight injections of the same milk in animals, we had transmission by tuberculosis demonstrated six times.

Bollinger, showed that a pure culture of tubercle bacilli gives positive results in inoculation experiments in a dilution of one to 400,000; thus showing that the milk may be infectious when the bacilli are so scanty as to be undiscoverable without an extremely exhaustive examination.

Dr. Williams, M. D., of Massachusetts says, "I have seen many cases of tubercular disease from milk, mostly in hand-fed babies of perfectly healthy parentage, developing tabes mesenterica, phthisis, and tubercular menengitis."

Dr. Hillock, M. D., of South Carolina, writes of a case where a strong, vigorous child without a trace of disease in its ancestry, lost its mother at birth, and was suckled by a woman well advanced in pulmonary consumption in opposition to his remonstrances. The child was ailing ever after, and died of tuberculosis." I pronounce this a case of tuberculosis being transmitted through the milk of the woman who nursed the child.

Dr. Stang, M. D., reports in his practice, "a well developed five-year-old boy from sound parents whose ancestors on both sides were free from hereditary taint, succumbed, after a few weeks' illness, with acute miliary tuberculosis of the lungs and enormously enlarged mesenteric glands. A short time before the family cow had been killed and found to be the victim of advanced pulmonary tuberculosis."

Dr. Demme, M. D., reports the case of four infants in the Child's Hospital at Berne, the issue of sound parents, without any tuberculous ancestry, that died of intestinal and mesenteric tuberculosis, as the result of feeding upon the unsterilized milk of tuberculous cows."

While inspecting a herd of cattle a few years ago in eastern Maine, I had just given an unguarded diagnosis of tuberculosis in

a fine looking Jersey cow, when a woman's sharp voice rang out behind me "For God's sake doctor don't tell me that, my baby has been fed on that cow's milk," and although the story was told the mother at the time, that the cow proved sound, a broken hearted mother now knows that I told her the truth.

A Scotch family all of sturdy health, had a herd of cows which developed tuberculosis. Two daughters, being young, were brought up on the milk. Their two older brothers, being more fond of whiskey than of milk, are still living, healthy and hearty, while the two sisters are lying in their graves, victims of tuberculosis. I also have in mind the case of two young men whose history was free from phthisis, raised upon a farm in Maine, where a herd of cows proved tuberculous; the younger remaining upon the farm and living largely upon milk; the older coming to Portland and drinking the more popular beverage of this sea-port town. The younger man long since died of phthisis, while the older brother is still with us, although just at present in the "Keeley."

A child four years old, great grandson of Henry Ward Beecher, recently died in New York of tubercular meningitis. There were no hereditary tendencies to the disease known. The certainty that he had the disease, and the inability to account for it from human agencies, led the physicians to suspect the milk of two Alderney cows on which the child had been mainly fed. The tuberculin tests and the post-mortems showed that both animals were tuberculous.

Dr. Stalker, of the Ohio Board of Health, writes, "A few days since, I made a post-mortem of a cow, the milk of which had been used to nourish an infant. The child died, and the autopsy revealed in the clearest possible manner extensive tuberculosis. I know of a large herd of cows in Maine, several of which proved tuberculous, where the owner kept a large watch dog constantly in the barn and fed him with all the milk he wanted. That dog developed a case of mesenteric tuberculosis, and the post-mortem shew almost every abdominal organ affected. Swine, are also very freely infected by the injestion of milk, and our State commission have several times discovered hogs that had been fed the skim milk of tuberculous herds of cattle, badly diseased. A Vermont herd revealed seventy-eight out of ninety-one animals diseased by tuberculin tests and many of the swine fed on the skim milk from the dairy were found as tuberculous as the cows. On another Vermont

farm where the disease was located, over sixty of the cows, over one hundred hogs, all the chickens, the dogs, and the family cat were exterminated and all proved to be diseased upon autopsy.

That the blood can and does infect, as well as the milk, is shown by a recent Massachusetts experiment, where a litter of pigs, (whose mother was proved to be free from the disease,) were kept under a slaughter house where they had no food but corn meal and the blood drippings from slaughtered tuberculous cattle; and were all found badly diseased in a few weeks.

Dr. Dewerve, M. D., of Paris, had among his patients three brothers who successively sickened and died of tuberculosis. They had shared the same bed, and were all bed-bug bitten. Thirty bugs were caught, and put upon three healthy guinea pigs, all of which soon died, and post-mortems showed well marked tuberculosis. From the diluted and filtered pulp of fifty crushed bed-bugs, bacterial cultures were obtained which caused typical tuberculosis when inoculated.

Dr. E. O. Shakespeare, U. S. Cholera Commissioner says: "With all its terrors, cholera is not nearly as deadly as tuberculosis, and it has been found that in infants and young children in some large cities the mortality from some form of tuberculosis is far greater than is generally believed, amounting in some localities to one-fifth of the deaths in the young, and the "Archives de Medicine" says that "of the population of the globe, three millions die annually of consumption." The fact that milk is consumed largely by infants and invalids for many of whom it is the exclusive article of diet, accounts largely for the intestinal troubles of children whose powers of absorption are much more active than adults.

Dr. E. F. Brush, M. D., of New York, calls the cow, "the wet nurse of consumption" and explains the connection between animals and men. "Scrofulous females in the human race usually secrete an abundance of milk, because there is an unusual tendency to glandular enlargement and activity. As the mammary is the perfect type of glandular structure, it is stimulated to increased action. A scrofulous cow is usually the largest milker; and the closest kind of consanguinity has been practiced by breeders, with the object of producing a scrofulous animal, not because she is scrofulous, but because the particular form she represents are the largest yielders of milk." As Dr. Brush is a large breeder of

Jersey cows as well as a prominent physician, I think we can safely rely upon his conclusions.

I quote Dr. Whittier, M. D., who compares the causes of syphilis and tuberculosis. He says, "One man is not more pre-disposed to either disease than another; syphilis affects one person more than another because the virus finds a better lodgment upon the mucous membrane. Tuberculosis finds also fortuitously, a better nidus in one case than another. The virus of tuberculosis is lodged in one case, and not coughed up; just as in syphilis the virus is secreted, and not washed off."

It is less than a quarter of a century ago since glanders and tuberculosis were considered the same disease, and glanders in man has often been mistaken for syphilis. Cattle, fortunately, possess an immunity from glanders, and no cases are recorded.

In the northern part of New York City, there were recently tested 139 cows, twenty-seven of which were found to be tuberculous, and these same animals had recently been supplying with milk the New York "Juvenile Asylum" and the Institution for instruction of the "Deaf and Dumb."

In a dairy in England, three cows were found to have tuberculous disease of the udder. In the institution to which this milk was supplied, the morality from tuberculosis during the past year was thirty per cent and during the preceding year forty per cent of the total morality.

The propolastic problem might be solved by Pasteurization, which can be successfully applied without lessening or injuring the nutritive value of the milk. Heating up to 167° F. for fifteen or twenty minutes and then cooling rapidly as possible, is sufficient to destroy the pathogenic germs which are most feared in milk, including the bacillus tuberculosis, bacillus typhosis, the bacillus diphtheria and many other pathogenic bacteria. A higher temperature coagulates the albumen, lessens the digestibility, and increases the liability to constipation. Separating the cream by centrifugal force, "separators," is also said to free the product from not only large numbers of the bacilli, but all a large amount of other impurities.

The virulent outbreak of tuberculosis upon our own State college farm, together with those of Massachusetts, New Hampshire, and Vermont; also the Insane Asylum herds of Eastern and Northern Illinois, and the Insane Asylum herd at Willard, New York, should impress upon us all the vital importance of investigating

this source of food supply, for the inmates of all our charitable and public institutions. The herds supplying the Maine General, and Central Maine Hospitals, the Augusta Insane Asylum, all Industrial and Juvenile schools in this State, should be tested at least once a year for public safety, and we should all agitate and educate together upon this subject until it is accomplished. In this connection by way of negative evidence it is interesting to compare the geographic distribution of cattle and tuberculosis. Dr. E. F. Brush of Mount Vernon, N. Y., has given years of study and investigation to this matter, and in his papers, scattered through the New York Medical Journal, makes the statement that tuberculosis does not exist among people which do not employ milch cattle. The inference to be drawn is not that human tuberculosis comes mainly from cattle, for man gets his infection mostly from his fellow man, but that possibly the primary source of infection, and more or less of its maintenance and extension are due to cattle. Whatever be the inference, there is little question that human consumption is relatively less prevalent in countries where there are few or no cattle, such as Iceland, Newfoundland, Algiers, Peru, and Islands of the Pacific, Norway, Sweden, Lapland and Greenland, where reindeer, goats or mares furnish the milk. In some of the Western South American countries, cattle are used only for beef, since so many cases have been traced to the use of milk, that the entire population with scarcely a single exception leave it alone. The flesh itself only contains tubercles in very rare cases. The bacilli are non-motile, and consequently cannot penetrate into the tissues without assistance, and muscular tissue is a substance so unfavorable for the bacilli that they cannot multiply in it. In the beginning they are isolated and in the interior of cells, but are constantly found in places where the tuberculous process is commencing or actively progressing. The comparative danger from the use of milk and meat is greatly diminished in the latter, by the fact that all civilized communities are supposed to cook their meat sufficiently to destroy all germs contained in the small lymphatic glands between the muscles, rather than in the muscles themselves. Dr. Law points out "another danger from the disease, through the life product of the bacillus" and says: "It is this extension of tuberculosis under the influence of the toxic products of the bacillus which raises the most important question in connection with the consumption by man of the flesh and dairy products of tuberculous

animals; and yet the question has been overlooked by sanitarians in the most unaccountable way. It has seemed enough for them that the living tubercle bacillus did not exist in the juices of the muscles nor in the meat. It seems never to have occurred to them that all the soluble poisonous products of this bacillus were constantly circulating in the blood which passes through the muscles, and that they traverse the blood-vessels of the mammary glands, and escape into the milk." Accepting then as undeniable the presence of the soluble chemical poisons in blood, flesh, and milk, it follows that those who eat this flesh or milk are constantly taking in small doses of tuberculin; and in that case, if they are already the victims of tuberculosis, in however slight or indolent a form, this continuous accession of the poison will rouse the morbid process into greater activity and secure a dangerous extension.

Dr. Treon, describes the poor, emaciated, diseased animals furnished to the tribes of Northwestern Indians, how they eat the liver, tallow and entrails raw and fresh, and how the carcass is dried, pounded and packed in skins to be eaten later, uncooked, even though the animal died of disease. The Indian mortality from consumption is fifty per cent of all deaths from several points, while at Crow Creek, Dakota, fifty out of the total Indian population of 1200 die yearly of consumption and scrofula.

But there is another side to all this: Consumption in man is communicable to animals and none such should be allowed to care for cattle, or be engaged in dairy work; but as long as phthisical patients ignorantly spread the disease in all directions by allowing the sputum to fall in any locality where it may be converted into dust, such must be the case. It would be far better for the community, in my opinion, to convert the patients themselves into dust, than to allow their sputa to become thus disseminated. The most frequent form of tuberculosis is consumption of the lungs, and in persons affected with this disease, their sputa is loaded with the infective microbe, it having been proven that the expectoration in a single given case, contained more than four thousand millions tuberculous bacilli in a single day, while a single spit contained over sixty millions of them. In considering the ways in which tubercle bacilli cause infection, Dr. Salmon, chief government inspector of Washington, D. C., places them in their order of frequency as follows:

First. By inhalation into the lungs.

Second. By ingestion into the digestive tract in the milk of tuberculous cows.

Third. During coition, when the sexual organs are tuberculous.

Fourth. From the tuberculous mother to the foetus of the infant.

Eight cases of consumption occurring within a few months in an English convent were traced to a single case. There had been no isolation, but all had slept in the same general dormitory. Cornet found during twenty-five years in thirty-eight cloisters, 2,099 nuns acting as nurses had died. Of these 1,300 or sixty-three per cent had died of tuberculosis. Prison consumption is notorious, and Kennan reports it to be the great scourge of Siberian prisons. Dr. J. B. Ransom, physician of the States Prison, Clinton County, New York, states that the percentage of total deaths from tubercular disease in that prison is over eighty per cent. In a lying-in hospital in Berlin was a nurse whose business it was to resuscitate children who were born asphyxiated by breathing into their lungs. Of ten infants so treated every one died of tuberculosis. The nurse died and upon examination showed that her lungs were tuberculous. The children were all shown to have been of healthy parents. The kissing of consumptive girls is also a liability, and should give us more faith in the good sense of the old lady who expressed her preferences by "kissing the cow."

The British Medical Journal reports the following, which shows the tenacity of the life of the bacillus under ordinary conditions: "A family of nine occupied a house inhabited ten years previously by two tuberculous patients. A short time after although the whole family had been in splendid health, three among them showed symptoms of tuberculosis. They used the same bed-room as the former tenants. Dr. Ducor had pieces of wall paper and dust from the ceiling and walls examined. In both cases the tubercle bacillus was found. Dr. Flink, M. D., at a recent meeting held to discuss this subject, showed by a map of the city of Philadelphia, which located every house in the fifth ward in which tuberculosis had occurred in twenty-five years, that the disease chiefly prevailed in a series of infected houses which constituted less than one-third of all the houses in the ward, but furnished more than half the deaths. It was also observed that a large percentage of all the cases of mesenteric tuberculosis in children occurred in these houses.

Direct inoculation is also another source of danger. Dr. Ernst cites a case of localized tuberculosis of the tongue: "A gentle-

man perfectly well on Thanksgiving Day, by eating something affected with tuberculosis, became infected with tuberculosis of the tongue. He had a nodule half as large again as an English walnut, which was pure tuberculosis, as was shown under the microscope in a piece taken off with the use of cocaine." A woman whose ancestors were without tuberculous taint, ate eleven chickens bought from a neighbor. These chickens had been in the habit of eating the spittle of their consumptive owner. The woman soon developed a well marked case of tuberculosis of the bowels. The case in Springvale, in this State has been already reported by me, where a woman in consumption had raised a flock of chickens that had access to the sputa cups of their owner, and after the woman died, every one of them were found affected with tuberculosis.

Pieffer attended a veterinarian of good constitution, without hereditary pre-disposition, who cut his right thumb deeply during a post-mortem on a tuberculous cow. The wound healed but remained swollen. A year later pulmonary tuberculosis had developed and in two and one-half years after the wound the man died. Post-mortem examination showed tuberculosis of the joint of the wounded thumb and of the lungs.

The contagion and infection of the disease being universally conceded, I approach the more debatable and complex problem of heredity, as one having afforded me so many clinical and convincing evidences of its presence and importance as to commit me firmly to its support. It is but a few short years ago that the medical profession were firmly united in their belief in the heredity of tuberculosis, and although some modern writers are wavering in their faith, the laws of nature are just as immutable as ever, and one of the most paramount of these seems to be that the fundamental law of heredity is that "like begets like" or the likeness of some ancestor. Webster defines heredity as transmitted from a parent to a child, as heredity bravery, heredity disease, etc. As long ago as in the reign of Augustus Cæsar, the first Latin Lyric poet wrote not as a fanciful hypothesis, but as an established principle:

"The brave begotten are by the brave and good.
There is in steers, there is in horses blood,
The virtues of their sires. No timid dove
Springs from the coupled eagle's furious love."

Oliver Wendell Holmes gave utterance to his faith and belief of heredity when he said, "Of the human family, I go always, other

things being equal, for the man who inherits family traditions and the cumulative humanities of at least four or five generations."

And Rev. DeWitt Talmage says, "that the physical and mental and moral qualities are inheritable, is patent to every one who keeps his eyes open. The longer I live the more I believe in blood, good blood, bad blood, proud blood, honest blood, thieving blood and and cowardly blood. As Indian blood means roving disposition, Roman blood means conquest, and the Jewish faculty for accumulation, you may trace back to Abraham, of whom the Bible says, "He was rich in silver and gold and cattle."

No hereditary disease is hereditary in every instance, even inherited syphilis is very feebly contagious, while acquired syphilis is actively so. We hear a great deal about the scrofulous diathesis, the predisposition and susceptibility of tuberculosis, and if these terms are to be interpreted as applying to men or animals who have had transmitted to them weak, frail and debilitated bodies, as opposed to those who have descended from parents whose stamina and vigor were sufficient to overcome and resist tuberculosis, and all other germ diseases that practically amounts to immunity; or that men and animals that have descended from *tuberculous parents* inherit a special or constitutional predisposition to the disease. I accept their logic, just as in "seed time and harvest," all seeds will grow more readily in favorable soil and climate than on stubborn, rocky ground, so the systems of animals differ in their attractability or receptivity to propagate disease.

The *pre-disposition* to scrofulosis has also been attributed to a weakness or imperfection of the lymphatic system, and great stress has been placed on the importance of an imperfect circulatory and repiratory apparatus as a *pre-disposing* cause of tuberculosis; but I am not aware that a person thus consumptively inclined is therefore of necessity possessed of less power of resistance against other infectious diseases; and that able physician, Dr. Mitchell, of Bowdoin College, has said, "he thought it at least *unfortunate* that people were born with *susceptibility*; and this fact seemed to him apparent from the study of diseases *other than tuberculosis.*

To avoid *pre-disposition* then, in order to be "born right," a man must anti-date to the vigorous ancestry of his great, great grandparents; and if this principle of heredity were kept in mind in breeding dairy cattle there would not be so much tuberculosis.

Blakewell, one of the most noted breeders of live-stock in Great Britain, regarded the animals on his farm as wax in hands, out of which in good time he could mould any form that he desired to create. He believed that the familiar maxim, "like begets like" was not limited to a general similarity of off-spring to parent, but extended to the minutest details of the animal organism.

Tuberculosis is far less easily communicable to other individuals than such parasitic diseases as anthrax or diphtheria, typhoid or yellow fever and Asiatic cholera; and no germ will cause infection unless it finds nutritive conditions of such a nature as to render it pathogenic, (disease producing;) and as a rule, between diseased and absolutely healthy individuals, does not exist. In other words, tuberculosis is only easily infectious in individual men or cattle possessing certain acquired weakness, unnatural to them in health. It has been advanced that Koch's discovery of the bacillus, weakens the theory of heredity, but if it was heredity before, it is heredity now, and to my mind only proves that the disease is inseparable from the germ, and that where no germ exists, we can have no tuberculosis, and no tuberculosis without the germ.

While tuberculosis is not confined to any breed, nor is any breed positively exempt from it. my experience as cattle commissioner has led me to the belief that as far as Maine is concerned, it is largely an imported disease. The fact that so many high-bred and in-bred cattle have come into this State, and that so large a proportion and percentage of them prove to be diseased, has led me irresistibly to the conclusion that to them we largely owe the present condition of our milch herds, as recently disclosed through the aid of tuberculin tests, while the impressive fact remains that we have scarcely ever been called upon to condemn a native bred animal of the old-fashioned rugged "red or brindle" type so familiar to us all; and when an owner writes me that he suspects his cow, and adds that she is a "foreigner," I am apt to think he has made out a "prima facie" case. It cannot be denied that the number of victims to tuberculosis increases with the improvement in, or specialization of our breeds of domestic animals, more and more in-bred for the production of beef or milk; that extreme specialization, that exaggerated activity of the vegetative life in the absence of proportionate muscular exertion, that once *acquired* is susceptible of being transmitted by way of heredity. Animals of a lymphatic or nervo-lymphatic

temperament, attenuated figure, narrow chests, blonds, if you please, do they not remind one of pot-house plants, as compared with the vigor and hardiness of native "out of door" flowers and fruits of the same varieties, and may we not well take a lesson from the Seminole Indians who dwell in the Everglades of Florida and who punish with death any member of their tribe that marry any relative however distant?

The New York State Commission on tuberculosis in cattle say, "The investigations of this commission have shown that tuberculosis is under certain conditions congentail: that its general diffusion is due to contagion, but that a small proportion is disseminated by hereditary transmission."

And the Brussels Congress of 1888 in summing up, say, "tuberculosis has been observed in all warm-blooded animals submitted to domesticity or deprived of their liberty. The disease is contagious in man and animals and is transmitted by heredity."

The Maine State Board of Health, in a concise and instructive circular, 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.

While agreeing entirely with the latter statement, it seems particularly unfortunate for those who deny heredity altogether, that so many of the human family die annually of phthisis whose history show their parents, one or both, died from the same disease. Ten years ago we had one of the most virulent outbreaks of tuberculosis ever known upon our "State College" farm at Orono. Its members consisting largely of Jerseys, had been selected with great care and expense, from many sources and the herd was increased by retaining the heifers and disposing of the male calves. Fifty-one animals (the entire herd) were condemned and destroyed, the autopsies proving in every instance the animals to be thoroughly diseased; even in calves a few weeks or a few months old, an unerring diagnosis could be rendered and confirmed. I found at Orono four generations of milch cows, a heifer, her dam, granddam, and great granddam, standing side by side, all diseased, and were it not for an occasional tell-tale cough, and a typical temperature of about 103°, apparently in perfect health, enough so that several

cows in that herd had produced fourteen to fifteen pounds of butter within the week before the slaughter. Dr. Rich, of Vermont, says, "The form of tuberculosis most commonly met with in cattle is decidedly chronic, and might very properly be called *chronic disseminated tuberculosis.*" This fact causes incredulity on the part of owners and others regarding the existence of so dangerous disease in fine looking herds, and is doubtless due to the chronicity of the disease, as well as to the fact that the appetite and digestion continue good, even when the disease is far advanced.

If the morbific principle does not attack an organ essential to animal existence, the animals may render all the services of one which is in a good state of health: it may produce calves, furnish milk, perform labor, and even become fat. If the center of infection is very limited, encysted, isolated, or calcified, the animal will enjoy relatively good health, and perform its functions as if perfectly well.

The human subject of tuberculosis on the contrary, develops a capricious appetite and faulty digestion in a comparatively early stage of the disease, hence the more rapid emaciation and prominent objective symptoms in man. You may recollect that after the Orono herd had been disposed of, the question came up as to what disposition should be made of the bulls, that had been sold from the herd and were then standing on farms scattered from the Penobscot to the Aroostook. In a letter received from the farm superintendent, he wrote me, "within the past four years fourteen bull calves have been sold from the farm, and eleven of them *came from the cows that we killed*, most of them being but a few days old when sold." Those who professed to disbelieve in the heredity of the disease claimed that these young bulls, being then two and three years old, having gone out from the herd so long before the slaughter, could not possibly be affected; while their environment among sound animals would be proof against contagion by inhalation, inoculation, or ingestion.

Dr. Michenor, chief inspector of the Bureau of Animal Industry, at Washington, who was sent on to assist in disposing of the herd, wrote me upon his return in regard to the first bull inspected.

Dr. BAILEY, D. V. S.,

Dear Sir:—Your letter of 14th is received. I do not see how anyone can advise the keeping of said bull for service. It must be

remembered that tuberculosis is held to be hereditary by all 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.* With kindest regards to all,

I am,

Sincerely yours,

CH. B. MICHENER.

He also wrote me on November 19th.

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 lung left at the American Veterinary College, from a calf of one of the cows of the 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, and will serve to extend it in many herds when their services are required. The Commissioners and the *State Veterinarian*, more than all will be 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. With regards to all,

I am,

Sincerely yours,

CH. B. MICHENER.

Upon investigation, *twelve* out of *fourteen* of those bulls proved by post-mortem examinations publicly made, to be *thoroughly diseased.* The year following the slaughter, some cases of tuberculosis were reported upon a farm at West Lebanon, Me., and some very interesting cases were disclosed which have an important bearing upon the previous cases at Orono, and would seem to set forever at rest the wisdom of the investigating committee who reported:

"In relation to the cattle sold from the college farm, for several years past, we must certainly recommend a most careful examination of those animals, and *especially the bulls recently sold therefrom*, by a competent board of cattle commissioners, to the end that every vestige of said disease, wherever found, may be stamped out and destroyed." The herd at Lebanon consisted of seven cows, four of which were the produce of the Jersey bull, "Butter Roy," purchased by the "State College Farm." The first symptoms of these heifers had been nearly identical, and previous to calving no alarm had been felt about them, but soon after that event they commenced coughing, until they all showed unmistakable evidence of the disease. The bull had already "gone wrong" and had been previously killed.

Upon a critical examination of these heifers, I found them all diseased, the autopsies verifying my diagnosis in every instance; while the significant fact remains, that these heifers *were all out of sound cows*, there having never been, previously or since any other diseased bovines upon that farm.

I take the broad ground that every one of these bulls were "bred and born" tuberculous, and carried with them when they left Orono the seed for an abundant harvest, my position being rendered all the more impregnable by the cold fact, that no case of tuberculosis had ever previously existed upon any one of the farms where the bulls were owned, and that they begot diseased calves, out of sound cows.

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."

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 an 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."

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, calcerous and gray tubercular tumors. In this calf the whole of the serous membranes were affected, which must have been formed "*in utero.*" 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 fœtuses 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 modules 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.

Fleming says that "animals *descended from tuberculous parents inherit a special pre-disposition 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. In human medicine 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 pre-disposition to, as well as the hereditary transmission of the malady should not have been accepted without discussion."

Dr. Blaine, assistant physician to the Willard Asylum for the Insane, at Willard, New York, has recently contributed to the "Medical Record" a paper on bovine tuberculosis; its communication by ingestion, inhalation and hereditary transmission; also its dangers to the public health, in which he gives a full account of the sudden out-break of tuberculosis, whereby the asylum sustained a loss of nearly two hundred head of valuable Holsteins.

Dr. Blaine says of the Holstein bull, "he had not manifested any cough, but was rapidly losing flesh and it was decided to kill him. The bronchial glands were greatly enlarged and on cross section were found calcified. There were many tubercles upon the peritoneum and bowels. Upon the glans penis were several small tubercles having the appearance of a soft chancre." It is not an unusual occurrence for animals well advanced in tuberculosis to abort. Many of the asylum calves were prematurely born two of which required assistance at birth, as the mothers were much exhausted. One of the two was removed in about the eighth month of gestation. This fœtus 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.

No. 2 was from a diseased mother, also in about the eight 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.

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. 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.

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 fœtus through the medium of the parents.

If we demonstrate then, in any instance that hereditary is operative in the case of any fœtus in-utero being found diseased, such clinical fact proves that infection must have been conveyed either by the ovum or the embryo (congenital or congenial transmission.)

Dr. Theobald Smith says, "the tubercle bacillus may pass in the semen of the male and infect the ovum directly."

Second, the ovum may be infected by disease of surrounding structures (peritoneum, ovaries, fallopian tubes) in the female.

Third, the fœtus may be infected by the passage of tubercle bacilli from the maternal placenta into the fœtal circulation. The infection through the placenta is probably the most frequent cause of congenital tuberculosis. It may take place when, in consequence of generalized tuberculosis of the mother, tubercle bacilli are in the circulation and become lodged in the placenta, whence through some ruptured vessel, they may pass into the blood of the fœtus.

The bacteriological examination of the sperma is easier than that of the blood and often of greater importance; and in patients showing no evidence of inherited tuberculosis, there has been found micro-organisms (coci and bacilli) in the sperma of patients, whose blood frequently examined showed no microbic elements. Distinguished German pathologists assert:

The importance of differentiating between the finding of organisms in blood on one hand and spermatic fluid on the other must not be forgotten. The blood is not culture medium, merely carrying micro-organisms with it which it meets in its circulation. The spermatic fluid, on the contrary, is an ideal and favorite habitat for micro-organisms of other chronic diseases besides tuberculosis.

The microbes circulate merely in the blood, but live in spermatic fluid. The presence of microbes in the blood means that somewhere in the body a focus of infection exists which sends microbes into the blood. The presence of microbes in the blood, however, may suffice to furnish an early diagnosis of tuberculosis before any noticeable clinical manifestations ensue. We can point out many cases diagnosticated early as tuberculosis through blood examina-

tion whose only symptoms were anaemia or disturbances of digestion, that proved to be tubercular afterward. The presence of microbes in the spermatic fluid, however, is of far greater importance, as it throws a new light upon the transfer of the microbe from father to child, not only in tuberculosis, but in syphilis, etc. Therefore to the author there is no doubt on this point, that an infected parent can inoculate the ovum at the time of fecundation.

Is not this that mode of generation in which the germ is held to pre-exist in the parent, and its parts to be developed? Is not the ovum a primordial and a typical cell, first in order, existing from the beginning; and when this cell has multiplied and developed and had breathed into it the "breath of life" and passed on to its inevitable result, will any gentleman say to me that it was the *predisposition* and not the *disease*, that was transmitted? If so, he must be gifted with more nervous, then mental perception.

In breeding animals, it is not uncommon to find peculiar features of generations of ancestors long since extinct cropping up occasionally in individuals. How these ancestral peculiarities can be transmitted through many generations, each individual of which originated from a single microscopic cell which has been fertilized by another cell, is one of the greatest mysteries of nature.

Man is developed from an ovule, which differs in no respect from the ovules of other animals, and the embryo itself at a very early period can hardly be distinguished from that of other members of the vertebrate kingdom. Living things alone give rise to living things; protoplasm alone can beget protoplasm; and all living things are composed of cells. Inasmuch as all vital phenomena are associated with protoplasm, it has been termed by Huxely, the "physical basis of life."

I am often told that the *predisposition* is the only part of the disease that is hereditary in the human family, that the mother cannot transmit the disease itself to the child "in utero," but Jacobi of the New York In-lying Hospital has reported a case of a child born at the end of the seventh month of pregnancy. of a mother who died of phthisis in the third week post-parteur; the child lived a few minutes only and section showed miliary tubercles in some of the abdominal viscera and in the pulmonary plura.

Dr. L. Emmett Holt, professor of diseases of children, in the New York Polyclinic, reports five cases of intra-uterine infection. Three of these were under two months old, one being but twenty days. The child who died on the twentieth day was born prematurely of a mother who was suffering from advanced tuberculosis. The child had cheesy bronchial glands and miliary tubercles and small tuberculous nodules in the lungs. In one of the children, dying at the age of seven weeks, cheesy nodules were found in the lungs and spleen. In the other, dying at the same age, the mother had advanced tuberculosis, and died eleven days after the birth of the child. The autopsy showed an extensive tuberculosis pneumonia, with cheesy bronchial glands and tuberculous deposits in the spleen, liver, intestines and mesenteric glands. Intra-uterine infection through the placental circulation has been demonstrated in the human race, by the cases of Birch-Hirschfeld, Lehmann, Bar and Renon, and others.

In Birch-Hirschfeld's case, the organs of a fœtus taken from a woman dying from general tuberculosis, were found to contain tubercle bacilli, bacilli were also found in great numbers in the placental tufts.

In Lehmann's case, there were tubercular lesions in the placenta as well as in the child's organs. Bar and Renon made inoculations in guinea-pigs with the blood drawn in five different cases from the placental extremity of the umbilical vein, where women with advanced tuberculosis were delivered either of living or still-born children. The results of these injections were positive in two cases. Dr. Holt says, "In most of the cases where children die of tuberculosis during the first two or three months of life, I believe the probabilities to be strongly in favor of intra-uterine infection."

Waldeyer and Martin have shown proof positive that the bacillus is present in the greater circulation as seen in the localization of nodules in the liver, kidneys and testicles, therefore there can be no reason why they should not pass out of the maternal placenta.

Dr. Law, in 1877, recognized the existence of tuberculosis in a large Jersey herd in New York. After all the animals had been

killed, Dr. Burton informed him that he had destroyed every representative of a certain family in that herd. The same thing occurred in the recent slaughter of thirty-six out of fifty-eight Jerseys and Ayrshires at Westbrook, all the produce of the cows that proved to be diseased, reacted, while the calves out of the cows that proved sound, failed to react in every instance.

The law of heredity works just as actively now, as it did in the days of Jacob and that like will produce like under like conditions, is just as true of the producers of milk and butter now, as it was of producers of ring-streaked and speckled color in the time of the patriarchs.

Among the human family, as well as among the ox-tribe, has Pharaoh's dream been constantly repeated, from the days of Joseph to the present day. The seven well-favored, fat-fleshed kine have been devoured over and over again by the seven ill-favored and lean-fleshed kine, which Dr. Peters says he has not the least doubt were suffering from tuberculosis. "It is not even necessary to have the seven ill-favored kine to devour the seven healthy ones; for if a single tuberculous cow be placed in a dark, badly-ventilated stable with the seven well-favored ones, kept under unhealthy surroundings and forced to an enormous yield of milk, this single lean-fleshed individual will in time succeed in dooming all the herd."

Dairying is the principal industry in Denmark and the practice of Denmark is to test their herds with tuberculin and then, after the discovery of tuberculosis, instead of destroying them, those found tuberculous are preserved and isolated from the healthy cattle. The milk from the reacting animals is used. They found that by heating the milk from these reacting animals up to 165° or 170° makes just as good butter as milk that is not so heated and brings just as high a price in the market. The restrictions regrading the progeny are very stringent. The calves from these reacting cows are removed at once from the premises in which they are born; they are given milk of healthy cows, or sterilized milk and in that way, it is claimed they cannot contract the disease *unless*

they are born with it. The cows are retained in these dairies, and continue to give milk and produce calves until they develop tuberculosis in a more advanced form and are destroyed.

I do not anticipate any system will ever prevail in Maine where the milk that is not fit for calves will ever be prescribed for human beings. It is proper to state in this connection that Dr. Bang, the originator of the Daush system, does not believe in the heredity of tuberculosis.

It is very fortunate that horses seem to possess an immunity from tuberculosis, although the bond of union between them and mankind is very close and it has become to be a popular fad that a "white horse" is never present without a "red-headed girl" is sure to be in sight. While this may be only a coincidence and not contagious, I think we will all agree that it is certainly red-heditary.

In bovine tuberculosis, no therapeutics which considers the application of remedies as a means of cure, and no surgical interference which is intended to prolong the life of an animal affected, is neither indicated nor practiced, but when you, gentlemen, have a case of phthisis, you keep your patient above ground just as long as possible; while with a tuberculous cow or bull, we get them under ground just as soon as possible; and the bullet is the "official order." Dr. Wedgewood's objection to such summary disposal of his clients (as I understand him) is that my treatment is "too heroic." I know it has been very recently decided "that you cannot crucify mankind" but he has other remedies at hand just as effective to put consumptive men under proper restraint and keep them from transmittiug and furthur *predisposition* to their descendants. I believe that tuberculosis of the genital organs in man is not uncommon and that castration is a legitimate operation, and the only radical treatment to be recommended. The impotence following the operation should be no contra-indication for in all reported cases, the extension of tuberculosis to the "seminal vesicles," impotence always occurs in a short time as a sequel to this form of the disease.

Shakespeare has said, "Diseases desperate grown by desperate appliance are relieved, or not at all." We cannot take our consumptive cows to "Poland Springs" summers, or to Florida or

some Alpine region winters, for "their health" and if we did, we should not send the bulls along with them to propagate that kind of stock. The real decrease of tuberculosis, and other ills that constitute the sad inheritance of humanity will come when persons of phthisical type are sufficiently educated to realize that they ought not to marry. Your profession have a moral responsibility to perform that does not attach to mine, and I hope to live to see the day when you will possess a legal responsibility to forbid all such unholy alliances; and when the heart and hand of any fair and healthy woman is sought by some "consumptive dude," she may reply instead of "ask my papa," "ask my physician," when no reputable or conscientious practitioner would ever consign her to such a living Siberia as that. It is said that marriages are made in heaven, but if his Satanic majesty does not prove to be the grand promoter and boomer of all such alliances, I shall lose all my faith in the book which says, "the iniquities of the father shall be visited upon their children to the third and fourth generation.

Sir Thomas Watson, M. D., wrote a quarter of a century ago: "It would be well for the laity if the multiplication and diffusion of the strumous deathesis could be checked by a prudent avoidance of ill-assorted marriages. It is very desirable that correct notions on these subjects should be generally prevalent; and that persons who are conscious that scrofula in any of its shapes exists in their family and "a fortiori," they who know that it exists in their own corporal frame, should avoid marriage, and the prudence might be enforced if they could be made to foresee the suffering and misery its neglect is calculated to inflict upon their offspring. But on these points our advice is seldom asked."

Statistics show that phthisis, and other tuberculous diseases in which are grouped scrofula, tabes mesenterica, tuberculous meningitis, and consumption of the bowels have decreased since 1860, and we are beginning to realize the fact that this decrease in the mortality from phthisis points to the ameliorating influence of healthier and better ventilated homes; more wholesome feeding, and a higher standard of domestic hygiene; general comfort and prosperity enjoyed especially by the industrial classes.

It was a well recognized principle with the Greeks that men ought to select their wives with a view to the health and vigor of their children. In Sparta, also, a form of selection was followed for it was enacted that all children should be examined shortly after birth; the well-formed and vigorous being preserved, the others left to perish. The well-known case of the Prussian grenadiers is another example of methodical selection, for it is asserted that many tall men were reared in the villages inhabited by the grenadiers and their tall wives.

Edmund A. Parkes, the founder of modern hygiene, a man whose magnificent work has startled us by its simplicity and yet completeness, and who has contributed more to the saving of life than words can express, defines Hygiene as the art of preserving health: "It aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote:" and tells us that if we had a perfect knowledge of the laws of life, and could practically apply this knowledge in a perfect system of hygienic rules, disease would be impossible." In dealing with this subject, we have to consider with regard to animals, the air they breathe, the water they drink, the food they are fed on, the exercise and labor they undergo, and the prevention and eradication of epizootic diseases. Our greatest hygienic triumphs have been won where our advice has been assisted by law. Up to a certain point a man is at liberty to do what he likes with his own property; the law except in the case of certain diseases cannot interfere, and we possess no power of enforcing hygiene; but the public have a right to demand that when they purchase what purports to be wholesome milk, it shall not have mixed with it the germs of a deadly disease. The barns which many of our herds inhabit, damp and dark with no proper drainage or ventilation, are a disgrace to civilized life, and if we could have camp-meetings in Maine to preach the "gospel of cleanliness," instead of faith-cures and hypnotism, the public health would be much better protected. The story of Moses leading the children of Israel out of Egypt, and solving the wonderful problem of restoring the national health of a diseased and degraded people, by compelling them to live for forty years in conformity to the highest sanitary laws, has never yet reached some of the back-towns of

Maine. Governor Cleaves did not need the lantern of Diogenes to find me two honest and earnest men as associate commissioners, but that our work has in many instances been ignorantly opposed and interfered with, is not to be wondered. The property rights of the owner, the health of the consumer, the liability of the State for idemnity have all to be considered, but I regard it to be the first duty of all breeders and milkmen to eradicate tuberculosis from their herds, to save *themselves* and their own *reputations*, as well as their customers and the public at large.

It has often been asserted and as often proved; that we have far less tuberculosis in Maine than any other New England State, as reflected from our annual reports, but that we have far more than can be controlled by any appropriation yet made to carry on the work is very apparent. No other New England State has less than double the appropriation of Maine, while Massachusetts has $300,000 and paid out during 1896 over $173,000 for 5,198 head of cattle condemned for tuberculosis. The present appropriation of Maine, would not last in Massachusetts the present week, and we have thoroughbred herds of cattle in this State, that would require the whole of the present amount to pay for, if they should all prove diseased. So insidious, widespread and fatal disease as this, should certainly command the earnest and thoughtful attention of the present legislature, to enable us to grapple with and eradicate it from all infected herds. The discoveries of such eminent investigators as Pasteur and Koch has evolved from obscurity the essential cause of the disease, and has placed in our hands the means to diagnose the malady in all its stages of development, and its complete disposal has only to be intrusted to capable and conservative men to insure success.

To Charles Darwin, the credit is due of having firmly established by an immense amount of evidence, the scientific explanation of the most important factor in evolution; that every day, fresh discoveries and experiments confirm the great principle of the adaptation of the individual to its external surroundings.

The commodious building in which we meet tonight has been evolved from its inorganic corner-stone, until even the blind have been made to see its fair proportions and enjoy its blessings. More than a century ago Ben Franklin "held the key" that has since

unlocked the mysterious powers of electricity, that furnishes the matchless light by which I read, while the marvellous discovery of the "Roentgen rays" may possibly revert to some modest maiden, who first drew the shadow of her lover upon the garden wall.

In closing, I wish again to thank your committee for the assignment of this evening to address myself to a body of men who have been relieving the sufferings, and prolonging the lives of their fellowmen ever since the time when the "shepherds tended their flocks by night," and that wondrous proclamation went forth "peace on earth, good will to all mankind."