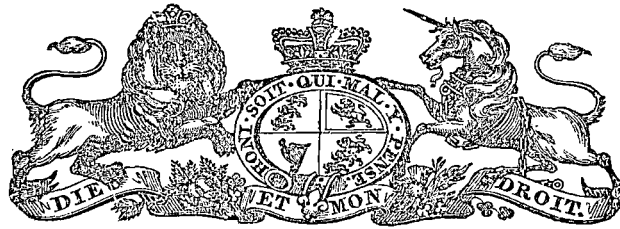


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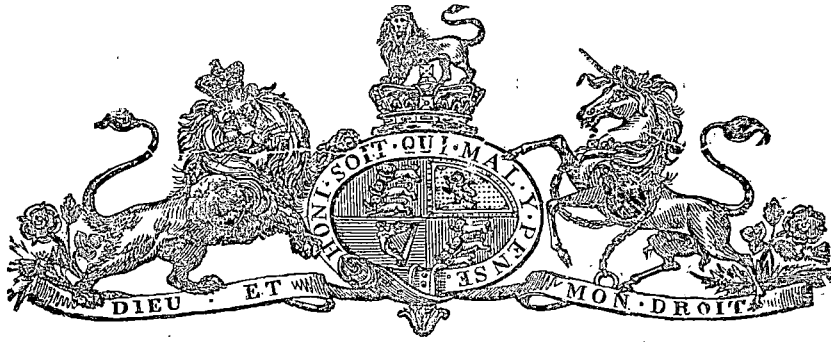
1866.

T A S M A N I A.

PLEURO-PNEUMONIA.

REPORT OF THE ROYAL COMMISSION APPOINTED IN VICTORIA TO
ENQUIRE INTO THE ORIGIN AND NATURE OF THE CATTLE DISEASE
KNOWN AS PLEURO-PNEUMONIA.

Laid upon the Table by the Colonial Treasurer, and ordered by the House to be
printed, 31 July, 1866.



Chief Secretary's Office, Melbourne, Victoria,
25th January, 1865.

SIR,

ADVERTING to my letter of the 16th of November, I have the honor to transmit to you, for the information of the Government of Tasmania, the accompanying copy of the Report of the Royal Commission appointed to enquire into the origin and nature of the disease known as Pleuro-pneumonia.

I have the honor to be,
Sir,

Your most obedient Servant,

J. MOORE,
For Chief Secretary.

The Hon. the Colonial Secretary, Tasmania.

REPORT of the ROYAL COMMISSION appointed by His Excellency the Governor to enquire into the Origin and Nature of the Cattle Disease known as Pleuro-pneumonia.

To His Excellency SIR CHARLES DARLING, Knight Commander of the Most Honorable Order of the Bath, Captain-General and Governor-in-Chief of the Colony of Victoria, and Vice-Admiral of the same.

MAY IT PLEASE YOUR EXCELLENCY :

WE, the Commissioners appointed to enquire into "the origin and nature of the disease known as Pleuro-pneumonia, affecting the cattle of this Colony; how far inoculation, as now practised, is of value as a remedy or as a preventive measure—Also, as to the contagiousness of such disease, and whether the same may be modified by climate, or any and what treatment at present known—Also whether the flesh of animals affected with said disease is to any and to what extent unfit for food;" have agreed to the following Report:—

Since our last Progress Report we have held thirty-four sittings in Melbourne, besides numerous visits to the experimental ground where the healthy and diseased animals were kept on which special investigations were made. Having, in our Progress Report, dwelt on most of the subjects of enquiry set forth in our Commission, we have since directed our attention to the experimental investigations necessary to establish the facts connected with the contagiousness of this disease on which alone legislative action could be taken by the Government for the general benefit. The treatment of the disease we believe may be left to those who devote themselves to veterinary surgery as a profession, and the owners of stock, with greater propriety than to a public commission.

In our Progress Report of last year we stated that we had sent circulars of enquiry to upwards of four hundred owners of cattle in this Colony, and that we had also examined a large number of witnesses who had had opportunities of observing the disease.

From the information obtained through these sources, we were able to arrive at conclusions on some parts of the subject; but we stated that experiments would be necessary in order to enable us to ascertain whether inoculation was of any value as a remedy or preventive measure, as well as to determine the truth or fallacy of the prevalent opinions in the Colony and in Europe as to the mode of contagion.

We gave an account of Pleuro-pneumonia as it appears in oxen, describing the general symptoms, the pulmonary symptoms, the physical signs, and the morbid anatomy of this disease.

We identified Pleuro-pneumonia as the disease which has raged on the Continent of Europe and in Great Britain and Ireland, and which is known as lung disease, pulmonary murrain, exudatory pleuro-pneumonia, and in Germany as Lungen-seuche.

We referred to the extensive prevalence of this disease on the Continent of Europe previous to the year 1745; also to the circumstance that its introduction into England was attributed either to two animals imported from Holland, or to some distempered hides purchased by an English tanner, but that the evidence as to its importation was said to have been most inconclusive.

We related that 200,000 head of cattle were reported to have died of Pleuro-pneumonia in England in 1745; that local boards of health were appointed, with power to cut off all communication between infected and healthy districts, and to superintend the slaughter and immediate burial of infected cattle; and it was considered very doubtful whether any of the measures resorted to had much influence over the extension or duration of the disease, which, after a time, became milder in character, and at length about 1758 began very evidently to decline, although it did not altogether disappear until several years later.

The occurrence of the disease in England in 1841, when it was not usually attributed to contagion; its prevalence in Ireland in that and the three succeeding years; and the large mortality in various districts of the latter country, estimated at from 10 to 40 per cent. of the whole cattle of certain districts, were recounted in our Progress Report.

We mentioned the occurrence of Pleuro-pneumonia at the Cape of Good Hope as an epidemic, and that it there attacked horses and mules as well as horned cattle.

We stated also the popular impression that the introduction of the disease into Victoria appeared traceable to an English cow imported about October, 1858, which subsequently died of Pleuro-pneumonia, and whose lungs showed symptoms of old disease, that the affection spread among the cattle belonging to the owner of this cow, and amongst those of his neighbours in the district of the Plenty, that it reached Broadmeadows, and then followed the course of the Sydney Road, disseminated, it was said, by working bullocks. After alluding to the further extension of the disease in this Colony, we expressed our hope of analysing in this our final report a large number of replies to our queries. To avoid referring again to this expectation, it may be here stated that since the drawing up of our Progress Report no additional information has reached us in reply to our circulars enquiring the effect of inoculation; indeed, the very few answers received since that time lead us to believe that a decline of the disease must have then already commenced.

We enumerated the circumstances which favoured the opinion that the origin and dissemination of the disease in this Colony were mainly, if not entirely, due to communication; and we cited the opinion of many Continental writers and correspondents of the Epidemiological Society who have studied this subject, to the effect that the disease is not only contagious but capable of spontaneous development, that the mode of contagion was supposed to be by the inhalation of the air expired from the lungs of diseased animals, and that it was said to be communicated to healthy animals by the saliva and by the secretions from the nostrils of those diseased.

These points, however, we thought it desirable to submit to rigid experiment.

We reported that, although the flesh of animals affected with Pleuro-pneumonia had been extensively used as food, we found no evidence that direct injurious consequences had resulted to the consumers.

We expressed our opinion that all slaughterhouses in the neighbourhood of large towns should be brought under strict supervision.

We also suggested some measures with the object of preventing the spread of Pleuro-pneumonia through working bullocks, as a preliminary precaution, until the result of the experiments which we deemed necessary to make could be fully ascertained.

Due enquiry sufficed to assure us that it was impossible to obtain in this Colony even a small number of quiet healthy cattle which we could be certain had never previously suffered from Pleuro-pneumonia, nor had ever been exposed to any possible source of communication. As any doubt in this direction would have vitiated our experiments, we entered into arrangements for the importation of some healthy cattle from Tasmania, where Pleuro-pneumonia had not appeared.

A suitable piece of land for the depasturing of these cattle was found with some difficulty, it being necessary that the land should not have been recently occupied by stock, and that there should be no risk of other cattle coming up to the fences, and thus communicating with our imported animals.

The animals arrived from Launceston on February the 10th, and we had them landed on the

Railway Pier at Williamstown, and from the ship they were thus able to enter at once into a railway truck and be conveyed by train to the paddock previously obtained for the purpose adjoining the Railway Station at the Little River.

They were there placed under the charge of a herdsman, for whom a hut had been built on the land, and whose instructions were not to leave the ground either by night or day during the course of the experiments. Water holes were dug, and sheds were erected for certain of the cattle while under experiment, and every precaution which appeared necessary was taken to prevent any external interference with the results of the experiments.

Suggestions having been made that experiments in inoculation should be carried out in certain districts of the Colony; it was determined that a preliminary series of experiments should be first performed under the observation and control of the Commission, with the object of ascertaining the means by which the disease was communicated from one animal to the other, especially whether any of the secretions from diseased animals had the power of communicating Pleuro-pneumonia, and that before any Legislative action could be recommended it would be desirable that the results of certain experiments of a preliminary character should be ascertained.

The experiments were selected, of which we subjoin an abstract; and the healthy animals having been several times carefully examined to ensure their freedom from disease; and some diseased cattle suffering from Pleuro-pneumonia having been obtained and securely kept apart from the others, the first experiments were commenced on March 19th.

Of these experiments to determine whether Pleuro-pneumonia could be communicated to sound animals by the secretions or exhalations of diseased ones:—

Four experiments—Consisted in insertion of nasal mucus of diseased animals into the nostrils of sound ones, including one case of a cow ten days after calving, and one case of a cow in low condition, immediately after bloodletting.

Two experiments—Consisted in insertion of bronchial exudation of diseased animals into nostrils of sound ones.

Four experiments—Consisted in exposure of healthy beasts to the breath of diseased ones, so that the former must breathe the breath of the latter, including one case after a copious bloodletting. (Some of these were rather *series* of experiments, the supply of diseased animals being kept up for a considerable time as the subjects died.)

Two experiments.—Introduction of saliva of diseased animals into mouths of sound ones.

One experiment.—Injection of blood of diseased animal into subcutaneous areolar tissue of sound one.

Two experiments.—Supply to healthy animals of water from which diseased ones had been allowed to drink.

Two experiments.—Unrestricted communication of healthy with diseased animals, including one case in the open air, and one case in which the animals were both confined in a single stall of a shed.

We will not here anticipate details further than to state that in not one single case has the disease been communicated to any healthy animal under experiment.

We regard this result as of very great practical importance; for, without assuming the absolute impossibility of Pleuro-pneumonia being conveyed from a diseased to a healthy animal, it is quite evident that in the state in which the disease now exists in this Colony such consequence must at least be of extreme rarity, if it occurs at all, as the animals on which the foregoing experiments were performed have been subjected to very exaggerated tests, increasing the liability of infection far beyond what could occur under ordinary circumstances.

This result of carefully conducted experiments having for their object the direct communication of Pleuro-pneumonia from the diseased to the healthy animal, clearly shows the fallacious character of those experiments which have consisted in inoculating healthy animals and causing them to be kept in company with other animals suffering from Pleuro-pneumonia, in order thereby to judge of the efficiency of the supposed protecting means. Such experiments as these last have proceeded upon two assumptions,—first, that Pleuro-pneumonia is readily communicated from a diseased to a healthy beast,—second, that the (presumed) healthy animals were quite free from any risk of having previously acquired germs of the disease.

If we had such knowledge respecting bovine Pleuro-pneumonia as is already possessed respect-

ing some diseases of the human subject, as for instance small-pox and measles, small-pox being known to be communicable through the atmosphere for a distance of many feet, and measles by the injection of blood of a measly patient; if any approach to the exactitude of such knowledge as this could be obtained, we should then possess a ready test for the determination of the value of any supposed prophylactic.

But at present all that we are able to state with regard to inoculation, whether of fluids taken from inflamed lungs, or of matter from the tails of inoculated animals, amounts to this; that while, on the one hand, no theoretical reasoning can be brought forward nor any analogy offered in its support, so on the other hand, according to our enquiries, there is likewise a failure of evidence of an empirical nature as to its possessing any practical utility.

We have had from practical observers of stock very strong and very opposite opinions as to the value of inoculation; but it is on all sides admitted that it does not confer an absolute protection.

We have not been able to avoid the observation, that the operators in inoculation who have come forward to state their experience, have each (as a rule) laid great stress on his own method of taking the matter and performing the operation as the only effectual plan, and these methods have widely differed, yet according to his own statement the success of each seems to have been all he could have wished.

According to Dr. Headlam Greenhow*, "inoculation was tried in England in the eighteenth century, but probably for 'Rinderpest' or Steppe Murrain, which is said to occur only once in the same animal, and to be communicable by means of inoculation. The inoculation was performed with matter taken from the running of the nose, mouth, and eyes."

The same writer has the following apt remarks on this subject: we quote the passage verbatim:—

"Admitting pulmonary murrain to be contagious, it is contrary to all analogy that the specific virus of the disease (allowing the fluid squeezed out of the diseased lungs to be such) should not exert its influence on those organs which are the normal seat of the disease.

"Whether a person inhales the small-pox contagion with his breath, or has it inserted into the surface of his body by means of a lancet, is immaterial as regards the seat of the consequent local affection. In either case the characteristic symptoms of small-pox present themselves on the skin.

"The same rule applies in other contagious diseases. It also applies to common as well as to morbid poisons. However introduced, arsenic affects the stomach and cantharides the kidney.

"It might reasonably be expected to hold good in pulmonary murrain, if the inoculation really possessed any specific effect apart from the local injury sustained. It is admitted, that when pulmonary murrain does occur, after what is termed a successful inoculation, its course and severity are uninfluenced by the preceding inoculation. This circumstance is altogether at variance with the pathological fact upon which inoculation is based, namely, that the organism having once passed through certain contagious diseases, either is thereby rendered altogether insusceptible of being affected by the contagion in future, or subsequently undergoes the disease in a very mitigated and comparatively harmless manner. Isolated and rare exceptions only occur to this rule."

One witness, who gave evidence before the Commission, mentioned an instance where a herd of cattle being infected with Pleuro-pneumonia, it was resolved that they should be inoculated: but owing to some delay or other cause, inoculation was not performed, yet from that time no new cases occurred in the herd. Now, if the proposed inoculation had taken place, the sudden cessation of the disease would, no doubt, have been improperly attributed to the effect of that operation.

A knowledge of the possible occurrence of instances of this nature goes far to account for the conflicting opinions prevalent among owners of stock as to the power of inoculation.

For details of the morbid anatomy of Pleuro-pneumonia we refer to our progress report, and to the histories of the *post mortem* examinations which we have caused to be performed.

We desire here to point out the fact that the morbid appearances are now of a less severe character than those observed when the disease was first introduced into this Colony,—that whereas at that time extensive gangrene and grey hepatization of the lung were not unfrequent, now the stage of red hepatization is not often passed.

Out of seventeen diseased animals, which we had under observation, at least four have either recovered or been in progress of recovery; the *post mortem* examinations of these animals were made almost immediately after a physical examination of each animal during life. It is thus proved that

* Report on Murrain in horned cattle, &c., by E. Headlam Greenhow, M.D. London, 1857.

the natural cure consists in organization of the coagulable lymph effused into the connective tissue of the lung. An imperfect dense fibro-areolar tissue is formed in great quantity in and around the lung, the lobules of which waste partly, in consequence of the pressure to which they are subjected by this adventitious contracting web. Thus the animal recovers, with a lung more or less atrophied.

As might be expected, points of resemblance may be traced between Pleuro-pneumonia and other local inflammations attended by fever, whether the fever be primary or merely the consequence of the local inflammation, and whether our observations are conducted on the human subject or on brutes. Whatever hypothetical view may be taken of the nature of Pleuro-pneumonia, an inflammation either of the substance of the lung, or of the pleura, seems to be an essential part; indeed, we nearly always find inflammation of both these textures. In any given case, until there are physical signs referable to the lung or pleura, it is impossible to decide with confidence that Pleuro-pneumonia exists. A very marked yellowness of the skin is a not unfrequent symptom, and this has been observed to disappear when the animal was recovering, but neither desquamation of the cuticle nor faucial injection have been detected as symptoms of Pleuro-pneumonia in the animals which we have had examined.

Dr. Greenhow, before quoted, has the following remarks:—"Pulmonary murrain has resemblances with both hooping cough and influenza in the human subject; like hooping cough, it is at once epidemic and contagious. Pathologically, it has a much closer affinity with influenza than with hooping cough, but differs from both in its inflammatory character; inflammation which appears to be inseparable from pulmonary murrain, being only a complication in these human diseases."

Acephalocysts having been frequently found in animals affected with Pleuro-pneumonia, and also in a few cases *Echinococci*, *Strongyli*, and *Distomata*, it may be asked whether any of these parasitic animals cause this disease?

In reply to this question we may state, first, that in many cases of Pleuro-pneumonia no parasites have been found, although carefully looked for by us; and secondly, that they have each been observed in animals which had no Pleuro-pneumonia. Further, in a diseased animal, which we caused to be examined after death, such parasites were found in the healthy lung, while the inflamed lung did not contain them.

Parasites can only act as local irritants, or as drainers of nutriment; if they were sufficiently important to cause death in either of these ways, we should not expect that there would be any difficulty in their detection.*

From the diminished severity of the lesions observed in the bodies of animals which have lately died of Pleuro-pneumonia, from the greater frequency of recoveries, and, as it appears, the comparatively small number of animals now becoming attacked, the hope may be reasonably entertained that the disease will at length entirely disappear here as it has done before now in other places.

This consideration, added to the striking result of our carefully conducted experiments, in which all our attempts to communicate the disease from one animal to another left the health of the sound animal uninjured, leads us to think it undesirable in the present state of things that there should be any Legislative action taken in the matter.

The essential nature of bovine Pleuro-pneumonia is as obscure as that of cholera, influenza, diphtheria, and many other diseases of our own species, so much more easily investigated, and which yet, after so vast an amount of patient and laborious investigation by men of the most acute intellect, remains a mystery.

Indeed, to attempt the solution of a problem, to all appearance so mysterious, would, as we believe, in the present state of knowledge, be but a profitless misapplication of labour of a public commission.

All that we have been led to regard as the proper object of scientific investigation is, the conditions under which the phenomena of the disease present themselves, and accordingly to certain of these conditions we have confined our line of research.

* On the 2nd of December, since this report was drawn up, a paper of evidence (dated 23rd of September) was submitted to the Commission by Mr. Ralph, in which he announces his belief that animals with Pleuro-pneumonia have either Hydatids in the liver or Distoma in the hepatic ducts; and the cysts, sometimes assuming the *Echinococcus* form, he believes to be due to Distoma; and that the contents of Distoma cysts (ova, cells, &c.) may be introduced by inoculation to the system, and so produce Pleuro-pneumonia. Bodies resembling some of the contents of the cysts being occasionally found in the blood, and constantly in the lung. As, however, Distoma were known long before Pleuro-pneumonia, and in many animals which have never shown any affection like this disease, the Commission is of opinion that not only no connection in the way of cause and effect between the appearances referred to and the disease has been shown, but that any such connection is, for many reasons, in the highest degree improbable.

The result of our enquiry appears, however, to have a clear and direct practical bearing, and we hope that our labours will be found to have supplied reliable information for the Government of the Colony, tending to discourage Legislative interference with owners of cattle, and inasmuch as we having now proved by our carefully conducted experiments that the disease is not likely to be communicated by any of the means formerly supposed to spread the contagion, viz., the inhalation of the breath of diseased beasts, contact with them, drinking from the same vessel, contact of the secretion from the mouth and nose of diseased beasts with the corresponding parts of healthy animals; we point out that the action of Government in declaring certain districts clean or unclean, inspecting stock supposed to be diseased, destroying diseased animals, and obstructing the transfer of cattle from one district to another, is unnecessary and undesirable, as only entailing loss and inconvenience, without any reasonable probability of stopping the spread of the disease. Before our experiments were made, such action would, of course, be a proper preliminary precaution for the protection of the holders of clean stock in the Colony.

Our investigations showing the innocuous character of the flesh for food when having the appearance of ordinary meat in the butchers' shops, removes the necessity for new Legislative action in this respect also.

In all these, our conclusions, it is satisfactory to find ourselves in accord with the most recent information laid before the Imperial Parliament.

We annex to this report the details of experiments alluded to above.

FREDERICK McCOY, *Chairman.*

THOS. BLACK, *M.D.*

JAMES T. RUDALL, *F.R.C.S.*

THOMAS SHEARMAN RALPH, *M.R.C.S., England.*

*Offices of the Pleuro-pneumonia Commission,
Old Treasury, Queen-street, Melbourne,
12th December, 1864.*