

(No. 25.)



1875.

T A S M A N I A.

H O U S E O F A S S E M B L Y.

C O N F E R E N C E O F I N S P E C T O R S O F S T O C K.

R E P O R T.

Laid upon the Table by the Attorney-General, and ordered by the House to be printed, July 27, 1875.



Inspector of Sheep Office, 21st December, 1874.

SIR,

I HAVE the honor to forward herewith a copy of the Report of the Conference of Inspectors of Stock held at Sydney in the month of November.

The Report very fully sets forth the action of the Conference, and contains the views and opinions entertained by its members on the several important subjects submitted for their consideration. I think it desirable, however, that I should call your attention, and the attention of the Government, to some of the Resolutions of the Conference, and the suggested legislation which will be required if those resolutions are adopted by the Government of Tasmania, as I believe they are likely to be by all the other Governments represented at the Conference.

You will observe that the Conference recommend that the existing prohibition regarding the importation of stock be renewed and "maintained until it is ascertained that no foot or mouth disease, rinderpest, nor sheep-pox, nor any other infectious or contagious disease in stock not known in Australia exists in Great Britain and Ireland, when importations might be allowed on conditions set forth in No. 3, page 5," under the head of "Suggestions for regulating the importation of Stock from places outside the Australian Colonies."

The reasons for arriving at this conclusion are given in the Report, and with those reasons I heartily concur. When we consider the magnitude of the interest which would be affected by the introduction of foot and mouth disease, rinderpest, or sheep-pox into the stock of Australia, it seems to me that it would be the height of folly to run any unnecessary risk at the present time.

I observe that some of the newspapers have remarked upon the fact that the members of the Conference were not unanimous upon this question, and, without explanation, this might lead to the impression that some of them were opposed to the continuance of the prohibition. The members of the Conference were unanimously of opinion that for the present the prohibition should be continued, and only slightly differed as to the mode of carrying it out, as explained in the Report, and more fully shown in the Report of the Proceedings at pages 12 and 13.

Under the head of "Appointment of Border Quarantine Stations," No. 5, page 7, you will observe that a great barrier to the intercolonial stock trade is proposed to be removed by the establishment of quarantine stations on the Murray River, and at Apsley, on the border of South Australia and Victoria.

In connection with this subject I may also refer to the proposed reduction of time sheep shall in future be kept in quarantine. The time at present is 60 days; and sheep, by sea, cannot enter New South Wales excepting at the port of Sydney. A majority of the Conference recommended that 60 days be reduced to 14 days, but as the representatives of New South Wales and Queensland opposed this and would only agree to a reduction of 30 days, I fear that, until scab is eradicated entirely from Victoria and Tasmania, we shall have to be content with a quarantine of 30 days on the Murray, and at Sydney and Queensland.

Even this, however, will prove a great boon to Tasmanian breeders of sheep. At present sheep from Tasmania can only enter New South Wales at the Port of Sydney, and there undergo a quarantine of 60 days, with two dressings. Now they will be allowed to go by rail from Melbourne to Moama and Albury, on the Murray, and undergo a quarantine of 30 days,—presently to be reduced to 14 days.

To illustrate the value of this concession on the part of New South Wales, I may mention that when I was at Sydney I saw sheep in the Quarantine Yards there which had been taken from Tasmania to Melbourne, where they had been purchased by settlers in the southern districts of New South Wales. These sheep had then to be taken round by sea to Sydney, and after undergoing

quarantine there had to be travelled by land 400 or 500 miles south towards the Victorian border. Under the proposed establishment of quarantine stations on the Murray, sheep may go from Tasmania to stations in Riverina and the southern districts of New South Wales *viâ* Melbourne, and thence by rail to Moama and Albury.

Under the head of "Scab in Australia," No. 6, page 8, you will observe that the Conference recommend that after the 1st January, 1876, all sheep found scabby in Australia be destroyed under a system of compensation to owners indicated in No. 4, page 6, under the head of "Principles for intercolonial regulations for the extinction of infectious or contagious diseases in Stock, and the conduct of the Stock traffic between the different Colonies."

Some of the representatives of the other Colonies were desirous of carrying out this at once, but to that I could not give my assent.

I do not think that any scabby sheep will exist in Tasmania on 1st January, 1876; and certainly, if there should be any then, it would be for the interest of the sheepowners they should be destroyed, and the runs left vacant for a time in order to secure the destruction of crawlers and stragglers.

In Victoria I believe it will be found necessary to destroy more than one flock where the sheep are depastured on large rough runs in a broken country; such, as I am informed, is the nature of the runs in Victoria where scab still exists.

With regard to the proposed action for the suppression and prevention of pleuro-pneumonia, it may be considered by those who have not given any attention to the subject that, as we have not yet got that disease in our cattle in Tasmania, it is premature to legislate further on the subject.

It is true that the cattle owners of Tasmania have hitherto escaped what has indeed proved a scourge to their brethren in the Continental Colonies of New South Wales, Victoria, and Queensland; but it is equally true that the disease may be introduced any day by cattle imported from New South Wales, where the disease is so rife that very few districts are wholly free from it.

This being so, I would strongly urge upon the Government the propriety of carrying out the Resolutions of the Conference with reference to pleuro-pneumonia; so that, in the event (a very probable one) of the disease being introduced into Tasmania, the necessary means shall be in existence to stamp it out at once before it can spread into the interior.

In connection with this subject I may observe that, in the opinion of the most competent authorities I had an opportunity of consulting in New South Wales, the measures recently adopted here for isolating cattle arriving by sea, is the only reasonable security against the introduction of the disease.

I make these observations on pleuro-pneumonia principally because I have observed that a discussion took place in the Hobart Town Municipal Council on a report which characterised the recently increased restrictions with reference to the ingress and egress of Colonial cattle at the Slaughter Yards as unnecessary,—as their Inspector of Stock had stated there was no danger of disease being introduced by cattle from abroad. It was also stated by one of the Aldermen, at the same meeting, as an argument in favour of the relaxation of the restrictions at the Slaughter Yards, that they deprived the Corporation of about £200 per annum, arising from fees on Colonial cattle, which would be sold outside the city unless the existing restriction is removed; and an intention was expressed of petitioning the Government to rescind the Proclamation.

I trust that the prayer of any such petition will not be acceded to so long as we import cattle from New South Wales and Victoria, while pleuro-pneumonia exists in the herds of those Colonies. It is better that the Hobart Town Corporation should be deprived of £200 per annum of its former revenue, arising from the Slaughter Yards, than that any risk should be run of introducing a disease into the cattle of the Colony which would, (if we are to judge by results in New South Wales and Queensland), inevitably carry off between 30,000 and 40,000 head of our horned cattle stock.

All the resolutions were adopted after the most careful and dispassionate consideration of what was deemed to be best for the general interest of stockowners and the public at large; and I believe that carrying out these Resolutions by legislation as early as possible will be conducive to the material interests of all the Colonies, and to none more than to Tasmania.

I look upon it as an absolute necessity for this Colony to accept the conclusions of the Conference as a basis for legislative action next Session of Parliament, if we would preserve and extend our export trade in sheep and cattle to the neighbouring Colonies; and I look upon that trade as being now only in its infancy. To what extent it may be developed will depend upon the energy and skill of those who have in the past turned their attention to improved breeding, from which they are now reaping a rich reward, as well as those who are only beginning to discover that the breeding of stud sheep, cattle, and horses is a paying speculation, well worth following out by the investment

of capital, and the bestowal of that amount of energy and skill which are absolutely essential in order to attain profitable results. I would respectfully suggest that the Government of Tasmania should, with as little delay as possible, signify to the other Australian Governments, parties to the Conference, what its views and intentions are regarding the recommendations contained in the Report; and I think that if the Governments of the five Colonies represented at the Conference unanimously agree to introduce the requisite measures to the several Parliaments, there can be very little doubt about New Zealand and Western Australia giving their adhesion to the same or similar regulations.

You will observe that the Conference's last suggestion is that the Colonies of New Zealand, Western Australia, and Fiji should be invited to consider the opinions expressed and the Resolutions agreed to at the Conference with a view to their adoption.

With these observations I beg leave to submit the Resolutions of the Conference to the consideration of the Government, and in doing so, in the language of the Report, would earnestly express a hope that the Governments of the several Colonies will take measures as soon as possible to carry them into effect.

I have the honor to be,
Sir,

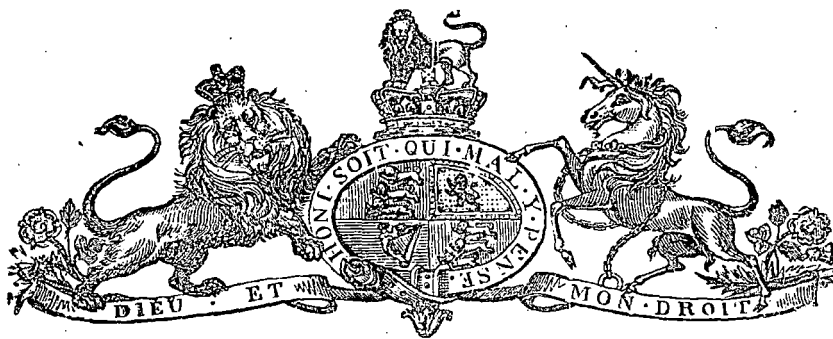
Your obedient Servant,

JAMES WHYTE,

Chief Inspector of Sheep.

The Hon. T. D. CHAPMAN, Colonial Secretary.





*CONFERENCE of the CHIEF INSPECTORS of STOCK for the Australian Colonies, held
in Sydney in November, 1874.*

REPORT OF THE PROCEEDINGS OF THE CONFERENCE.

THE Conference was convened, at the instance of the Government of New South Wales, to consider the best means to be adopted for securing joint and simultaneous legislative action, on the part of all the Australian Colonies, in dealing with Infectious and Contagious Diseases in Stock.

The under-mentioned Colonies were represented :—

<i>New South Wales :</i>	MR. ALEXANDER BRUCE.
<i>Queensland :</i>	MR. P. R. GORDON.
<i>South Australia :</i>	MR. C. J. VALENTINE.
<i>Tasmania :</i>	THE HONORABLE JAMES WHYTE
<i>Victoria :</i>	MR. E. M. CURR.

Mr. Bruce having been appointed the Chairman of the Conference, laid before the Members a Statement of proposed proceedings, which was unanimously adopted, and ordered to be printed, to form portion of the proceedings.

After mature deliberation, the Conference agreed to the Resolutions submitted herewith on the under-mentioned subjects :—

- (1.) Definition of Terms.
- (2.) Pleuro-pneumonia.
- (3.) The importation of Stock from places beyond the Australian Colonies.
- (4.) The extinction of Infectious and Contagious Diseases in Stock, and the conduct of the Stock Traffic between the different Colonies.
- (5.) The appointment of Quarantine Stations.
- (6.) Scab in Australia.
- (7.) Inspection Fee on Stock.
- (8.) Catarrh in Sheep.
- (9.) Foot-rot, Worms, and Fluke.
- (10.) Overstocking.
- (11.) Stock Statistics.
- (12.) Experiments for ascertaining the nature, cause, prevention and cure of Diseases in Stock.
- (13.) Co-operation of other Colonies invited.

In reporting these Resolutions, the Conference would earnestly express a hope that the Governments of the several Colonies will take measures, as soon as possible, to carry them into effect.

The Conference have considered it their duty to recommend the continuance of the existing prohibition on the importation of stock, with the exception of horses, and the extension of such prohibition until it shall be ascertained that certain diseases not now in Australia have been eradicated in Great Britain, when importations from thence may be resumed, under strict quarantine regulations, the nature of which are indicated in the proceedings of the Conference.

On reference to these proceedings, it will be observed that the Members of the Conference were not unanimous in opinion as to the mode of carrying out an extension of the prohibition. Mr. Curr desired to go further than the resolution arrived at by the majority, and thus continue prohibition until all infectious and contagious diseases, except scab, shall have ceased to exist in Great Britain.

Mr. Bruce was of opinion that importations from Great Britain alone might be admitted, when it has been ascertained that there are no cases of foot and mouth disease, or only a few isolated ones, and no rinderpest or sheep-pox, nor any other infectious or contagious disease in stock not known in Australia.

Mr. Valentine proposed determining the period for which the existing prohibition should be enforced.

Considering the magnitude of the interest involved, and the frightful results that must inevitably follow the introduction of rinderpest, foot and mouth disease, or sheep-pox, into the flocks and herds of Australia, and in view of recent fresh outbreaks of foot and mouth disease in Great Britain, the Conference has come to the conclusion that, for the present, the only safe and prudent course is to continue the prohibition, and watch the course of events there with reference to the suppression of infectious and contagious diseases.

In arriving at this conclusion, the Conference has been influenced by the consideration that foot and mouth disease, if introduced into the stock of Australia, would prove infinitely more destructive than it has done in England, where each individual case can be and is attended to with as much care as would be bestowed upon human beings; whereas in the Colonies any such course of treatment would be altogether impracticable.

The Resolutions arrived at were in most cases unanimously agreed to, but when any difference of opinion existed, it will be made apparent by reference to the proceedings herewith submitted.

The Conference would also draw the attention of the respective Governments to the papers on Pleuro-pneumonia, Scab in Sheep, Catarrh, Fluke, Worm Disease, and Foot-rot, and suggest that publicity should be given to them in such manner as may be deemed most expedient, more particularly for the purpose of stimulating inquiry into the subjects of Fluke, Worms, and Foot-rot.

Many other matters will be found in the proceedings of much interest to stockowners and the public, although the Conference does not consider it necessary to enumerate them in the Report.

In concluding the labours of the Conference, Mr. Bruce, as Chairman, begged to express to the Members of the Conference, on his own behalf, as well as on behalf of the Government of this Colony, his thanks for the careful and attentive consideration they have given to the subjects submitted to them, which he trusted would result in lasting benefit to the respective Colonies.

Votes of thanks were then heartily accorded to the Chairman and Secretary.

ALEX. BRUCE.
P. R. GORDON.
C. J. VALENTINE.
JAMES WHYTE.
E. M. CURR.

RESOLUTIONS PASSED BY THE CONFERENCE.

1. Definition of terms—"disease," "infected," and "Stock."
 2. Pleuro-pneumonia.
 3. Regulating the importation of Stock from places outside the Australian Colonies.
 4. Principles for Intercolonial Regulations for the extinction of Infectious or Contagious Diseases in Stock, and the conduct of Stock Traffic between the different Colonies.
 5. Appointment of Quarantine Stations.
 6. Scab in Australia.
 7. Inspection Fee on Stock.
 8. Catarrh in Sheep.
 9. Fluke, Foot-rot, and Worms.
 10. Overstocking.
 11. Stock Statistics.
 12. Experiments with the view of ascertaining the nature, cause, prevention and cure of Diseases in Stock
 13. Co-operation of the other Colonies invited.
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No. 1.

DEFINITION OF TERMS.

That "disease" shall mean the diseases specified in the Programme of Proceedings of the Conference calling for legislative interference, as well as any other disease which the Governor in Council may declare to be an infectious or contagious disease for the purposes of the Act.

That "infected" shall mean and apply to stock actually suffering from or affected with any such infectious or contagious disease, or which have within the next preceding six months been in direct or indirect contact with stock so suffering or affected, or been dressed or dipped for scab within that period, and one infected animal in a mob is held to render the mob or flock infected.

That "stock" shall mean horses, cattle, sheep, goats, and pigs, and any animal whatsoever that the Governor in Council may declare to be subject to the provisions of the Act.

No. 2.

PLEURO-PNEUMONIA.

LEGISLATION SUGGESTED.

1. That every mob of cattle which has become infected be inoculated when the virus can be obtained in the mob or in any cattle within a practicable distance.

2. That owners give notice of every outbreak of the disease to their neighbours, to Inspectors, and to the public.

3. That no inoculators but those authorised by the Government be allowed to inoculate for others.

4. That properly inoculated cattle depasturing on a run, on the expiry of *six weeks* from the last case of disease, be allowed to leave the run and to pass over infected ground without being deemed infected.

5. That all travelling cattle actually affected with or suffering from pleuro-pneumonia be killed immediately they are found to be so.

6. That if the travelling cattle in which any animal is thus found to be actually affected be fat stock, they be taken by day to their destination by the roads least likely in the opinion of an Inspector to spread the disease, and timely notice be given by their drovers to all owners of horned stock on or near the road that the mob is infected.

7. That where the travelling cattle in which any animal is thus found to be actually affected with pleuro-pneumonia are store stock, they be stopped and inoculated as soon as practicable, and afterwards taken to their destination, as provided for in the next preceding regulation; but such cattle be not required to travel more than six miles a day for the first thirty days after being inoculated.

8. That in Colonies in which pleuro-pneumonia exists, the owner of travelling cattle give notice of his intention to cross or pass along runs where stock of the same description are kept, if the road be not separated from the run by a sufficient fence.

9. That drovers do not abandon any travelling stock, nor leave the carcasses of any stock which may die undestroyed.

No. 3.

SUGGESTIONS FOR REGULATING THE IMPORTATION OF STOCK FROM PLACES OUTSIDE THE AUSTRALIAN COLONIES.

1. That the existing prohibition against the introduction of all stock, except horses, from places outside the Australian Colonies, be allowed to stand.

2. That, with the view of keeping the respective Governments informed on the subject, their Agents-General be instructed to obtain from the Secretary of Her Majesty's Veterinary Department, London, a monthly report as to what infectious and contagious diseases then exist among the live stock of the United Kingdom, and to what extent they are each known to prevail; and that the Agents-General transmit this report by mail, and when necessary by telegram, to their respective Governments.

3. That on the expiry of the existing prohibition it be again renewed, and maintained until it is ascertained that no foot and mouth disease, rinderpest, nor sheep-pox, nor any other infectious or contagious disease in stock not known in Australia exists in Great Britain and Ireland, when importations might be allowed under the conditions hereinafter mentioned* :—

* The Conference were not unanimous on this Resolution.

- (1.) That the introduction of all stock except horses shall be absolutely prohibited from all other Countries, except Great Britain and Ireland, and also from all Colonies except those agreeing to these regulations.
- (2.) That when importations from the United Kingdom are renewed, all stock intended to be introduced from thence into Australia be examined at the port of shipment by a duly qualified veterinary surgeon, appointed conjointly by the Agents-General for the several Colonies, who shall make a declaration that to the best of his knowledge and belief such stock are free from any infectious or contagious disease.
- (3.) That the live stock (if any) for the use of the passengers put on board the same ship as the stock intended to be introduced into the Colonies, be examined by the same veterinary surgeon, and certified in like manner to be also free from infection.
- (4.) That every ship from places beyond the Australian Colonies, on arrival there, be boarded by an Inspector, and all stock intended to be landed from such ship, previous to being so, be examined by a duly qualified veterinary surgeon, or medical man when a veterinary surgeon cannot be obtained.
- (5.) That if such stock, or any stock whatever on board such ship, be found to be infected with any infectious or contagious disease not already introduced into any of the Colonies, all such stock be forthwith destroyed.
- (6.) That if apparently free from disease not known in the Colonies, the stock intended to be landed be disinfected on board ship, and conveyed to a thoroughly isolated quarantine, to be there properly disinfected and to undergo a probationary detention, at the owner's expense, of fifty days at least.

No. 4.

PRINCIPLES FOR INTERCOLONIAL REGULATIONS FOR THE EXTINCTION OF INFECTIOUS OR CONTAGIOUS DISEASES IN STOCK, AND THE CONDUCT OF THE STOCK TRAFFIC BETWEEN THE DIFFERENT COLONIES.

I.—INFORMATION TO NEIGHBOURING COLONIES.

1. That the Chief Inspector in each Colony communicate by telegraph full and distinct information as to the position, extent, and nature of every outbreak of infectious or contagious disease in stock, as quickly as possible, to the Chief Inspectors of the other Colonies.
2. That the Inspectors in the border districts be instructed to send immediate information by telegram to the nearest Inspectors of the neighbouring Colonies of every outbreak of such disease which occurs within fifty miles of the border.
3. That the road by which the disease was introduced, and the history of the outbreak, as well as the possibility of its extension, are to be carefully examined into, and the Inspectors for the districts into which this road leads in the neighbouring Colonies are to be always put in possession of these particulars with the least possible delay.
4. That every Colony in which any such disease exists shall publish quarterly in the Government *Gazette* a report upon the state of the disease, what prohibitory measures have been issued, their alteration or rescindment.
5. That this report be sent direct to the Chief Inspectors for the different Colonies.

II.—MEASURES FOR THE ERADICATION OF DISEASE.

6. That a Fund to be called the Stock Fund be raised by a contribution on stock, to defray the payment of compensation and other expenses incurred in the prevention and extinction of infectious diseases in stock.
7. That each Colony forthwith initiate such measures as shall effect the speedy extinction of all infectious or contagious diseases in stock which are controllable by quarantine, and shall take such measures with respect to all these diseases not so controllable as shall prevent their spread and tend to their gradual extinction.
8. That while provision should be made in all such measures for the punishment of owners who keep or move infected stock to the detriment of others,—the means chiefly to be relied upon for the eradication of disease should not be the enforcement of penalties, but the initiation and maintenance of such a system of inspection as will ensure the discovery by the authorities and the public of every outbreak of disease *immediately it is observable*, with the view to the infected stock being at once placed in quarantine, and steps taken for the speedy eradication of the infection, on the ground where the outbreak occurs.
9. That in order to remove every inducement to the owners of infected stock to conceal the fact of their being so, all animals killed and goods destroyed by order of the Government, for the purpose of suppressing disease, be paid for by the Government, at a rate equal to their value at the time they are destroyed; and the expenses incurred in destroying such stock or goods be also borne by the Government.

10. That all conveyances which have served for the transport of live stock, and all fittings and articles which have been used by or with such stock, and from which there is any risk whatever of infection spreading, shall be disinfected before being again used ; as well as all conveyances, fittings, and articles which have served or been used in the transport of manure, fodder, litter, or other matters which have had their origin or been in contact with animals suspected of disease.

III.—CONDUCT OF INTERCOLONIAL STOCK TRADE.

11. That where there is no infectious or contagious disease in the stock of any two or more Colonies, nor any risk of infection being conveyed, such stock be introduced *overland*, from one Colony to the other, without being obliged to cross at specified crossing-places or to wait for inspection ; and sheep arriving by *sea* from a Colony in which no scab exists, undergo a quarantine of fourteen days with two (2) dressings.

12. That where an outbreak of disease occurs in any Colony, the neighbouring Colonies may, pending the extent and risk of the outbreak being definitely ascertained, at once issue a prohibition against the introduction of stock from such Colony ; and the duration of such prohibition shall depend upon the amount of risk arising from such outbreak.

13. That if it be clearly shown that the outbreak in such Colony is only an isolated one, or only of a limited extent, and confined to only one or two districts, and that the measures for isolation and extinction are there being effectually carried out—in that case the stock from the remaining non-infected portions of such Colony, situated at a safe distance from any spot where infection exists, may be introduced into the neighbouring Colonies under the following conditions ; namely,—

1. *As regards all stock,—*

- (1.) That they are admitted at appointed crossing-places only.
- (2.) That the stock be accompanied by a certificate from the Inspector of the District from which they started, containing the following particulars :—(a.) Whether or not the stock are infected. (b.) The place from which they started. (c.) The nearest infected stock to such place. (d.) The nature and extent of the disease affecting such stock. (e.) The route by which the stock intended to be introduced are to travel to the crossing-place. (f.) The nearest infected stock to any portion of such route.
- (3.) That they are inspected at such place previous to crossing or landing, and be found to be apparently sound.

2. *As regards sheep,—*

- (4.) That when introduced overland they be branded with a letter, to indicate the Colony from which they are to be introduced,—say N for New South Wales, Q for Queensland, A for South Australia, and V for Victoria.
- (5.) That where they are conveyed by train, the trucks in which they are carried shall have been thoroughly cleansed and disinfected, to the satisfaction of the Inspector, previous to the sheep being put into them ; and when introduced by water, that the portion of the vessel where they are to be penned shall have been cleansed and disinfected in the same way.
- (6.) That sheep proposed to be introduced by land into any Colony undergo a quarantine of fourteen days within the border of such Colony, and during that period be dipped not less than twice to the satisfaction of an Inspector ; but the conditions contained in this suggestion may be modified by any two Colonies by mutual agreement.*
- (7.) That they do not leave the quarantine until the Inspector in charge shall certify that they are free from disease.

14. That all certificates shall state for how long they are available.

15. That when any disease is equally prevalent in the cattle stock of two or more Colonies, these Colonies allow cattle to cross their borders without compelling them to do so at specified crossing-places, or to wait for inspection.*

16. That the trade in thoroughly dry skins, bones, horns, hoofs, melted tallow in casks or skins, cow-hair, and goats' hair, in so far as these latter objects are packed in sacks or bales, as well as straw, hay, and other substances, between a non-infected and an infected Colony, be exempt from the operation of these suggestions.

17. That a Colony be not bound to compensate for any stock which may be attacked by disease and have to be killed, if such stock have not been the preceding sixty days at least within such Colony, unless it can be proved that the infection took place in the Colony itself.

* The Conference were not unanimous in this Resolution. See Proceedings.

No. 5.

APPOINTMENT OF BORDER QUARANTINE STATIONS.

1. The Conference is of opinion that it is desirable that quarantine stations for the admission of sheep from Victoria and Tasmania into New South Wales should be established without delay at Moama and Albury, inasmuch as the present restrictions operate most prejudicially to the interests of sheepowners in

Riverina, Victoria, and Tasmania, without being at all necessary on sanitary grounds, because the same precautions which are now taken against the introduction of disease at the port of Sydney may as easily be observed at quarantine stations on the river Murray.

2. The Conference is also of opinion that a quarantine station should be established at or near Apsley, on the borders of South Australia and Victoria.

No. 6.

SCAB IN AUSTRALIA.

That while acknowledging the magnitude of the undertaking of eradicating scab in Victoria (where the number of infected sheep at one time exceeded 5,000,000) and the innumerable difficulties encountered in carrying out the work, as well as fully appreciating the progress already made in that direction, there being now only about 120,000 sheep in quarantine in that Colony, as well as the fact that nearly the whole of the sheep in Tasmania, amounting to 1,700,000, once infected, have now been reduced to 27,000, —this Conference is of opinion that it is most desirable that all sheep henceforward found scabby in Australia, as well as the flocks in which they are found running, should be destroyed as soon as practicable, but in no case later than the 1st January, 1876.

The reasons that induce the Conference to pass this resolution are the following :—

- (1.) The existence of scab in any of the Colonies is a source of real danger to the flocks in the other Colonies.
- (2.) It entails very great expense on some of the Colonies, and a considerable amount on them all, in the protection of their sheep from infection.
- (3.) It puts a stoppage to free trade in sheep in Australia, and thus causes very heavy losses to all the other Colonies, not only through preventing the trade in store and breeding sheep, but also in the impediments it throws in the way of the introduction of improved stud sheep from one Colony to another.
- (4.) The immense losses that are sustained by all the other Colonies through the existence of scab in Victoria and Tasmania, in various ways, even when the disease is not allowed to spread beyond these Colonies.

These considerations are altogether irrespective of the incalculable losses sustained by Victoria and Tasmania through the continued existence of scab within their own borders.

No. 7.

INSPECTION FEE ON STOCK.

That it is undesirable that any inspection fee be charged by one Colony on the stock introduced from another Colony, inasmuch as such a charge would tend to prevent the initiation of uniform legislation and combined action by the different Colonies for the eradication of disease.*

* The Conference were not unanimous in this Resolution.

No. 8.

CATARRH IN SHEEP.

The Conference advise that all sheep infected with catarrh be destroyed.

No. 9.

FOOT-ROT, WORMS, AND FLUKE.

That although the Conference expresses no opinion on the paper submitted by Mr. Valentine respecting the destruction in South Australia of sheep affected with fluke, they consider that it is unjust towards those owners whose sheep are free from such diseases as foot-rot, worms, and fluke, and especially to those whose country is not decidedly safe from infection (and they amount to about 30 per cent. of the whole), that sheep infected with any of these ailments should be allowed to travel over such country and infect sound sheep ; but that with the information at present before them, they are not yet prepared to say how the evil should be met by legislation.

No. 10.

OVERSTOCKING.

That this Conference desires to point out that the system of overstocking, so generally carried out over the whole of the Colonies, has had a most injurious effect on the pastures and stock ; that it has reduced the size and injured the constitution, and is a great source of disease in stock generally.

No. 11.

STOCK STATISTICS.

That the several Governments be invited to take power, where they do not possess it, to obtain returns from owners of the number of their stock and of all diseases affecting them.

No. 12.

EXPERIMENTS WITH THE VIEW OF ASCERTAINING THE NATURE, CAUSE, PREVENTION AND CURE OF DISEASES IN STOCK.

That the several Governments be invited to follow the example of Queensland, and authorise the expenditure of a sum of money for the purpose of meeting the expense of making the experiments for ascertaining the nature, cause, prevention and cure of diseases in stock ; and that the Chief Inspectors for the different Colonies regularly transmit the results of these experiments to each other, and otherwise compare experience.

No. 13.

CO-OPERATION OF THE OTHER COLONIES INVITED.

That, although the Colonies of New Zealand, Western Australia, and Fiji are separated by long distances from the Colonies represented at this Conference, they should be invited to consider the opinions expressed and the Resolutions agreed to at the Conference, with a view to their adoption.

ALEX. BRUCE.
P. R. GORDON.
C. J. VALENTINE.
JAMES WHYTE.
E. M. CURR.

MINUTES OF PROCEEDINGS of the CONFERENCE of the CHIEF INSPECTORS of STOCK for the several Australian Colonies herein specified, held at the Office of the Chief Inspector of Stock, Sydney, in November, 1874.

Office of the Chief Inspector of Stock, Sydney, 10th November, 1874.

THE under-mentioned gentlemen were present, and represented the Colonies named respectively :—

<i>New South Wales :</i>	MR. ALEXANDER BRUCE.
<i>Queensland :</i>	MR. P. R. GORDON.
<i>Tasmania :</i>	THE HONORABLE JAMES WHYTE.
<i>Victoria :</i>	MR. E. M. CURR.

Mr. Bruce informed the Conference that Mr. Valentine, the Representative of South Australia, would arrive by steamer to-day.

Mr. Whyte moved, and it was unanimously agreed to, that Mr. Bruce be appointed Chairman.

The Conference agreed to meet daily at $\frac{1}{2}$ past 10 o'clock A.M., Saturday excepted ; also, that the proceedings should not for the present be made public, except in so far as the Conference might consider to be necessary.

It was then resolved that the Secretary should prepare Minutes of each day's proceedings, which shall be read over and confirmed at the next sitting prior to any other business being entered upon.

The Chairman laid on the Table a copy of the letter forwarded by the Government of New South Wales to the Governments of the other Colonies calling the Conference ; also a short paper setting forth the reasons for taking that course ; and submitting a Programme of Proceedings for consideration, which was adopted by the Conference. (See Papers Nos. 1 and 2, *infra*.)

The under-mentioned papers were then laid before the Conference, and directed to be printed :—

Mr. Bruce, on Pleuro-pneumonia.	} See papers appended.
Mr. Gordon, on Worms.	
Mr. Whyte, on Scab in Sheep.	
Mr. Curr, on Fluke.	

PLEURO-PNEUMONIA.

The Chairman stated his views on this disease, and the conclusions he had arrived at, after the most careful inquiry, and submitted for the consideration of the Conference the following Resolutions on the subject. (See Paper No. 5, *infra*.)

The Conference having maturely deliberated on the Resolutions in question, and proposed certain amendments, resolved that Resolutions 1, 2, 3, 5, 7, 8, 9, 10, and 11, as amended, be adopted, and that Resolutions 4 and 6 be expunged.

During the discussion on the above subject—

Mr. Whyte stated that pleuro-pneumonia was not known in Tasmania ;
 Mr. Curr, that it was prevalent to some extent in Victoria ;
 Mr. Gordon, that it prevailed in the North and Central Districts of Queensland ; and
 Mr. Bruce, that it was more or less prevalent throughout New South Wales.

PRINCIPLES FOR INTERCOLONIAL REGULATIONS FOR THE EXTINCTION OF INFECTIOUS OR CONTAGIOUS DISEASES IN STOCK, AND THE CONDUCT OF THE STOCK TRAFFIC BETWEEN THE DIFFERENT COLONIES.

The Conference then proceeded to consider the Resolutions tabled on these subjects (see Paper No. 3, *infra*) ; and, after amending them in several respects, agreed to postpone their final consideration, as well as that of the interpretation of the word "infected," until Mr. Valentine was present.

The Conference adjourned at a quarter past 4 o'clock.

ALEX. BRUCE, *Chairman*.

Office of Chief Inspector of Stock, Sydney, 11th November, 1874.

Present :—

New South Wales :	MR. BRUCE.
Queensland :	MR. GORDON.
South Australia :	MR. VALENTINE.
Tasmania :	MR. WHYTE.
Victoria :	(Absent.)

The Conference having met at ½ past 10 o'clock,—

Mr. Bruce intimated that he had received a communication from Mr. Curr, stating his inability to attend to-day in consequence of indisposition.

The Chairman informed the Conference that the papers ordered to be printed were not quite ready, and suggested that an adjournment should take place until the usual hour of meeting to-morrow, which was unanimously agreed to.

ALEX. BRUCE, *Chairman*.

Sydney, Thursday, 12th November, 1874.

Present :—

New South Wales :	MR. BRUCE.
Queensland :	MR. GORDON.
South Australia :	MR. VALENTINE.
Tasmania :	MR. WHYTE.
Victoria :	MR. CURR.

The Conference having assembled at the usual hour, the minutes of the proceedings on the 10th and 11th instant were read and confirmed.

Mr. Whyte proposed, and Mr. Curr seconded, the following motion :—"That the business already decided by the Conference be re-opened, with the view of allowing Mr. Valentine an opportunity of expressing his opinion."

The Chairman then read the order of business agreed to on the 10th instant, which was affirmed.

The Resolutions relating to pleuro-pneumonia were then read *seriatim*, amended in certain particulars, and agreed to.

During the discussion upon "pleuro-pneumonia," Mr. Valentine stated that the disease only existed in South Australia in isolated cases, and came from travelling stock.

The Conference then resumed consideration of the meaning of the word "infected" in the Resolutions of the Conference.

Mr. Bruce moved that the meaning attached to the said word be as follows :—"Infected" shall be held to apply to any stock which are actually suffering from or affected with any infectious or contagious disease, or which have within the next preceding six months been in direct or indirect contact with stock so suffering or affected, or been dressed or dipped for scab within that period ; and one infected animal in a mob or flock shall be held to render the mob or flock infected.

"Stock" shall mean and include horses, cattle, sheep, pigs, and goats, as usually defined.

Mr. Curr thereupon moved the following amendment :—That the meaning of the terms "infected stock" or "infected animals" (for the purposes of an Act) be any live stock or animals suffering from any disease which at any time shall be declared under such Act or in Regulations thereunder to be infectious or contagious, as also any animal or stock which shall have been lately exposed to a serious risk of contracting any such disease.

After the fullest consideration of the subject, the Conference resolved as follows :—

That "disease" shall mean the diseases specified in the programme of proceedings of the Conference calling for legislative interference, as well as any other disease in stock which the Governor in Council may declare to be an infectious or contagious disease for the purposes of the Act.

That "infected" shall mean and apply to stock actually suffering from or affected with any such infectious or contagious disease, or which have within the next preceding six months been in direct or indirect contact with stock so suffering or affected, or been dressed or dipped for scab within that period ; and that one infected animal in a mob or flock be held to render the mob or flock infected.

That "stock" shall mean horses, cattle, sheep, goats, and pigs, and any animal whatsoever that the Governor in Council may declare to be subject to the provisions of the Act.

The Conference then proceeded to discuss the subject of "Regulations for the importation of Stock from places outside the Australian Colonies," as tabled. (See Paper No. 4, *infra*.)

And the Resolutions having been put *seriatim*,—

No. 1 was agreed to unanimously.

No. 2 having been proposed—

Mr. Curr proposed the following amended Resolution ; viz.—

"That in our opinion the introduction from Great Britain into the Australasian Colonies of sheep, cattle, pigs, and goats should be prohibited as long as infectious and contagious diseases (excepting scab) exist in that country."

Which having been put to the Conference, was negatived upon the following division :—

Aye.
Mr. Curr.

Noes.
Mr. Bruce.
Mr. Gordon.
Mr. Whyte.
Mr. Valentine.

The following amendment was then proposed by Mr. Bruce :—

"That on the expiry of the existing prohibition, it be again renewed and maintained until it be ascertained that there are no cases of foot and mouth disease, or only a few isolated ones, and no rinderpest or sheep-pox, nor any other infectious or contagious disease in stock not known in Australia, existing in Great Britain."

Upon division the amendment was negatived as follows :—

Aye.
Mr. Bruce.

Noes.
Mr. Curr.
Mr. Whyte.
Mr. Gordon.
Mr. Valentine.

A further amendment by Mr. Valentine for the insertion of the words "for twelve months" in lieu of the words "and be maintained," was then proposed and negatived upon the following division :—

Aye.
Mr. Valentine.

Noes.
Mr. Bruce.
Mr. Curr.
Mr. Gordon.
Mr. Whyte.

The original Resolution was then proposed by Mr. Whyte, and carried upon the following division :—

Ayes.
Mr. Whyte.
Mr. Bruce.
Mr. Gordon.
Mr. Valentine.

No.
Mr. Curr.

The sub-clauses were then proposed, and having been amended in a few minor particulars, were adopted.

No. 3 was agreed to.

Mr. Curr handed to the Conference a paper on the subject of Scab in Victoria, which was directed to be printed.

The Conference having reconsidered the "Principles of Intercolonial Regulations for the extinction of Infectious and Contagious Diseases in Stock, and the conduct of the Stock Traffic between the different Colonies," are of opinion that the further consideration of the subject be postponed until the next meeting.

The Conference adjourned at 5 o'clock.

ALEX. BRUCE, *Chairman*.

Sydney, 13th November, 1874.

Present :—

New South Wales : MR. BRUCE.
Queensland : MR. GORDON.
South Australia : MR. VALENTINE.
Tasmania : MR. WHYTE.
Victoria : MR. CURR.

The Conference met according to adjournment yesterday.

SUGGESTIONS FOR REGULATING THE IMPORTATION OF STOCK FROM PLACES OUTSIDE THE AUSTRALIAN COLONIES.

This subject was re-committed, and after amendment in certain particulars, was finally adopted as in Resolutions, No. 3, page 5.

PRINCIPLES FOR INTERCOLONIAL REGULATIONS FOR THE EXTINCTION OF INFECTIOUS AND CONTAGIOUS DISEASES IN STOCK, AND THE CONDUCT OF THE STOCK TRAFFIC BETWEEN THE DIFFERENT COLONIES.

The Conference then resumed consideration of these subjects.

Clauses 1 to 10 having been proposed, were adopted with certain amendments.

Clause 11 was then considered.

Mr. Curr proposed the following Regulation under sub-section 7 of that clause :—

“That sheep proposed to be introduced by land into any Colony undergo a quarantine of fourteen days within the border of such Colony, and during that period be dipped not less than twice, to the satisfaction of an Inspector.”

Mr. Gordon proposed as an amendment that the words “not less than” be inserted before the words “fourteen days,” which was negatived.

Mr. Bruce then proposed, as a further amendment, that the words “thirty days and three dressings” be inserted in lieu of the words “fourteen days and two dressings,” which was negatived upon the following division :—

Aye.	Noes.
Mr. Bruce.	Mr. Curr.
	Mr. Whyte.
	Mr. Valentine.
	Mr. Gordon.

Mr. Curr's motion was then put, and carried on the following division :—

Ayes.	Noes.
Mr. Curr.	Mr. Bruce.
Mr. Whyte.	Mr. Gordon.
Mr. Valentine.	

Mr. Gordon moved the following new Regulation :—

“That sheep introduced by water from a Colony in which scab exists into any other Colony shall undergo a quarantine of thirty days, and be dressed not less than twice to the satisfaction of an Inspector.”

Upon which an amendment was moved by Mr. Whyte, that “fourteen days” be inserted for “thirty days,” which was carried upon the following division :—

Ayes.	Noes.
Mr. Whyte.	Mr. Bruce.
Mr. Curr.	Mr. Gordon.
Mr. Valentine.	

The Chairman at this stage laid before the Conference a communication addressed by the Chief Secretary of Victoria to the Colonial Secretary of New South Wales, with respect to the establishment of a quarantine ground for sheep at Moama, or one of the other crossing-places on the Murray; and the same having been read by the Secretary,—

Mr. Whyte proposed, and Mr. Gordon seconded, the following Resolution, which was unanimously adopted :—

“The Conference is of opinion that it is desirable that quarantine stations for the admission of sheep from Victoria and Tasmania into New South Wales should be established without delay at Moama and Albury, inasmuch as the present restrictions operate most prejudicially to the interests of sheepowners in Riverina, Victoria, and Tasmania, without being at all necessary on sanitary grounds; because the same precautions which are now taken against the introduction of disease at the port of Sydney, may as easily be observed at quarantine stations on the River Murray.”

Mr. Valentine proposed the following Resolution, which was unanimously adopted :—

“That a quarantine station be established at or near Apsley, on the borders of South Australia and Victoria.”

The Conference having again resumed consideration of the proposed Intercolonial Stock Regulations,

Mr. Bruce proposed the following Resolution, to stand as No. 11 :—

“That where there is no infectious or contagious disease in the stock of any two or more Colonies, nor any risk of infection being conveyed, such stock be introduced overland from the one Colony to the other, without being obliged to cross at specified crossing-places or to wait for inspection; and sheep coming by sea from a Colony in which no such disease exists, to undergo a quarantine of fourteen days and two dressings.”

The Resolution was agreed to.

Mr. Bruce then proposed the following new clause, to stand as No. 15 :—

“That where any disease is equally prevalent in the cattle stock of two or more Colonies, those Colonies allow cattle to cross their borders without compelling them to do so at specified crossing-places or to wait for inspection.”

And the same having been put to the Conference, was agreed to upon the following division :—

Ayes.	No.
Mr. Bruce.	Mr. Curr.
Mr. Gordon.	
Mr. Valentine.	

Mr. Whyte did not vote.

Mr. Bruce proposed, and the Conference agreed to, the following clause to stand as No. 14 :—

“That all certificates shall state for how long they are available.”

INSPECTION FEE ON STOCK.

Mr. Bruce proposed the following new Resolution to stand as No. 7 :—

“That no inspection fee be charged by any Colony on the stock introduced from any other Colony.”

Upon which Mr. Curr moved as an amendment :—

“That, in the opinion of this Conference, the motion is one affecting matters which do not come within the scope of the subjects to be dealt with by them.”

The further consideration of the subject was postponed until the next meeting.

The Conference adjourned at half-past 5 o'clock until Monday next, at half-past 10.

ALEX. BRUCE, *Chairman.*

Sydney, 16th November, 1874.

Present :—

<i>New South Wales :</i>	MR. BRUCE.
<i>Queensland :</i>	MR. GORDON.
<i>South Australia :</i>	MR. VALENTINE.
<i>Tasmania :</i>	MR. WHYTE.
<i>Victoria :</i>	MR. CURR.

The Conference having met at half-past 10 o'clock,

The Paper furnished by Mr. Whyte on the nature, causes, and introduction of “Scab in Sheep” was fully considered.

Mr. Valentine stated that South Australia was clean as regards the disease ;

Mr. Gordon stated that Queensland was clean ;

Mr. Bruce stated that New South Wales was clean ;

Mr. Curr stated that about 120,000 were in quarantine in Victoria ; and

Mr. Whyte stated that about 27,000 were in quarantine in Tasmania.

The Conference expressed its opinion that scab was not a disease of spontaneous generation, but was contracted by contagion ; and concurred in the opinions expressed by Mr. Whyte in his valuable paper, as to its nature and treatment.

SCAB IN AUSTRALIA.

With respect to scab now existing in Australia, the Conference unanimously agreed to the following Resolution :—

That,—while acknowledging the magnitude of the undertaking of eradicating scab in Victoria (where the number of infected sheep at one time exceeded 5,000,000), and the innumerable difficulties encountered in carrying out the work, as well as fully appreciating the progress already made in that direction, there being now only about 120,000 sheep in quarantine in that Colony, as well as the fact that nearly the whole of the sheep in Tasmania, amounting to 1,700,000, once infected, have now been reduced to 27,000,—this Conference is of opinion that it is most desirable that all sheep henceforward found scabby, as well as the flocks in which they are found running, should be destroyed as soon as practicable, but in no case later than the 1st January, 1876.

The reasons that induce the Conference to make the above recommendation are as follow :—

- (1.) The existence of scab in any of the Colonies is a source of real danger to the flocks in the other Colonies.
- (2.) It entails very great expense on some of the Colonies, and a considerable amount on them all in the protection of their sheep from infection.
- (3.) It puts a stoppage to free trade in sheep in Australia, and thus causes very heavy losses to all the other Colonies, not only through preventing the trade in store and breeding sheep, but also in the impediments it throws in the way of the introduction of improved stud sheep from one Colony to another.

- (4.) The immense losses that are sustained by all the other Colonies through the existence of scab in Victoria and Tasmania in various ways, even when the disease is not allowed to spread beyond the infected Colonies.

These considerations are altogether irrespective of the incalculable losses sustained by Victoria and Tasmania through the continued existence of scab within their own borders.

CATARRH IN SHEEP.

Mr. Bruce brought before the Conference a paper, which he had prepared and published in the year 1869, on this subject; and the Conference, having duly considered the same, are of opinion that it should be printed and form portion of the series of papers laid before them for consideration.

During the discussion on the subject, Mr. Curr stated that he had been informed upon reliable authority, although he had no personal experience of the matter, that sheep suffering from catarrh camped for several nights upon newly ploughed ground have in some cases recovered.

It was also stated that there had for several years been no outbreak of catarrh in any of the Colonies, and it was believed to have been finally eradicated.

The Conference having maturely deliberated on the subject, resolve that it would be expedient that all sheep infected with catarrh be destroyed.

WORMS IN SHEEP.

Mr. Gordon's paper on this disease was then considered, and the following information as to its extent in the several Colonies afforded:—

Mr. Gordon stated that the disease prevailed in the Coast Country, and the southern portion of the western watershed of the Coast Range of Queensland.

Mr. Valentine stated that the disease was not known in South Australia.

Mr. Whyte stated that the disease was not known in Tasmania.

Mr. Curr stated that the disease prevailed to some extent in Victoria.

Mr. Bruce stated that it prevailed in the upland districts of New South Wales, excepting those of the Murray.

The Conference then considered how the disease spread, and after careful consideration, arrived at the following conclusions as the principal causes:—

1. The deterioration of the pasture through overstocking.
2. The travelling of worm-infested sheep.
3. The absence of salts.

Further consideration and inquiry was, however, considered to be necessary, and the members promised to make due enquiry in the Colonies represented by them.

The Conference then proceeded to discuss the best mode of dealing with the disease, and agreed to recommend the following treatment:—

- 1st.—*Preventive.* 1. Light stocking. 2. Debarring sheep infected from travelling. 3. Liberal supply of salt, i.e., as much as the sheep will take.
- 2nd.—*Curative.* 1. Nitre and sulphur. 2. Sulphur and salt. 3. Decoction of horehound. 4. Oil and turpentine. 5. Areca nut.

The opinions expressed in Mr. Gordon's paper, and the conclusions he had come to, met with their entire concurrence.

FLUKE IN SHEEP.

Mr. Curr's paper upon this subject was then brought before the Conference for consideration, when it was elicited that—

1. The disease prevails very largely in Victoria.
2. Is generally prevalent in the upland districts of New South Wales.
3. Prevails in some portions of the Colony of Tasmania.
4. Exists in South Australia, but is confined to part of the south-eastern district.
5. Exists very little in Queensland, in consequence of sheep having been removed from districts in which it was prevalent.

The Conference quite agree with Mr. Curr in his remarks on the subject, and express their opinion that returns should be obtained and published from time to time, for general information, indicating where fluke, worms, and foot-rot in sheep exist, as a step towards staying the spread of these diseases, and the protection of sound sheep.

The Conference also advise the following preventive and curative treatment:—

1. Salt in abundance, and occasional doses of salt and sulphate of iron; or Mr. Thomas's remedy as set forth in Mr. Curr's paper.

FOOT-ROT IN SHEEP.

Mr. Valentine's paper upon this subject was then considered, when Mr. Curr stated that some cases of the disease existed in Victoria; Mr. Bruce, that it prevails to some extent in the upland districts of New South Wales; Mr. Whyte, that none exists in Tasmania; Mr. Gordon, that it is scarcely known in Queensland; and Mr. Valentine, that it does not exist to any very great extent in South Australia.

The Conference are of opinion that the disease in many instances and in several forms is caused by wet weather and the nature of the soil; and they are further of opinion (by a majority) that malignant foot-rot is decidedly contagious.

Mr. Gordon stated his views upon the subject, and promised to supply the Conference with a short statement of his experience in regard to the contagious nature of the disease, which was directed to be appended to Mr. Valentine's paper.

The Conference then considered the means for its prevention and cure, and recommend the following treatment:—

That the sheep be run through arsenic water at a strength of 2 ozs. to the gallon, dissolved in water or carbolic acid in proportion of 4 ozs. to 15 gallons, both heated to a temperature of 100° Fahrenheit.

Thorough paring and removing hoof where disease exists.

The Conference expressed their concurrence in the views expressed by Mr. Valentine, and the means for treating the disease recommended by him.

Mr. Valentine then proposed and the Conference unanimously adopted the following motion:—

"That this Conference desires to point out that the system of overstocking, so generally carried out over the whole of the Colonies, has had a most injurious effect on the pastures and stock: that it has reduced the size and injured the constitution, and is a great source of disease in stock generally."

The Conference adjourned at 5 o'clock until to-morrow, at half-past 10 A.M.

ALEX. BRUCE, *Chairman.*

Sydney, 17th November, 1874.

Present:—

<i>New South Wales:</i>	MR. BRUCE.
<i>Queensland:</i>	MR. GORDON.
<i>South Australia:</i>	MR. VALENTINE.
<i>Tasmania:</i>	MR. WHYTE.
<i>Victoria:</i>	MR. CURR.

The Conference having met at half-past 10 o'clock, the minutes of the proceedings on the 13th and 16th instant were read and confirmed.

The Conference then resumed consideration of the motion respecting the abolition of an "inspection fee," upon which Mr. Curr had moved an amendment; and Mr. Bruce having obtained permission to amend the motion, proposed the following:—

That it is undesirable that any inspection fee be charged by one Colony on the stock introduced from another, inasmuch as such a charge would tend to prevent the initiation of uniform legislation and combined action by the different Colonies for the eradication of disease.

Mr. Curr proposed the following amendment:—

That the motion before the Conference does not come within the scope of this Conference, and that the levying of inspection fees does not necessarily interfere with uniform legislation on the subject of the suppression of the diseases of animals.

The amendment having been proposed, was negatived upon the following division:—

<i>Aye.</i>	<i>Noes.</i>
Mr. Curr.	Mr. Bruce.
	Mr. Gordon.
	Mr. Whyte.
	Mr. Valentine.

The original motion was then put and carried—Mr. Curr did not vote.

TREATMENT OF FOOT-ROT, WORMS, AND FLUKE.

Mr. Bruce then proposed the following resolution, with respect to the papers laid before the Conference by Mr. Valentine, on the subject of fluke in travelling sheep in South Australia, which was agreed to:—

"That although the Conference expresses no opinion on the action taken in this case, it considers that it is unjust towards those owners whose sheep are free from such diseases as foot-rot, worms, and fluke, and especially to those whose country is not decidedly safe from infection (and they amount to about 30 per cent. of the whole), that sheep infected with any of these ailments should be allowed to travel over such country and infect sound sheep; but that, with the information at present before them, they are not prepared to say how the evil should be met by legislation."

Mr. Bruce also submitted the following motions, which the Conference agreed to:—

DISEASES IN STOCK STATISTICS.

That the several Governments be invited to take power, where they do not now possess it, to obtain returns from owners of the number of their stock and of all diseases affecting them.

EXPERIMENTS.

That the several Governments be invited to follow the example of Queensland, and authorise the expenditure of a sum of money for the purpose of meeting the expense of making experiments for ascertaining the nature, cause, prevention and cure of diseases in stock.

That the Chief Inspectors of the different Colonies regularly transmit the result of these experiments to each other, and otherwise compare experience.

Mr. Bruce then laid before the Conference a paper which he had prepared upon "Inoculation," which the Conference resolved should be appended to, and form portion of, Mr. Bruce's paper upon "Pleuro-pneumonia." (See Paper No. 6, *infra*.)

Mr. Curr proposed, and the Conference unanimously agreed to, the following motion :—

That although the Colonies of New Zealand, Western Australia, and Fiji are separated by long distances from the Colonies represented at this Conference, they should be invited to consider the suggestions and resolutions agreed to at the Conference.

The Conference then went into Committee upon the subjects brought forward for discussion, and after much deliberation agreed to the Report herewith submitted.

Votes of thanks having been accorded to the Chairman and Secretary, the Conference adjourned *sine die*.

ALEX. BRUCE, *Chairman*.

PAPERS SUBMITTED TO THE CONFERENCE; VIZ.—

- 1. Introductory statement by the Chairman, and proposed programme of proceedings.
- 2. Circular letter by the Government of New South Wales to the Governments of the several Australian Colonies.
- 3. Principles of Intercolonial Regulations for the eradication of Diseases in Stock and conduct of Stock Traffic.
- 4. Suggestions for regulating the Importation of Stock from places outside the Australian Colonies.
- 5. Pleuro-pneumonia, by Mr. Alexander Bruce.
- 6. Inoculation for Pleuro-pneumonia, by Mr. Alexander Bruce.
- 7. Scab in Sheep, by the Honorable James Whyte.
- 8. Scab in Sheep in Victoria, by Mr. Edward M. Curr.
- 9. Scab in Sheep in New South Wales, by Mr. Alexander Bruce.
- 10. Scab in Sheep in South Australia, by Mr. C. J. Valentine.
- 11. Catarrh in Sheep, by Mr. Alexander Bruce.
- 12. Worms in Sheep, by Mr. P. R. Gordon.
- 13. Fluke in Sheep, by Mr. Edward M. Curr.
- 14. Foot-rot in Sheep, by Mr. C. J. Valentine.
- 15. Foot-rot in Sheep, by Mr. P. R. Gordon.
- 16. Letter from the Chief Secretary of Victoria to the Colonial Secretary of New South Wales, in regard to Border Quarantine.
- 17. Correspondence with respect to destruction of Sheep for Fluke in South Australia.

No. 1.

INTRODUCTORY STATEMENT by Mr. ALEXANDER BRUCE, *Chairman of the Conference of the Chief Inspectors of Stock of the Australian Colonies, held in Sydney, in November, 1874, and proposed Programme of Proceedings.*

I.—THE REASONS FOR CALLING THE CONFERENCE.

These I will give under two heads or branches.

I.—THE IMPORTANCE OF THE INTEREST INVOLVED.

The importance of the pastoral interest will be best seen by taking the latest available returns of the Horses, Cattle, and Sheep in the five Colonies represented at this meeting, and estimating their value and the Annual Return from them.

STATEMENT of the Number and approximate Estimate of the Value of the Horses, Cattle, and Sheep in New South Wales, Victoria, Queensland, South Australia, and Tasmania, in 1873.

Colony.	Horses.			Cattle.			Sheep.			Total Value of Horses, Cattle, and Sheep in each Colony.
	No.	Average Rate per Head.	Value.	No.	Average Rate per Head.	Value.	No.	Average Rate per Head.	Value.	
New South Wales	328,014	£ 5	1,640,070	2,710,374	£ s. 4 0	10,841,496 0	20,000,000	s. 10	10,000,000 0	£ s. 22,481,566 0
Victoria.....	185,796	12	2,229,552	812,289	4 10	3,655,300 10	10,575,219	10	5,287,609 10	11,172,462 0
Queensland.....	90,000	5	450,000	1,400,000	4 0	5,600,000 0	7,403,334	8	2,961,333 12	9,011,333 12
South Australia...	87,455	8	699,640	174,381	5 0	871,905 0	5,617,419	8	2,246,967 12	3,818,512 12
Tasmania	22,612	12	271,344	106,308	4 10	637,848 0	1,490,746	10	745,373 0	1,654,565 0
	713,877	..	5,290,606	5,203,352	..	21,606,549 10	45,086,718	..	21,241,283 14	48,138,439 4

This makes the total value of the Horse, Cattle, and Sheep Stock of the five Colonies amount to more than £48,000,000,—a very large sum, and, as will be noticed, entirely exclusive of the value of the runs on which the stock are depastured, which of course is also affected to a very considerable extent by the state of the health of the stock.

APPROXIMATE ESTIMATE of the Annual Return from the Horses, Cattle, and Sheep in the Colonies of New South Wales, Victoria, Queensland, South Australia, and Tasmania, taking the Annual "Cast" of Horses at $\frac{1}{8}$ th of the whole number, of Cattle at $\frac{1}{8}$ th, and of Sheep at $\frac{1}{8}$ th; and the average Weight of the Clip in Victoria at 3 lbs. of washed Wool per Sheep, and in New South Wales, Queensland, and South Australia at $2\frac{1}{2}$ lbs. per Sheep. For Tasmania the average actual quantity of Wool exported during the last four years is taken.

Colony.	Horses.			Cattle.			Sheep.			Wool.			Total Value of Annual Return from Stock in each Colony.
	Annual Cast.	Rate per Head.	Value.	Annual Cast.	Rate per Head.	Value.	Annual Cast.	Rate per Sheep.	Value.	Clip.	Rate per lb.	Value.	
N. S. Wales ..	41,011	£ 6	£ 246,066	£ 451,729	£ 5	£ 2,258,645	4,000,000	£ 10	£ 2,000,000	lbs. 50,000,000	s. d. 1 6	£ 3,750,000	£ 8,254,711
Victoria	23,224	12	278,688	135,381	6	812,286	2,115,043	10	1,057,521	31,725,000	1 6	2,379,375	4,527,870
Queensland ..	11,250	6	67,500	233,333	5	1,166,665	1,480,666	10	740,333	18,500,000	1 3	1,156,250	3,130,748
South Australia	10,931	9	98,379	29,063	7	203,441	1,123,483	10	561,741	14,043,547	1 4	936,236	1,799,797
Tasmania	2,826	12	33,912	17,718	10	177,180	298,149	12	178,889	5,000,000	1 6	375,000	764,981
	89,242	..	724,545	867,224	..	4,618,217	9,017,341	..	4,538,484	119,268,547	..	8,596,861	18,478,107

The sum here shown as the annual return from the pastoral properties in the five Colonies, (say) £18,478,107, is a very large one, and proves the great importance of the pastoral interest to the Colonies. There is no doubt however but this amount, large though it be, might be considerably increased if the stock were as far as possible protected from diseases which are preventable; for were I to estimate the loss now sustained in the five Colonies by preventable diseases at only 5 per cent. of the annual return estimated as above at £18,478,107, that would give £923,905,—nearly a million sterling a year. If this be the case,—and there is very little question but that the loss is more than double that amount,—a determined and simultaneous effort ought surely to be made by all the Colonies to eradicate these diseases as far as circumstances will allow; and where that course cannot be entirely carried out with regard to some diseases, the endeavour should be made to circumscribe their scope and effect as much as possible.

Losses by Disease.

Approximate estimate of the Losses sustained by the Australian Colonies up to this date through preventable diseases in Stock:—

By Pleuro-pneumonia in Cattle	£8,000,000
By Scab in Sheep	20,000,000
By Catarrh	2,000,000
	£30,000,000

This is exclusive of the losses from Foot-rot, Fluke, and Worms, which are also to a certain extent at least infectious or contagious and preventable, and which must amount to a good many millions sterling.

While the correctness of the estimate here given of the losses through disease cannot be fully established, it cannot, I am sure, on the other hand, be shown to be far from the truth.

At any rate, the amount set down as loss by Pleuro-pneumonia is within the mark, for it is now allowed on all hands that the first attack of that disease carried off from 30 to 40 per cent. of all the stock in New South Wales, and there have in some instances been two, three, and even four attacks since the first.

As to Scab, the losses from that disease have from first to last in this Colony been very great. In Victoria, some twenty years ago, it was estimated that there were 5,000,000 of infected sheep, and the losses in that Colony alone through the existence of the disease must be over 10 millions sterling. In Tasmania again, four years ago, almost all the sheep were infected, and had been for a great many years; while in South Australia and even in Queensland very severe losses have been sustained through this disease.

The losses from Catarrh,—which is now it is hoped finally eradicated,—were very heavy in this Colony, and also in Queensland and Victoria.

2.—CIRCUMSTANCES OF THE COLONIES.

1. The circumstances of the Colonies, as regards the keeping and moving of live stock, are such as to make the establishment and maintenance of a perfect quarantine impracticable, so far as regards cattle, and

to render it a matter of certainty that if an infectious or contagious disease obtain a footing among that description of stock in any of the Colonies it will soon spread to them all. The circumstances here alluded to are the following :—

- (1.) The extensive and constant intercolonial traffic in cattle, by which, if an infectious or contagious disease exist in any of the Colonies, it is certain to be spread to all the others—passing, as cattle frequently do, over a thousand miles of country, and through perhaps two or three different Colonies.
- (2.) The constant passing of bullock teams all over the Colonies and from one Colony to another, after, it may be, travelling through and camping on infected runs and mixing with infected stock.
- (3.) The straying of stock from one run to another, and from one Colony to another, and thus where they are infected carrying disease with them, in spite of any number of boundary riders.

As, therefore, the maintenance of a perfect quarantine is impracticable, it is useless for one Colony to attempt to protect itself against the introduction of any infectious disease which may appear in the cattle stock of any of the neighbouring Colonies, by issuing a proclamation against the introduction of cattle from the infected Colony.

2. Even where a quarantine can be maintained such as in the case of sheep, the want of similar and simultaneous action by all the Colonies has been a source of constant inconvenience and expense, and has led to the loss of millions of money to stockowners in the different Colonies, in the following ways :—

- (1.) By the issuing of prohibitions against the introduction of stock, and thus stopping the trade in stock which would otherwise exist.
- (2.) By the enforcement of regulations calling for the inspection and quarantine of stock on their introduction from other Colonies, thereby entailing inconvenience, expense, and loss of time.

II.—OBJECTS OF CONFERENCE.

1. To deliberate on subjects relating to the prevention of diseases in stock which are of Intercolonial importance.
2. With that view, to propose and discuss motions relating to such subjects.
3. To submit resolutions for the consideration of the Governments of the different Colonies.

III.—PROGRAMME OF PROCEEDINGS.

With the sole view of expediting the business of the meeting, and without the least desire to forestall the decision of the Conference in regard to the selection of questions for discussion, I beg leave to submit the following list of subjects for your consideration :—

1.—DISEASES CALLING FOR LEGISLATION.

1. What Diseases in Stock call for legislative interference, and which of them have obtained a footing in the Colonies and which not.

Diseases already in Australia.

1. Pleuro-pneumonia.
2. Scab in sheep.
3. Catarrh.

Diseases not yet in Australia.

4. Rinderpest.
5. Foot and mouth disease.
6. Small-pox in sheep.
7. Glanders in horses.

2.—DISEASES CALLING FOR CONSIDERATION.

1. Worms.
2. Fluke.
3. Foot-rot.
4. Cumberland disease.

3.—ORDER OF BUSINESS.

I would also, with the same view, propose that these subjects be discussed in the following order :—

1. Pleuro-pneumonia.
2. Importations from places beyond the Colonies.
3. Scab in sheep.
4. Worms in sheep.
5. Foot-rot.
6. Fluke.
7. Catarrh.
8. Cumberland disease in cattle and sheep.

4.—POINTS RELATING TO DISEASES TO BE DISCUSSED.

With respect to each of the diseases already in the Colonies, the following points might perhaps be discussed :—

- (a.) Nature.
- (b.) Cause.
- (c.) How it was introduced.
- (d.) To what extent it prevails.
- (e.) How it has spread.
- (f.) How it is to be dealt with.
- (g.) And, generally, any other questions relating to diseases in the colonial stock (whether infectious or not), and their prevention.

With respect to the diseases not now in Australia, the following questions will have to be discussed :—

- (a.) Which of these diseases are liable to be introduced ?
- (b.) From what parts of the world is their introduction to be guarded against ?
- (c.) Effect of their introduction ?
- (d.) How is their introduction to be prevented ?

5.—GENERAL SUBJECTS.

1. The framing of Intercolonial Regulations for the extinction of infectious and contagious diseases in stock, and the conduct of the stock traffic between the different Colonies.
2. The collection and publication of statistics with respect to disease, under the authority of the law in each Colony.
3. The carrying out, reporting, and comparing experiments for ascertaining the nature, cause, and cure of diseases in stock.

No. 2.

CIRCULAR LETTER by the Government of New South Wales to the Governments of the several Australian Colonies.

THE COLONIAL SECRETARY, NEW SOUTH WALES, TO THE CHIEF SECRETARY, VICTORIA.

*New South Wales,
Colonial Secretary's Office,
Sydney, 14 July, 1874.*

SIR,

I HAVE the honor to transmit to you, herewith, a copy of the printed Report of the Chief Inspector of Stock for this Colony on the Infectious and Contagious Diseases in Stock prevailing in Europe, which affect or are likely to affect Australian live stock ; and to request that the attention of your Government may be invited to the 6th and concluding section of that Report, in which it is suggested that, with the view of securing joint and simultaneous legislative action on the part of all the Australian Colonies in dealing with those diseases, the Chief Inspectors of all the Colonies concerned (each accompanied by a veterinary surgeon) should be invited to meet in Sydney to consider the question and report to their respective Governments on the subject.

2. The Governments of South Australia, Tasmania, and Queensland have been communicated with on the subject ; and I have the honor to request that your Government may be invited to consider Mr. Bruce's suggestion, and that I may be apprised as early as convenient whether your Colony is prepared to assist in giving effect to his proposal.

3. It is proposed that the projected meeting of Chief Inspectors, &c. should be fixed for Monday, the 31st of August next.

I have, &c.,
HENRY PARKES.

No. 3.

PRINCIPLES for Intercolonial Regulations for the extinction of Infectious or Contagious Diseases in Stock, and the conduct of the Stock Traffic between the different Colonies, as submitted to the Conference.

I.—INFORMATION TO NEIGHBOURING COLONIES.

1. That each Colony communicate by telegraph full and distinct information as to the position, extent, and nature of every outbreak of infectious or contagious disease in stock as quickly as possible to the Chief Inspectors of the other Colonies.

2. That the Inspectors in the border districts be instructed to send immediate information by telegram to the nearest Inspectors of the neighbouring Colonies of every outbreak of such disease which occurs within fifty miles of the border.

3. That the track by which the disease was introduced, and the history of the outbreak, as well as the possibility of its extension, are to be carefully examined into, and the Inspectors for the districts into which this track leads in the neighbouring Colonies are to be always put in possession of these particulars with the least possible delay.

4. That every Colony in which any such disease exists shall publish quarterly in the Government Gazette a report upon the state of the disease, what prohibitory measures have been issued, their alterations or rescindment.

5. That this report be sent direct to the Chief Inspectors of the different Colonies.

II.—MEASURES FOR THE ERADICATION OF DISEASE.

6. In these suggestions the term "infected" is held to apply to any stock which are actually suffering from or affected with any infectious or contagious disease, or which have within the next preceding six months been in direct or indirect contact with stock so suffering or affected, or been dressed or dipped for scab within that period; and one infected animal in a mob or flock is held to render the mob or flock infected.

The term "stock" shall mean and include horses, cattle, sheep, pigs, and goats, as usually defined.

7. That each Colony forthwith initiate such measures as shall effect the speedy extinction of all infectious or contagious diseases in stock which are controllable by quarantine, and shall take such measures with respect to all these diseases not so controllable as shall prevent their spread and tend to their gradual extinction.

8. That in order to remove every inducement to the owners of infected stock to conceal the fact of their being so, all animals killed and goods destroyed by order of the Government, for the purpose of suppressing disease, to be paid for by the Government, at a rate equal to their value at the time they are destroyed; and the expenses incurred in destroying such stock or goods be borne equally by the Government and the owners.

9. That all conveyances which have served for the transport of live stock, and all fittings and articles which have been used by or with such stock, and from which there is any risk whatever of infection spreading, shall be disinfected before being again utilised; as well as all conveyances, fittings, and articles which have served or been used in the transport of manure, fodder, litter, or other matters which have their origin or been in contact with animals suspected of disease.

III.—CONDUCT OF INTERCOLONIAL STOCK TRADE.

10. That where an outbreak of disease occurs in any Colony, the neighbouring Colonies may, pending the extent and risk of the outbreak being definitely ascertained, at once issue a prohibition against the introduction of stock from such Colony, and the duration of such prohibition shall depend upon the amount of risk arising from such outbreak.

11. That if it be clearly shown that the outbreak is only an isolated one, or only of a limited extent, and confined to only one or two districts, and that the measures for isolation and extinction are there carried out according to the same principles and with the same stringency as in neighbouring Colonies,—in that case the export of stock from the remaining non-infected portions of the first-mentioned Colony, situated at a safe distance from any spot in such Colony where infection exists, may be allowed to the neighbouring Colonies under the following conditions, namely:—

1. *As regards all stock,—*

(1.) That they are admitted at appointed places only.

(2.) That the drover shall supply a written statement giving the following particulars:—
(a.) Whether or not the stock have within the next preceding six months been in direct or indirect contact with infected stock. (b.) The place from which they started. (c.) The nearest centre to such place of any infectious or contagious disease in stock of the same description as those presented for inspection. (d.) The nature and extent of such disease. (e.) The route by which such stock travelled to the place on the border where they are inspected. (f.) The nearest centre of infectious or contagious disease as aforesaid to any portion of such route.

(3.) That they are inspected at such place previous to crossing or landing, and be found to be apparently sound.

2. *As regards sheep.*

(4.) That when introduced overland they be branded with a letter, to indicate the Colony from which they are to be introduced—say N for New South Wales, Q for Queensland, A for South Australia, and V for Victoria.

(5.) That they in every case be accompanied by a certificate of their freedom from disease, and of their not having been in direct or indirect contact with infected sheep during the next preceding six months: and that they have not been dressed for disease for six months previously.

- (6.) That where they are conveyed by train, the trucks in which they are carried shall have been thoroughly cleansed and disinfected previous to the sheep being put into them; and when introduced by sea, that the portion of the vessel where they are to be penned was cleansed and disinfected in the same way.
 - (7.) That they undergo a quarantine of a sufficient duration at the port of debarkation, or on the border, and be properly dressed with some thoroughly effectual dressing, to the satisfaction of the Chief Inspector.
 - (8.) That they do not leave the quarantine until the Inspector in charge shall certify that they are free from disease.
12. That the individual Colonies shall communicate to one another by whom and in what manner these certificates have been drawn up, and for how long they are available.
13. That the trade in thoroughly dry skins, bones, horns, hoofs, melted tallow in casks or skins, cow-hair, and goats'-hair, in so far as these latter objects are packed in sacks or bales, as well as straw, hay, and other substances, between a non-infected and an infected Colony, is exempt from the operation of these Regulations.
14. That a Colony be not bound to compensate for any stock which may be attacked by disease and have to be killed, if such stock have not been the preceding sixty days at least within such Colony, unless it can be proved that the infection took place in the Colony itself.
15. That the suggestions be recommended for the adoption of and be held to be binding upon the Governments of the Colonies represented at this Conference; and where the law in any of these Colonies does not place the Government in a position to carry out these suggestions, it is further recommended that in such cases the Government take the very earliest opportunity of obtaining the necessary Parliamentary sanction.
16. That the Colonies of Western Australia and New Zealand be invited to adopt these suggestions.

No. 4.

SUGGESTIONS for regulating the Importation of Stock from Places outside the Australian Colonies, as submitted to the Conference.

1. That the existing prohibition against the introduction of all stock, except horses, from places outside the Australian Colonies, be allowed to stand.
 2. That on its expiry it be again renewed, and maintained until it is ascertained that no foot and mouth disease, rinderpest or sheep-pox, nor any other infectious or contagious disease in stock not known in Australia exists in Great Britain, when importations from these Countries might be allowed under the conditions hereinafter mentioned.
 - (1.) That the introduction of all stock except horses shall be absolutely prohibited from all other Countries, and also from all Colonies except those agreeing to these Regulations.
 - (2.) That, with the view of placing the Governments of the several Colonies in a position to carry out these proposals, their Agents-General be instructed to obtain from the Secretary of Her Majesty's Veterinary Department, London, prior to the departure of each mail for the Colonies, a report as to what infectious and contagious diseases then exist among the live stock of the United Kingdom, and to what extent they are each known to prevail.
 - (3.) That the Agents-General transmit this report by each mail, and when necessary by telegram, to the respective Governments.
 - (4.) That when importations from the United Kingdom are renewed, all pedigree stock intended to be introduced from thence into Australia be examined at the port of shipment by a duly qualified veterinary surgeon, appointed conjointly by the Agents-General for the General Colonies, who shall make a satisfactory declaration that to the best of his knowledge and belief such stock are free from any infectious or contagious disease.
 - (5.) That the live stock (if any) for the use of the passengers put on board the same ship as the stock intended to be introduced into the Colonies, be also examined by the same veterinary surgeon, and certified in like manner to be also free from infection.
 - (6.) That every ship from places beyond the Australian Colonies, on arrival there, be boarded by an Inspector, and all stock intended to be landed from such ship, previous to being so, be examined by a duly qualified veterinary surgeon, or medical man.
 - (7.) That if such stock, or any stock whatever on board such ship, be found to be infected with any infectious or contagious disease not already introduced into any of the Colonies, all such stock be forthwith destroyed.
 - (8.) That if apparently free from disease not known in the Colonies, the stock intended to be landed be disinfected on board ship, and conveyed to a thoroughly isolated quarantine, to be there properly disinfected and to undergo a probationary detention, at the owner's expense, of *fifty* days at least.
 3. That the Colonies of New Zealand and Western Australia be invited to adopt these Regulations.
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PLEURO-PNEUMONIA.

PAPER prepared by Mr. ALEXANDER BRUCE, Chief Inspector of Stock, New South Wales.

(Laid before the Conference of Chief Inspectors of Stock, held in Sydney in November, 1874.)

1.—NATURE.

Pleuro-pneumonia in cattle has its seat in the first instance in the blood, being febrile in its earliest stages, but becoming typhoid in its second and third or last stages, with a specific termination in disease of the lungs and pleuræ, the changes in which (in the shape of inflammatory exudation) hold the same relation to the true disease that the eruption in small-pox does to the blood state in that disease.

The best authorities are in favour of not regarding this as a local disease originating in and confined to the lungs and pleuræ. It is, therefore, properly speaking a misnomer to call it pleuro-pneumonia, for it may never reach the second or third stages and affect the lungs, but exhaust itself in the first or febrile stage; and it is upon this fact that the efficacy of inoculation is based.

2.—CAUSE.

It has now been settled beyond all question that the cause of pleuro-pneumonia is infection or contagion conveyed either directly or indirectly from the diseased animal to the sound.

In proof of this I might quote the opinions given by six authorities of the highest standing in Great Britain, in reply to a question put to them by the Directors of the Scottish Chamber of Agriculture, in September, 1868. The gentlemen I refer to were—

James B. Simmonds, Royal Veterinary College, London;
Professor Williams, Principal of the Veterinary College, Edinburgh;
Professor M'Call, Principal of the Veterinary College, Glasgow;
Professor Hugh Fergusson, H.M.V.S., Veterinary Department, Ireland;
John Edwards, Esq., Abergele, North Wales; and
Finlay Dunn, Esq.

The question was—"Is the disease contagious, or how does it continue to exist?" and their answers were as follows:—

Simmonds—Infectious.
Williams—Decidedly contagious.
M'Call—Do.
Edwards—Very contagious.
Fergusson—Decidedly infectious and contagious.
Dunn—Distinctly contagious.

I may also add that every intelligent unprejudiced stockowner in the Colonies has arrived at the same conclusions from his own personal observations.

3.—INTRODUCTION AND SPREAD OF PLEURO-PNEUMONIA IN AUSTRALIA, AND THE LOSSES CAUSED BY IT.

Pleuro-pneumonia was introduced by a cow brought from England by Mr. Boadle, of the Plenty District in Victoria, and landed in Melbourne in 1858.

When the disease was first discovered among Boadle's cattle, steps were promptly taken to eradicate it. All the cattle on the farm were paid for by private subscription and destroyed, and the farm placed in quarantine; but through a greedy, ignorant neighbour putting some of his cattle into one of the infected paddocks, the measures adopted were rendered nugatory, and the disease spread throughout Victoria and to all the other Colonies. On its doing so, attempts were made one after another to stamp it out; but for the reasons which I have stated in my opening paper—the impossibility of establishing a perfect quarantine—these efforts all proved worse than useless, and the disease is now more or less prevalent in them all, and likely to be so without fresh legislation; for travelling stock are so frequently affected, that no sooner has a fresh race of animals grown up which have neither had the disease nor been inoculated, than they are infected by cattle travelling through their runs.

The losses caused by the disease during the thirteen years it has prevailed (it did not spread to any great extent till 1860) cannot be estimated at less than 40 per cent. of the whole number of cattle (say 5,000,000)—that is about 1,750,000 head, which at (say) £4 10s. a head, makes the total loss to the Colonies, through this disease, amount to nearly £8,000,000.

That this is a very moderate statement of the losses sustained throughout the Colonies will, I think, be allowed when it is recollected that the losses sustained by dealers and butchers on the roads are not included in the above percentage—that some herds have, during the period referred to, been attacked two, three, and even four times—and that while there are now three times as many sheep in this Colony as there were in 1862, there were, up to last year, actually fewer cattle in the Colony than in 1862.

4.—INOCULATION IN AUSTRALIA AND THE RESULT.

Upon the failure of these attempts to stamp out pleuro-pneumonia, which was caused, as has been explained, through the impossibility of maintaining a perfect quarantine, stockowners began to look round for some other means of combating the disease. They saw at once that their cattle were too wild, and of comparatively too little value to be doctored; they therefore turned to inoculation, which was recommended by Mr. Cleote, of Zandoliet, Cape Colony, in a letter published in the Sydney and Melbourne papers of December, 1861; and the first to make the attempt was Mr. Thomas Mitchell, Little River, Victoria. Shortly afterwards the Messrs. M'Laurin, of Yarra Yarra, New South Wales, and other owners in their neighbourhood, also tried inoculation with decided success. These experiments, which were fully reported by me and published from time to time by the Government of New South Wales, speedily induced other stockowners, in all the Colonies, to try the operation; and inoculation, as a preventive for pleuro-pneumonia, is now generally practised in all the Colonies with decided success. I am quite within the mark when I say that up to this time a million and a half of cattle have been inoculated in Australia.

Notwithstanding that the first attempts at inoculation were made under the most unfavourable circumstances, a very large majority of the stockowners in all the Colonies from the first expressed themselves strongly in favour of the operation, and that majority has since gone on steadily increasing. Thus, when the opinion of the stockowners in New South Wales was asked in 1867, it was found that only in six districts out of thirty-four were they reported by the Inspectors as "*not in favour of inoculation*," and in only one of these six districts did the owners express themselves decidedly against it.

In April, 1869, again, 1200 copies of a circular, containing a series of questions with respect to inoculation and its efficacy, were distributed by the Inspectors of Sheep among owners possessed of more than 200 head of cattle.

To those questions 501 replies were received, of which 279 were from owners who inoculated their herds, and 222 from those who did not do so. In the case of the former, the greater part of these replies convey the required information, but in many of the latter they are both meagre and incomplete.

Tabulated lists of these returns by owners were prepared by me, giving the substance of the more important replies; and from these lists again two abstracts were made up, which showed, with respect to owners *who inoculated* their herds, that there were 25 neither for nor against inoculation, 237 in favour of it, and 17 against it; or *about 14 for, to 1 against, inoculation*. Of the returns by owners *who did not inoculate*, there were 75 neither for nor against inoculation, 102 in favour of it, and 45 against it; or *about 7 for, to 3 against, inoculation*. While taking *both classes* of returns together, there were in all 100 neither for nor against inoculation, 339 in favour of it, and 62 against it; or, *upon the whole returns, about 5½ for, to 1 against, inoculation*.

The foregoing figures exhibit a very strong case in favour of inoculation—indeed they establish its efficacy; but although they do so, it may not, perhaps, be out of place to call attention to an additional fact, elicited by this inquiry, which is strongly confirmatory of that result; it is,—that while the returns by the owners who inoculated show on the one hand that the disease, according to the size of the herd and the extent of the infection when inoculated, disappeared in the course of a *few weeks*, or at most of a few months, after the cattle were inoculated, those by the owners who did not do so show that, in many cases, the disease existed in their herds for *several years*. *In no case can it be gathered that the disease lasted over six months in a herd which had been properly inoculated*. On the other hand, again, it will be seen that the disease has in the uninoculated herds existed in 3 herds for 6 years, in 9 herds for 5 years, in 6 for 3 years, in 2 for more than 2 years, in 13 for 2 years, in 6 for 18 months, in 2 for 15 months, in 2 for 14 months, in 1 for 13 months, in 2 for more than 12 months, and in 11 for 12 months; *while it still exists in 18 of these herds, and has done so for periods of from 2 to 6 years*.

Since that inquiry was made, the practice of inoculation has become still more general in proportion to the extent of the prevalence of the disease,—the number of cattle affected being of course fewer than at first,—while the results have been far more satisfactory, the owners having gained more experience in the mode of inoculating. This is borne out by the returns annually received by me since that time, from the District Inspectors; but I need only trouble you with those for 1872 and 1873.

In 1872 the Inspectors in *twenty-two* districts report the owners as in favour of inoculation; in one district as against it, and in *one*, divided, while in *ten* districts no returns were received from owners on this subject. In 1873 again, the Inspectors in *twenty-six* districts report the owners in favour of that treatment, and in *three* districts as divided, while in *five* districts owners failed to return answers in regard to inoculation.

Stockowners found their belief in the efficacy of inoculation on the following grounds:—

1. That in almost every instance where inoculation is properly tried, the disease shortly disappeared from the herd, in a shorter or longer period, according to the size of the herd, but always before *three months* from the date of inoculation.
2. That while the disease thus disappears in a short time from the herds which are properly inoculated, it continues in those which are not inoculated for periods of from *two to six years*, according to the size of the herd.
3. That cattle which have been properly inoculated when sound, with a few solitary exceptions, never afterwards become diseased, although they may frequently mix and sometimes even be put into the same paddock as inoculated cattle which are dying of the disease.

4. That where the right sort of virus is used and the operation properly performed, and the weather not too hot, the deaths from inoculation never exceed more than *two* and seldom more than *one* per cent.

There have certainly been frequent instances of the failure of inoculation, but these could always be traced to one or other of the following causes:—

1. *To the cattle being badly diseased when operated upon.*—In most cases the owner did not inoculate until he was thoroughly alarmed, and he did not become so until he lost perhaps 15 or 20 per cent. of his cattle by the disease. The consequence was, that when he did inoculate *three-fourths* at least of his herd were diseased, although they perhaps did not appear to be so; and the operation would require to be a cure, as well as a preventive, to be thoroughly or even moderately efficacious under such circumstances.

2. *To the use of improper virus.*—The directions first received for selecting the right sort of lung and virus were very vague and meagre, and a great deal of virus which was worse than useless, in fact actually deleterious, was used by those who were most anxious to perform the operation correctly. Not only was a great deal of virus which was thoroughly unfit used in those ways by owners and others who were most anxious to perform the operation correctly, but many pretended professional inoculators, who knew little or nothing as to how the operation ought to be performed, and who did not care what sort of stuff they used, so long as they made, as they often did, from £5 to £10 a day, went about from station to station inoculating, and it was quite impossible that in their case the operation could be attended with success.

3. *To a wrong mode of operating.*—The first instructions on this head also were very defective, or rather erroneous. Even after better information had been obtained, and considerable experience acquired in taking the virus and inoculating, the operation was frequently badly performed through carelessness and haste.

4. *To the great heat of the weather when the cattle were inoculated.*—At certain seasons of the year the weather in Australia is by far too hot for an operation of this description when performed on quiet cattle, and it can easily be seen how very much worse it would be, and how many more cases there would be of mal-inoculation in such weather, with comparatively wild "bush" cattle, which are always heated and excited when driven into the yard, and almost maddened by the operation in the inoculating pen.

5.—INOCULATION IN ENGLAND.

Until the last few years, Professor Gamgee, late Principal of the New Veterinary College, London, was the only authority of standing in England who upheld inoculation for pleuro-pneumonia, and he is still a consistent supporter of that treatment.

I only met with two other veterinary surgeons in England who were so—Mr. Duguid of "The Browns" Institution, Wandsworth Road, and Mr. Priestman, Caledonian Road, London. Mr. Priestman had inoculated about a thousand cows with uniform success.

Although not an advocate for the practice, Professor Brown, Chief Inspector for Her Majesty's Veterinary Department, London, is a believer to a certain extent in its efficacy. He admitted to me, in December last, that the belief in it was gaining ground in England, and that the best course which could be adopted in Australia with infected cattle was to inoculate them.

Inoculation is also practised by the dairymen in the suburbs of London; and in the end of last year an inquiry was carried out, at the suggestion of Professor Gamgee, by Mr. Morgan Evans, among the dairies in those localities, when he found that of thirty-two dairymen who had inoculated their cattle there were thirty decidedly in favour of the practice.

INOCULATION ON THE CONTINENT OF EUROPE.

So far back as 1863 a resolution was passed by the First International Veterinary Congress of veterinary surgeons from all parts of Europe,—held at Hamburg, in July of that year at the suggestion of Professor Gamgee of London—"That all cattle suspected of being infected with pleuro-pneumonia should be inoculated;" and that while not a single voice was raised against the efficacy of inoculation, some of the members of the Congress—which included such men as Professors Gerlach and Hertwig of Berlin, Roll of Vienna, Nicholas of Munich, Haubner of Dresden, Hering of Stuttgart, and Gamgee of London—went so far as to propose that a law should be passed making the operation compulsory in all such cases.

I also found from personal inquiry, in November and December last, that the efficacy of inoculation was fully established in Belgium, Holland, Germany, Austria, France, and Italy. The heads of the veterinary departments in these Countries one and all expressed themselves decidedly in favour of inoculation, and, on learning from my letter to the "Veterinarian" the manner in which our cattle are kept and managed, strongly recommended its practice in Australia; in fact, they went so far as to say that no veterinary authority of any note on the Continent now disputed the efficacy of inoculation.

I further learned from Professor Muller, of Berlin, that the practice in Germany is,—when an outbreak occurs in such places as the beetroot sugar factories, where large numbers of cattle are fattened off on the refuse of the beet, and where there are, of course, frequent changes of stock,—to kill the diseased animal and inoculate the others. This practice is also generally followed in the case of outbreaks of pleuro-pneumonia in the large dairies where fresh cows are being constantly introduced.

RESOLUTIONS SUGGESTED.

From what has been said it will be gathered that the efficacy of inoculation for this disease is now thoroughly established on the Continent of Europe. I think I may safely say that it has long been so in Australia and also in South Africa, and it has latterly been practised with decided success in the United States of America. As, therefore, cattle affected with pleuro-pneumonia are still frequently kept and travelled, not only by those owners who are prejudiced against the practice of inoculation, but also by many who believe in its efficacy, but who defer inoculating until they send their fat cattle to market, or in other ways suit their own convenience,—I would suggest that a law should be passed in all the Colonies in which pleuro-pneumonia exists; containing some such provisions as the following :—

- (1.) That every mob of cattle which has become legally infected, *i.e.*—in which there is any one or more animals which have been in direct or indirect contact with infected cattle,—be inoculated when the virus can be obtained in the mob or in any cattle within sixty miles of the place where the mob was found to be infected.
- (2.) That owners give notice of every outbreak of the disease to their neighbours, to Inspectors, and to the public.
- (3.) That none but properly qualified and licensed inoculators be allowed to inoculate for others.
- (4.) That all inoculated cattle be branded as such with a brand to be fixed upon.
- (5.) That properly inoculated cattle depasturing on a run, on the expiry of *six weeks* from the last case of disease, be allowed to leave the run and to pass over infected ground without being deemed infected.
- (6.) That cattle which become infected and are not inoculated should not be allowed to leave their run for *three months* after the last case of disease, nor to travel over infected ground.
- (7.) That all individual travelling cattle showing that they are actually affected with or suffering from pleuro-pneumonia be killed immediately they are found to be so.
- (8.) That if the travelling cattle in which any animal is thus found to be actually affected be fat stock, they be taken by day to their destination by the roads least likely to spread the disease, and timely notice be given by their drovers to all owners of horned stock on or near the road that the mob is infected.
- (9.) That where the travelling cattle in which any animal is thus found to be actually affected with pleuro-pneumonia are store stock, they be forthwith stopped and inoculated, and afterwards taken to their destination, as provided for in the next preceding regulation; but such cattle be not required to travel more than six miles a day for the first thirty days after being inoculated.
- (10.) That the owner of travelling cattle give notice of his intention to cross or pass along runs where stock of the same description are kept, if the road be not separated from the run by a sufficient fence.
- (11.) That the drover do not abandon any travelling stock, nor leave the carcasses of any stock which may die undestroyed, under a penalty not exceeding £1 when the stock are not infected and £50 when they are.

The conclusions then at which I arrive in regard to pleuro-pneumonia and its proper treatment in these Colonies are the following :—

1. That as in all other parts of the world, so in Australia, every attempt to cure this disease has proved utterly futile.
2. That the endeavours which were made in the Colonies to stamp it out by destroying the infected herds were complete failures, through the impossibility of maintaining a perfect quarantine.
3. That inoculation for pleuro-pneumonia is now very generally practised, and has proved a thorough preventive against the disease.
4. That under these circumstances the only course left for us is, either—
 - 1st. To let matters stand as they are, and allow those owners who are either too selfish or too prejudiced to inoculate their infected cattle, to travel them, as they are now doing, from one end of Australia to the other, leaving the dead and dying, and spreading the infection in all directions, whereby the Colonies suffer a loss of something like half a million a year; or,
 - 2nd. We must pass some such measure in all the Colonies as that here indicated, making the inoculation of infected cattle compulsory, and otherwise regulating the cattle traffic.

Reduced to these two alternatives the decision must be easily arrived at; for it is simply barbarous that the law should continue to allow mobs of diseased cattle to be driven through, it may be, scores of runs on which the stock are free from infection, and infect them; and the only course left is for all the Colonies to pass some such measure as that here suggested. It is to be hoped that they will adopt this course; and if they do, there is every reason to believe that the losses from pleuro-pneumonia will be speedily reduced to a tithe of what they now are, and that the disease will eventually be eradicated.

While there is no doubt as to the efficacy of inoculation for pleuro-pneumonia, it is very essential that the best mode of carrying out that treatment, both as regards the sort of virus to be used and the manner of operating, should be ascertained; and I would suggest that the different modes of inoculating

as practised by the owners in the several Colonies should, wherever the operation is at all properly carried out be strictly watched by the Inspectors of Stock, and that full and careful reports on each case should be regularly transmitted to their Chief Inspector, who would arrange the information thus obtained, and compare it with that collected in a similar way in the other Colonies.

ALEXANDER BRUCE.

No. 6.

INOCULATION FOR PLEURO-PNEUMONIA.

PAPER prepared by Mr. ALEXANDER BRUCE, Chief Inspector of Stock, New South Wales.

MODES OF OPERATING.

THE operation has been performed in many different ways. At first a portion of the diseased lung was tied to or inserted under the skin of the tail ; but this mode was soon found to be altogether erroneous, and was discarded.

At present cattle are usually inoculated on the outside of the tail, about 1 to 1½ inch from the tip, in one or other of the four following ways, namely—

1. With a lancet or knife dipped into the virus.
2. With a grooved inoculating knife.
3. With a needle like an elongated spaying one, about 5 inches long, and a thread saturated with virus.
4. With a needle fastened in a handle like a bradawl, with an eye in the point, by means of which short threads saturated with virus are inserted in the tail.

Of the four modes, I would give the preference to No. 3, as experience has proved that bad swellings are less likely to arise from the use of the needle and thread than the knife or lancet ; and it is impossible to exercise the same care and exactness with the handled needle as with the other.

REMEDY FOR EXCESSIVE SWELLINGS.

The best mode of guarding against losses from excessive swellings is to examine the animals operated upon carefully once, or, if possible, twice a day, from the 4th to the 30th day after they have been inoculated ; and if there is the slightest puffing or swelling at the root of the tail or in the hind-quarters, to cut well into it with a good sized pocket-knife, however small and soft it may be, and insert in the wound a small pledget of tow saturated with Venice turpentine and butyr of antimony, black oil, or blistering ointment. When the gathering has been allowed to become at all indurated, a hot iron raised to a white heat might be tried in an incision made right through the gathering.

VIRUS USED.

Up to a comparatively recent period, the virus used for inoculating has been (1) that taken from the lung in the second stage of the disease ; and (2) that found in the cavity of the chest near the lung, which has just exuded from it. Lately, however, some owners have been inoculating with (3) the water found in the chest in cases where hydro-thorax has set in, and others have been using (4) preserved virus, prepared by adding to Nos. 1 or 2 glycerine in the proportion of 1 to 1.

There is no doubt as to the efficacy of sorts 1 and 2 ; but there is often considerable difficulty in selecting the animal that will, when slaughtered, yield the right sort of these descriptions of virus ; and if No. 3 prove thoroughly effective, there is no doubt but it will be generally used in preference to Nos. 1 or 2, for it is much more easily found ; and, as it is a great deal weaker, fewer dangerous swellings will follow its use. If this is the case, the question also arises whether or not the virus from the lung or its surroundings, *i. e.* sorts 1 and 2 is not too powerful, and has caused the dangerous swellings which have not unfrequently occurred even in cases when the inoculation was carefully performed. If this again be answered in the affirmative, a very great advantage indeed will be gained ; for not only will virus, as we have seen, be more readily and plentifully obtained and used with less risk, but it will be possible by adding an equal quantity of glycerine to sorts 1 and 2 to preserve the virus for any length of time, and thus have a thoroughly effective virus when required. It is to be hoped that this will be the case, as it would put us in a very much better position for eradicating the disease by inoculation ; and every possible endeavour should be made to settle the question by inducing owners to try the water in the chest and report the result.

No. 7.

SCAB IN SHEEP.

PAPER prepared by the Honorable JAMES WHYTE, Chief Inspector of Stock, Tasmania.

(Laid before the Conference of Chief Inspectors of Stock, held in Sydney in November, 1874.)

HAVING, at the request of Mr. Bruce, undertaken to write a paper on the subject of "Scab in Sheep," embracing at the same time some account of what has been done in Tasmania to eradicate the disease there, I find, on sitting down to redeem my promise, that I am placed in a much greater difficulty than might be supposed, considering I have had considerable experience in connection with the subject.

On various occasions during the last six years, through the Press and otherwise, I have written a good deal on this question, by way of advice and instruction, addressed to the sheepowners of Tasmania ; but it has been done in a disconnected and desultory manner, from time to time, to suit circumstances as they arose, and to meet the fanciful objections of those who held to the belief in *spontaneous generation* and the impossibility of completely eradicating scab in a country with the physical conditions of Tasmania. Such articles, therefore, even if I had them with me to refer to, would not be of much service for the present purpose.

Moreover, so much has been written by others, and written so well, during the last ten years, on the subject of this disease and its cure, that there is really nothing new to be said regarding it which can be expected to prove of much practical value to the sheepowner. I will not, therefore, attempt to travel out of the path so clearly indicated in Mr. Alexander Bruce's Treatise on "Scab in Sheep and its Cure," published in 1864, and "An Essay on Scab in Sheep, its causes, symptoms, pathology, best means of treatment, and practical hints for its avoidance and extermination, &c.," by Mr. Edward M. Curr, published in 1864 or 1865. In short—I believe it would be sufficient for the present Conference of Inspectors in dealing with "Scab and its Cure" simply to recommend the re-publication and sale of the pamphlets referred to at a cheap rate, in order to secure to the least informed sheepowner in Australia all the knowledge he requires to enable him to deal speedily and successfully with scabby sheep, if he should be unfortunate enough to become the possessor of such very undesirable property.

At a meeting of this kind composed of practical men, called together for the purpose of devising and recommending to the several Australian Governments the adoption of Regulations for the eradication and prevention of diseases in cattle, horses, and sheep, &c., in a paper on the "Scab Disease" it may be interesting to those I am addressing, and possibly useful to others, if I give a brief sketch of my experience in connection with the working of the Scab Act and the history of previous legislation on the question in Tasmania.

The first effort to free the flocks of Tasmania from scab was made during the government of Sir W. Denison, nearly thirty years ago ; when a Scab Act was passed which, like some of the first Scab Acts of New South Wales, failed to accomplish the object of its framer, and remained a dead letter on the Statute Book. It did not provide any machinery for carrying out the law ; and, so far as I know, it was never acted upon in a single instance.

The question was often discussed amongst a few of the settlers who had visited the neighbouring Colonies and had observed the superior condition of the flocks there, and the greater advantages derived from clean sheep as compared with the condition of their own flocks, and the smaller amount of profit arising from them ; but nothing further in the way of legislation was attempted until 1863, when I caused a Bill to be introduced to Parliament which proposed to repeal the obsolete Act of Sir William Denison's time and provide a more practical method of dealing with the subject. When the second reading of this Bill came on, I found so many of my country supporters were opposed to a Scab Act of any kind that it became a political necessity to withdraw the measure. The result was that the matter was shelved for a further period of five years.

In the meantime the necessity for legislation had become more generally felt amongst sheepowners in the principal sheep districts ; and at their instance, I believe, the late Mr. George Gibson, then a Member of the House of Assembly, and a warm advocate for a stringent Scab Act, introduced and carried a Bill through that Chamber in 1868. When this Bill came on for consideration in the Legislative Council, I observed that it was somewhat crude in its nature, and, like its obsolete predecessor, failed to provide the machinery to carry it out. It was therefore evident to me that it would share the same fate as the Act it proposed to repeal. At a meeting of gentlemen deeply interested in the subject, when I pointed out wherein the Bill was, in my opinion, defective, I was asked if I could frame a better one. My reply was, "Yes, I think so, if I have time." It was then agreed that the Bill then before the Council should be allowed to pass, postponing the time for its coming into force until after the next Session of Parliament ; and I thereupon undertook to prepare a more practical and comprehensive measure to bring forward in 1869.

During the recess I prepared "The Scab Act, 1870," and after meeting a violent opposition in the House of Assembly, arising from a variety of causes it is unnecessary to specify here, the Bill was passed, although in a crippled form, both as to penal provisions and the means for carrying them out.

I felt satisfied, however, that defective and crippled as the measure was, it yet contained sufficient powers for good to prove something more than the "thin end of the wedge," and would demonstrate to the sheepowners, as a body, that it was quite practicable to clean sheep in Tasmania as easily, if not more easily, than in the neighbouring colonies.

One of the difficulties I had to contend with in framing the Bill was to provide for a state of things which did not exist in any of the neighbouring Colonies, where infected and diseased sheep were exceptional, the majority of the flocks being clean when the various Scab Acts then existing were passed. The whole of the Tasmanian flocks being infected, with a very few exceptions, it was necessary so to frame the Act that its operation would not all at once harshly or oppressively interfere with commercial transactions, while at the same time it would check to a large extent the dissemination of infection by the travelling of diseased sheep, and provide compulsory measures for eradicating the disease as rapidly as possible under the circumstances. Another difficulty, and the greatest one of all, was that a very large proportion of the sheepowners were unbelievers in the possibility of effectually curing sheep at all ; inasmuch as they thought the disease was one which sheep were always subject to more or less ; and that the terms *clean* and *scabby* were comparative terms dependent upon the amount of scab which might exist in one flock as compared

with another; and also dependent upon the amount of care bestowed upon them by their owners in the way of dressing. Another considerable section believed that sheep were clean elsewhere; but they believed at the same time that the nature of the country in Tasmania was such that it was hopeless to expect the sheep could be collected so closely as to ensure a perfect and effectual dipping, and therefore anything beyond a mere compulsory dipping Act would be useless and vexatious to boot. The number of sheep-owners who thoroughly believed that it was as practicable to cure sheep of scab in Tasmania as elsewhere, and who were earnestly determined to support me in carrying out any measure to that end, no matter how stringent it might be in its provisions, was so small that I believe I could name them on a page of foolscap paper without any difficulty, even if I were to add the names of their residences and the districts in which they reside. Fortunately for the interests of the Country, a considerable number of the latter class had seats in both Houses of Parliament, and their influence effectually defeated the efforts of those who opposed the Bill.

The section of sheepowners favourable to the Bill, although desirous of having a stringent Act, agreed with me that for a period which we fixed at eighteen months the Act should be very mild, not only in its provisions but also in its administration; that it should be, in fact, merely a compulsory dipping Act for that period, combined with the prevention of visibly diseased sheep travelling on the public highways; and when this *probationary period* had expired, then the more stringent clauses of the Act should come into operation. The mode in which this view was carried out will be explained as I proceed.

While preparing the measure, naturally I had occasion to have much correspondence with sheep-owners throughout the island, conveying to them on my part reasons deduced from my own personal experience, in the Colony of Victoria, with scabby sheep in the first place, from 1838 up to 1841-2 and 3, and afterwards with the same sheep, clean up to 1854. Doubtless, the fact of my having prepared the Bill, and having in the course of a violent opposition to it shown that I was practically acquainted with the subject, induced a desire amongst some leading settlers that I should undertake the administration of the Act as Chief Inspector. Consequently, the Government proposed to me that I should carry out my own measure. Having committed myself to very confident statements regarding the absolute certainty of success, fully believing in the certainty of results if it should be prudently carried out, and fearing its failure and almost certain repeal within eighteen months if committed to the care of an inexperienced or injudicious administrator, I undertook to carry out the law.

It must be borne in mind that in 1869 the whole of the Tasmanian flocks were infected and diseased, more or less, with the exception of a few—certainly not embracing a larger number than between 20,000 and 30,000 sheep, chiefly in the Midland and Northern Districts.

The leading features of the Act were—compulsory dipping twice immediately after shearing, at an interval of not less than ten nor more than fourteen days, in some reputed scab-destroying preparation, and the prevention of *visibly diseased* sheep from travelling on the highways or being exposed for sale in public sale yards. The last-mentioned provision was only to remain in force for eighteen months, but was, at my instance, subsequently extended by Parliament to twenty-six months, giving, at the same time, power to the Governor in Council, on the recommendation of the Chief Inspector, to extend the time for any further period not beyond the 1st day of March, 1873. On my recommendation, this period, *which may be termed the probationary period of the Act*, was extended only to the 1st November, 1872.

Up to this date licences to cleanse were issued without any fee. On the 1st November, 1872, all sheep still infected had their licences renewed for six months on payment of one farthing per head; and on the 1st of May, 1873, all infected sheep were liable to a licence fee of 3*d.* per head, the Chief Inspector having the power to issue the licence for any period not exceeding six months. As a rule they were and are issued for three months only.

The "Scab Act, 1870," was passed during the Session of 1869, and it was intended by me that it should come into operation on the 1st of January, 1870; but, unfortunately, through some misconception of the probable results which might arise if a later date should be fixed upon, an amendment proposed by an enemy of the Bill was carried, which postponed the date when the Act should become law until the 1st of March, 1870.

As the general shearing season terminates early in January, the postponement of the Act taking effect until the 1st of March acted generally as a postponement of the operation of the compulsory dipping provisions for twelve months, or until after the termination of the shearing season of 1870-71. But although this was the general result of the change in the date of the Act becoming law from the 1st January, 1870, to the 1st of March of the same year, there were many sheepowners who acted upon the impression that dipping was compulsory immediately after the shearing of 1869-70, and in many cases with such satisfactory results that some gentlemen who had very strongly and earnestly opposed the introduction of a Scab Act, in the firm belief that it would be so detrimental to the interests of sheepowners that possibly, nay probably, it would involve the ruin of themselves and that of hundreds of others of the same class,—on finding how beneficial their compliance with the dipping provisions of the Scab Act had proved, wrote and otherwise informed me of the fact; and ever after that time heartily lent me the weight of their influence upon public opinion, and the benefit of their advice in enabling me to frame the Scab Act Amendment Act, No. 2, which became law on the 21st December, 1871.

Since then the Act has been amended and added to on three several occasions to meet defects which its working had disclosed, and to have re-inserted the same or similar provisions to those which had been struck out of the first Bill in its progress through Parliament in 1869.

One of the leading features of the Act as it stands now provides that any person found in possession of infected sheep is liable to a penalty of not more than £50, and a licence fee of 3*d.* per head for any period the Chief Inspector may fix, not exceeding six months. An Inspector in any case of this kind may take possession of the sheep and report the same to the Chief Inspector, who may direct such steps to be taken for the purpose of cleansing the said sheep as he may think fit; and if the owner refuses to comply with the directions of the Chief Inspector in any such case, the Act empowers him to destroy the sheep:

Several cases have arisen where it has become necessary to take possession of sheep and have them dipped under efficient direction; but in no case have I found it necessary to destroy a flock, and I believe no such case will ever arise.

When any portion of country has been declared a "clean sheep district," no sheep of any kind can enter therein without a written permit from an Inspector. In other respects the law is much the same as in the neighbouring Colonies with reference to registration of brands, returns, &c., &c.

The owner of infected sheep, in addition to the licence fee of 3*d.* per head, is also, in the event of a mixture with clean sheep through defective fences or otherwise, liable for the cost of dipping the flock so infected, and damage to the amount of not more than £50. This has been felt to be an absurdly low amount in several cases, but nevertheless up to the present time the full amount has never been exacted.

The penalties generally are much smaller than in any of the other Australian Acts, and as a rule there was a strong disinclination on the part of country Benches to inflict a maximum penalty. This feeling, however, has become very much modified of late—so much so indeed that I shall be in no way surprised, when the several Acts come to be consolidated next Session of Parliament, if I am requested to propose an increase of 50 per cent. at least to some of these penalties. I have no doubt whatever that the disinclination to inflict anything like sufficient penalties during the years 1871 and 1872 considerably retarded the cleansing process. This I took occasion to point out from time to time, but I am sorry to say without much avail.

The progress of the work accomplished by the Scab Act in Tasmania may be shortly stated as follows:—

All the sheep in the island, excepting between 20,000 and 30,000, were infected and diseased, more or less, when the Act was passed on the 22nd of October, 1869, to come into operation on the 1st of March, 1870.

On the 1st of May, 1871, 126,916 sheep were under clean certificates, but double that number were believed to be in a condition to claim it.

In the month of December, 1872, in compliance with an order of the House of Assembly, I furnished a rough progress return of the number of sheep on the 1st of that month in the several sheep districts, as being under clean certificates, clean certificates applied for, and other sheep supposed to be clean at that date, as follows:—

Sheep under clean certificates	688,064
Sheep certificates applied for	120,000
Sheep supposed to be clean, but for which the owners had not applied for clean certificates, or for which strictly they would not be legally entitled to certificates of clean- ness	100,000
Estimated number clean on 1st of December, 1872	<u>908,064</u>

On the 1st of May 1873, the following return was furnished to Parliament:—

Sheep under clean certificate	1,002,104
90 per cent. of 243,514 sheep for which clean certificates have been applied for	219,162
80 per cent. of 82,992 sheep for which no applications for clean certificates have been made in accordance with the Act	66,398
Estimated number clean on 1st May, 1873	1,287,659
Number under licence on 1st May, and other sheep con- sidered doubtful	84,398
	<u>1,372,057</u>

The last return laid before Parliament was made up to the 1st of June, 1874. The summary of that return gives the total number of sheep in the island on the 1st of January last, and their condition on the 1st of June, as follows:—

Number of sheep clean	1,503,846
Number under licence	27,396
Total	<u>1,531,242</u>

The report has the following remarks on the above returns:—

The appended return shows that only 27,396 sheep are known to be infected. I may observe, however, that all these sheep have been carefully dipped, and I believe that many of the lots are now clean. Certainly 50 per cent. of the 27,396 sheep are only nominally infected. A considerable number of these have been dipped as a precaution, and having come in contact with infected sheep, are consequently under licence; but notwithstanding this they may be considered virtually clean, although they cannot be moved as clean sheep under the Act until the expiration of their licence, and a clean certificate obtained from the Inspector.

At this date, the 1st of November, I may safely state that the number of sheep actually infected is under 10,000, and I feel assured that it is not an unreasonable thing to believe that in another year the island of Tasmania and the islands in the Straits will be wholly freed from scab disease.

The complete eradication would have been accomplished, I believe, in 1873, but for the postponement of the Act coming in force having postponed compulsory dipping until the shearing season of 1871-72, and the inadequate provision made in the first place for an efficient inspecting staff. Until November, 1870, I could only afford to have two sub-inspectors, then three more were appointed, and in the following year an additional one, for itinerating purposes, and to assist the others on occasions of emergency. In 1873, and for the current year, the assessment was increased from one farthing to one half-penny per sheep, which will barely suffice to maintain the existing staff during 1875, when the assessment will again be reduced to the original amount, viz., one farthing per head, unless Parliament may think it requisite to continue the half-penny per head another year. At present I am not prepared to say whether or not it will be necessary. Had the assessment been one half-penny per head from the first, as I proposed it should be, and which would have passed but for the violent feeling against a Scab Act of any kind whatever, which was entertained by a very considerable section of the House of Assembly in 1869, I have no hesitation in again repeating my firm conviction that in 1873 the disease would have been eradicated. It was a wretched piece of parsimony, miscalled, or rather alleged to be economy; whereas, in truth, the real design lurking in the minds of its advocates was an anxious desire and intention to destroy the Bill.

When I began to prepare material to frame the Bill in 1869, I made in the first place a calculation of the loss fairly attributable to the existence of scab, and embodied it in a letter addressed to sheepowners, through the Press. This calculation showed an annual loss of £120,749, arising from the following causes, viz.:—Loss in quantity of wool, loss in value of wool, cost of dressing, cost of profitless labour, and loss on stud and fat sheep.

Another calculation was made at the same time, at my request, without any knowledge of each other's opinions on the several points, by Mr. Robert Clerk, of Malahide, who had had many years experience in Victoria as a sheepowner in the Western District, and his estimate was £145,676 per annum. At the time I had no doubt of Mr. Clerk's estimate being more accurate than mine with regard to the total amount, but I preferred adhering to my own as the smaller and safer calculation to base arguments upon.

In 1872, after the Scab Act had accomplished much that had been predicted, I revised my calculation of 1869, and arrived at the conclusion that when the Scab disease should be wholly eradicated, the increased income of sheepowners would amount to £153,000 per annum, as follows:—

Revised Estimate of probable annual Gain to be derived from the complete eradication of Scab.

1. Increased quantity of wool, say 562,500 lbs., or 6 ozs. per sheep,	£
at 1s. 4d. per lb.	37,500
2. Increased value of present quantity, taking 5,000,000 lbs. as an average, at 3d. per lb.	62,083
3. Cost of dressing annually for tobacco, drugs, and additional labour in dressing under the old system of spotting every few weeks ..	13,500
4. Saving of the labour of 500 men at £50 each.	25,000
5. Increased number and value of fat sheep, say ..	10,000
6. Increased export of rams and ewes to the neighbouring Colonies, say ..	5000
Total.	<u>£153,000</u>

Now I am satisfied that the above amount was fully realised in 1873, and will certainly not fall short of it in 1874 and future years.

The first item I have ascertained by reference to the books of settlers, who were good managers under the old system with scabby sheep, is 8 ozs. instead of 6 ozs. increased weight of fleece, with hot water washed wool got up in the best style. With regard to the increase of weight on badly managed flocks, in many instances I believe from $\frac{3}{4}$ to 1 lb. per sheep is not an exaggerated quantity. Taking the numbers of sheep for a series of years, from 1863 to 1869 inclusive, with the average quantity of wool produced, and comparing them with the years 1870 to 1873 inclusive, an increase of nearly 10 ozs. per sheep is clearly demonstrated as the result of the Scab Act.

The calculations of 1869 and 1872 were laughed at by many settlers at the time, and pronounced to be absurd exaggerations; but now many of these unbelievers who thought them the delusions of mere theoretical dreamers, admit that their own experience has proved to them that the scouted calculations were not the dreams of enthusiasm, but the sober and careful conclusions of practical men, based upon data derived from the results of their own former experience in the early years of the settlement of the Colony of Victoria.

All the items in the calculations, excepting the 4th, are under the mark, the two last more particularly. For instance, in 1873 the value of stud sheep exported to the neighbouring Colonies was nearly, if not quite, £20,000. It is true the Scab Act did not make these sheep, but it preserved if it did not create the market for them.

In a letter which I addressed to sheepowners in 1869 or 1870, when I was endeavouring to arouse them to a sense of the enormous loss the Colony had sustained through the presence and almost universal prevalence of scab, I made a statement that during the last forty years a sum of not less than £3,500,000 had been lost from that cause alone. The statement to many minds appeared to be a rash one; but now, after a fuller, and I believe more intelligent and matured consideration of the subject, I feel justified in stating my conviction that if another £1,000,000 had been added it would have been an understated amount instead of an exaggeration.

Ten years ago Mr. Curr, the Chief Inspector of Victoria, stated that that Colony was then losing half a million per annum on, I think, about 5,000,000 of infected sheep, and I have no reason to believe it was other than a moderate estimate. What amount all the Colonies collectively, directly and indirectly, have lost from scab it would be difficult to estimate with any degree of accuracy; but certainly it cannot fall much short of £20,000,000 sterling since 1835,—a sum nearly equal to the cost of construction of all the railways now open in Australia.

CAUSE OF SCAB.

Notwithstanding all that has been written on this subject, we are still utterly in the dark as to the origin of a disease which we have reason to believe existed in Italy in the early days of the Roman Empire. And I think it is of small importance to us what was its origin, when we know from the experience of half a century in New South Wales and over thirty years in Victoria that in the climatic conditions which exist in this part of the world, scabby sheep once freed from the disease never contract it again, unless from contact with diseased or infected animals, or from contact with places where such animals have recently been.

This subject has been so well handled by Mr. Edward M. Curr that I think I cannot do better than give a quotation from his "Essay on Scab." After referring to various authorities on the subject, he dismisses the theory of spontaneous generation with the following observations:—

But however undecidedly Youatt, Gamgee, and others may have expressed themselves on this head, it is stated by some sheepowners in Victoria, roundly enough, that scab is occasionally the result of spontaneous generation, and that they know instances of it. As far as my experience of sheep has gone in this and the neighbouring Colonies during five-and-twenty years, I must acknowledge I have never been able to hear of scab having appeared in flocks under circumstances which could not be accounted for without having recourse to the hypothesis of spontaneous generation. But on this subject the very loosest ideas obtain; and to such of my readers as interest themselves in the matter, I would recommend the perusal of Carl Theodor von Siebold's remarks in his opening chapter on tape and cystic worms, in which he makes some very pertinent reflections on the whole subject of equivocal generation.

To finish with this subject then. It is clear that the scab could not originally and in the first instance have been the result of contact; but that it must either have been created with the sheep, or have resulted from some other principle or process of nature. My ideas lead me to the latter belief, and to the probability of this disease being eventually traced to some other form of living thing, as has already happened in the cases of other parasites. Be this as it may, it will remove all reasonable fears of the frequent occurrence of spontaneous generation of scab by calling to mind that this question may be considered to have been set at rest for all practical purposes by the well-known and undeniable results of sheep-farming in New South Wales. There, upon large tracts of country, subject to many varieties of climate, feed, and other circumstances, millions of sheep have been depastured for forty years, without the occurrence of scab in any one instance until it was imported from this Colony. New Zealand and Queensland verify the same fact. Hence we may conclude that the spontaneous generation of scab, if possible, can only, at all events, be of the rarest occurrence, and that its consideration may be safely left to the man of science, postponing the discussion of "*How does spontaneous generation take place?*" until it be proved that spontaneous generation has actually occurred.

SYMPTOMS AND BEST MODE OF CURE WITH SULPHUR AND TOBACCO.

The symptoms of the disease, and the best mode of cure with a mixture of tobacco and sulphur, have been so fully dealt with in the pamphlets of Messrs. Alexander Bruce and Edward M. Curr, referred to at the commencement of this paper, that I think it would be a mere waste of time, if not a piece of presumption on my part, to attempt to add anything by way of improvement to what they have written. I therefore recommend any person desirous of getting valuable information with reference to the symptoms of the disease and its cure to purchase one or both of the pamphlets referred to.

I may observe, however, that the mode of mixing sulphur and tobacco, recommended by Messrs. Bruce and Curr, does not contemplate the sulphur being dissolved—the tobacco is in fact the cure, and the sulphur is to preserve the sheep from re-infection.

Doubtless if the tobacco is good, and the mixture properly applied, it is a very effective and certain cure; but it is possible for the tobacco to be bad, particularly if home-grown "knock-me-down," cut perhaps at an improper time.

My experience in Tasmania during the last three years leads me to prefer a mixture of sulphur and lime as being the most certain cure, without any risk of the article being bad in quality.

The following correspondence discloses how the subject came under my notice in June, 1870, and how I brought it before the sheepowners afterwards:—

TO THE EDITOR OF THE MERCURY.

SIR,

As the season of the year is rapidly approaching when sheepowners will be called upon to dip their sheep in accordance with the provisions of "The Scab Act, 1870," it appears to me to be very desirable that publicity ought to be given to any

interesting information bearing upon a question not only of importance to the owners of sheep, but of vast importance to the public at large, from its bearing upon the value of the export of wool from Tasmania, and the supply of wholesome food to its inhabitants.

Notwithstanding all that has been said and written on the subject, and the varied experience of sheepowners not only here but in every Colony in Australia and New Zealand, there is still a great diversity of opinion amongst sheepowners here as to the best and cheapest mode of effecting a cure. There are many known certain remedies, but some of them are highly objectionable on account of the danger to the constitution of the sheep: such as arsenic and corrosive sublimate, both of which are certain remedies if properly applied, but so liable to accidents, and so troublesome to those using them, that I would strongly advise their being abandoned as a dressing for sheep in any shape or form whatever. And as we cannot be certain that some of the "specifics" that have of late years been used in this Colony and elsewhere are not to some extent composed of these objectionable and dangerous drugs, it seems to me unwise to use them when simpler, cheaper, and more certain curative mixtures can readily be procured.

In seeking to clean his sheep the settler ought to satisfy himself that the dress he uses is a certain remedy if properly applied. This is the most important consideration no doubt; but if two mixtures are equally certain as a cure, the next important consideration is, which is the safest for the sheep, as well as the cheapest for the sheepowner.

I have invariably recommended a mixture of sulphur and tobacco, as the cure is certain and it cannot injure the sheep; but from recent observation of the effect of sulphur and lime, as recommended by Dr. Rowe, of Victoria, I am inclined to think that its use as a dipping mixture is well worthy the consideration of sheepowners, before the arrival of the shearing season.

These remarks have been induced by the result of an experiment with sulphur and lime by Mr. Barnard, a settler on the banks of the Tamar, who called upon me in June last to inspect two sheep very much diseased which had got into his flock.

I visited Mr. Barnard's farm on the 10th of June, and after examining the sheep referred to, authorised him to destroy them. In the whole course of my experience I never saw sheep in a worse condition with scab than one of them exhibited. After some conversation with Mr. Barnard, who appeared to take a lively interest in the question generally, and what was considered the best mode of cure, it struck me that, instead of destroying the two scabby sheep, they would be excellent material to experimentalize upon, and on naming this to Mr. Barnard, he readily adopted the idea, and promised to dip them in the mixture of sulphur and lime, the efficiency of which we had been talking about.

The result of the experiment I received in a letter from Mr. Barnard to-day, a copy of which is appended.

The quantity of sulphur per gallon used by Mr. Barnard is only half the quantity recommended by Dr. Rowe; and although in the present case two ounces of sulphur per gallon appear to have been sufficient, I should prefer the larger quantity, as the article is so cheap.

I am, &c.,

JAMES WHYTE.

August 15, 1870.

SIR,

In compliance with your request I dipped the two sheep that you examined on the 10th June in a preparation of sulphur and lime, and I have now the honor to inform you of the manner in which I treated them, and with what results.

On the evening of your inspection I dipped them for the first time, using 2 ozs. of sulphur and 2 ozs. of slack lime to the gallon, at a temperature of 120 degrees, allowing the sheep to soak for rather more than a minute. On the 20th of June—ten days—they were dipped again in a mixture of the same strength and at the same temperature. You will remember that one of the sheep was a mass of hard scab across the shoulders and a large part of the back, and there were also many large lumps containing matter, the remainder of the sheep was covered with hard spots of scab; the other sheep was not quite so much diseased. Of course the hard parts were well scarified before dipping. They have been kept apart from other sheep, and now a period of fifty-four days having elapsed since they were last dipped, I believe them to be, after careful examination, perfectly clean. The late inclement weather would surely have caused them to break out afresh if the scab were not completely killed.

I remain, &c.,

THOS. BARNARD.

JAMES WHYTE, Esq.

TO THE EDITOR OF THE MERCURY.

SIR,

At the present time when the shearing season is about to commence, and the compulsory dipping provisions of the Scab Act come into operation, any information bearing upon the question of what is an effective, and at the same time a cheap, dipping mixture is of much interest to a large number of your country subscribers. I would, therefore, recommend you to republish the following letters from Dr. John P. Rowe and Mr. John Sanderson, bearing upon the curative properties of a mixture of sulphur and lime.

I have known Dr. Rowe for more than twenty years as a large sheepowner who has had a most extensive experience with both clean and scabby sheep; and from my knowledge of his personal character, I have perfect faith in the truthfulness of his relations as to the results of his own experiments with sulphur and lime.

The cheapness of this mixture is a great recommendation; and the evidence we have of its effects from Dr. Rowe in Victoria, and from those who in several instances used it in Tasmania last season, leaves no doubt whatever on my mind that as a cure for scab, if properly applied, it is a certain one.

There is a diversity of opinion as to its effect upon the wool, if used when the staple has a few months' growth, but this is not of much importance as regards dipping immediately after shearing. To settle the disputed point as to the alleged injury a mixture of sulphur and lime inflicts upon the wool, by depriving it of one of the properties a manufacturer prizes so highly, viz., softness, it would be very desirable if some of our sheepowners would try an experiment with a sufficient number of sheep from a flock, and send the wool home with the bulk of the clip to be examined and tested by the most competent judges in the London market, who could compare the wool from the sheep which had been dipped in lime and sulphur when the wool had attained a considerable, or even a full growth, with wool from the remainder of the flock which had not been subjected to the same application, but had been dipped in some other mixture, say tobacco and sulphur or carbolic acid.

Both of the last-mentioned mixtures are no doubt certain scab-destroying agents, but they are both also more expensive than sulphur and lime. The duty having been removed from carbolic acid will materially reduce its cost, but even then it will prove more expensive than sulphur and lime. There are two advantages, I am told, which carbolic acid possesses over the other mixtures referred to; the first is, that it in no way injures the wool; and secondly, that it may be applied cold with equally certain results as if applied in a heated state. If this be true, and I shall certainly look upon it with doubt until I have fuller evidence of its being a fact, it would give to carbolic the first place amongst scab-destroying preparations, even although its first cost might exceed either of the other curative mixtures I have referred to, inasmuch as the saving of trouble and labour in pre-

paring the heated mixtures would more than counterbalance the extra cost of the article which could be used cold. I am only referring, however, to what I have heard, and not to what I have seen. I should certainly not think of using the cold carbolic acid mixture, excepting by way of experiment.

To the class of smaller sheepowners, if there be a mixture that can be used effectively in a cold state, it would doubtless be of very considerable importance, but to the larger class of sheepowners it appears to me a matter of very small consequence the additional labour and expense of heating the dipping mixture, as compared with the saving which would arise from being enabled to use it in a cold state.

The consideration of every sheepowner at the present time, in my opinion, ought to be not so much which is the cheapest mixture to dip their sheep in, but which is the most certain in its effects, and at the same time not injurious to the constitution of the sheep.

Specifics of all kinds should be looked upon with the greatest suspicion, and be carefully avoided. The makers and vendors of such medicines are in many instances trading upon the ignorance and credulity of their customers. They pretend to be possessed of some superior knowledge. They offer to the settler, in fact, valuable results in a mysterious way, and keep him in ignorance of possible contingencies which may result from the use of their nostrums, the danger of which can be avoided by using simple compounds, the results of which are well known, and are, moreover, more certain than any specifics we have yet seen, and which cannot possibly injure the animals operated upon.

I would strongly advise sheepowners not to use arsenic or corrosive sublimate in any form whatever. They are dangerous applications, although certain cures, if properly applied. With the greatest care heavy losses have often resulted from their use, arising from atmospheric or other causes, which have never been as yet satisfactorily ascertained. Then why use such objectionable drugs when there are so many simple mixtures to choose from, equal, if not superior, as curative applications, and perfectly harmless to the sheep?

I append the letters referred to, which were published in the *Australasian* of the 22nd instant.

Your obedient Servant,

Hobart Town, 29th October, 1870.

JAMES WHYTE.

LIME AND SULPHUR CURE FOR SCAB IN SHEEP.

TO THE EDITOR OF THE MANSFIELD INDEPENDENT.

SIR,

THE solution of sulphur and lime (hydro-sulphuret of lime) is now pretty well known and acknowledged to be the cheapest and most reliable cure yet discovered for scab in sheep. It is quite equal in efficiency to the old and very unscientific mixture of tobacco and sulphur; is much cheaper and more reliable. The quality of tobacco cannot always be depended upon; sulphur is always genuine. At this period of the year, after our sheep are shorn, all diseases of the skin to which they are liable are more easily cured, and there is less risk of deteriorating the value of the wool by soiling, which all dippings, even in simple hot water are apt to do when the staple has advanced in growth to any extent. It cannot therefore be too extensively known that even one dipping in the above solution is sufficient to cure the most inveterate case of scab in sheep (even when its pelt has assumed the rhinoceros character) without in the slightest degree injuring the health of the animal or the fibre of its wool; and to assist sheepowners in endeavouring to banish at once and for ever the bane of the wool-growing interest, I am induced to ask you to publish again the recipe for its preparation and use.

Take of flour of sulphur 100 lbs., 50 lbs of quick-lime (a large proportion of it partially slacked). Put these together in a boiler with 100 galls. of water, keep mixed by constantly stirring for about ten minutes, or until a clear dark brown orange-coloured solution supervenes. Then mix 1 gallon of this solution with 3 gallons of hot water, and make your dip or bath heated to from 100 deg. to 114 deg. Fahrenheit, and plunge your sheep over head in it, keep them swimming in it for about one minute; when they are dry the cure is complete; but to prevent risk of re-infection, and to secure a more perfect muster, a second dip after about ten days, in a bath one-half the above strength, will render assurance doubly sure. A compulsory simultaneous dipping of all the sheep in Victoria during next January would save the country thousands of pounds, and render Scab Inspectors and Boards of Advice quite unnecessary. As the most valuable testimony of the effects of this cure on the wool of dipped sheep, I send you a letter I have received from Mr. Sanderson, the eminent wool merchant of Melbourne. It will also be found interesting just now to persons about to wash their sheep in the hot water soak. Mr. Sanderson, I believe, dipped his sheep in lime and sulphur when the fleece was about half grown, and if he is now enabled to get up his wool, as he says, "in colour perfect," nothing more can be desired. I regret this gentleman has not given us the contents of his soak, as we would then know the quantity of soap requisite; but perhaps he will supply this omission.

Your obedient Servant,

Mount Battery, 12th October.

JOHN P. ROWE.

Brie Brie, Glen Thompson, 8th October, 1870.

MY DEAR DR. ROWE,

I HAVE purposely delayed, until now, writing to you the result of dipping my sheep with your mixture of lime and sulphur, so that I could speak with certainty as to its effect on the wool when washed. I have now been waiting about a week, and I think I cannot give you a better report upon the wool than by sending you a sample of it, from which you will see that the colour is perfect, and that the dip does not leave the slightest stain. We are, however, obliged to use more soap than when the sheep were undipped. This is to be expected from the presence of sulphur requiring a strong soak to remove it. I began washing with the same quantity of soap as was used last year, and at first could not imagine what was wrong with the sheep, they were so dingy after leaving the spouts. We are using soft soap, which my manager thought was the cause; we then tried hard soap with the same result, but found that as we increased the quantity of soap in the soak the whiter the sheep left the spouts. Last season we used 12 lbs. of soap to the soak, now we use 24 lbs., and the wool was as well washed as I could wish. I was not on the station when the sheep were dipped, but my manager reports as follows:—"I used it in the following proportions:—(I should mention we were dipping for ticks):—100 lbs. sulphur and 50 lbs. lime to 400 gallons of water; put in the sulphur and add the lime as the water begins to boil; let it boil 10 to 15 minutes; let the boiler be only three parts full when the lime is added, else they will boil over. The result is certain destruction of all ticks in the sheep." I have examined the sheep at various times during the year, and they have thriven well, the fleeces being particularly free and well-grown. As to the extra quantity of soap required, the same would apply I imagine to all dips where sulphur is employed [yes and to all where sulphur is not used.—J.P.R.], as I know from experience of scouring how difficult it is to get it out of the wool, and I have no hesitation in saying that sheepowners are greatly indebted to you for the discovery of the curative properties of lime and sulphur. Happily I have not had occasion to use the mixture for scab, but for ticks I would give it the preference over any other dipping stuff I have ever used.

With kindest regards and many thanks for your hints, believe me, faithfully yours,

JOHN SANDERSON.

J. P. ROWE, Esq., Mount Battery, Mansfield.

Since writing the letter to the *Mercury* of the 29th October, 1870, to which is appended Dr. Rowe's and Mr. Sanderson's letters as to the efficacy of the sulphur and lime mixture, I have had many conflicting accounts as to the virtues of carbolic acid. From all that I can learn, it appears to be susceptible of

adulteration, and in a number of instances failure has been the result of its use; but at the same time I am not prepared to say that some of those failures may not have been as much to be attributed to want of care on the part of the sheepowner as to the inferior or spurious character of the carbolic acid. There is one thing very certain, that so far as the reports I have received enable me to judge, the great bulk of the flocks in which a thorough cure has been effected up to the present time were dipped in sulphur and tobacco and sulphur and lime. Some few sheepowners have used arsenic in various proportions from $\frac{1}{2}$ an ounce and under down to a very small quantity per gallon of tobacco water and sulphur, and report that they have been successful in effecting a cure without loss of sheep; others who have used arsenic have met with losses by deaths, although not to any considerable extent.

On more than one occasion I have publicly stated my dislike to arsenic,—although I know from my own experience that properly applied it is a very certain remedy,—and my objection to it is as strong as ever. I consider it a dangerous application, inasmuch as you can never be quite certain that from unexplained causes, possibly of an atmospherical nature, a number of sheep may be destroyed when the greatest amount of care has been exercised by the sheepowner both in preparing and applying the mixture.

Specifics and nostrums of all kinds, puffed in the Press by agents of empirical pretenders, I would strongly advise sheepowners to refrain from using. I could name more than one sheepowner who has had during the past season reason to regret having been induced to use an application, the component parts of which are known only to the compounder. It appears to me to be the height of folly for any sensible man to run the risk of using a mixture, the nature of which he is profoundly ignorant of, when he can choose more than one mixture now well known to be thorough cures, while they are harmless to the constitution of the animal.

There is one point on which I fear some of those sheepowners who fail in the first place to effect a cure do not give sufficient attention to, and that is the necessity for a very minute examination of the sheep for spots of scab before they are dipped. When any exist they should be carefully hand dressed with a stronger mixture than the ordinary dip.

Melbourne, 12th January, 1872.

SIR,

I HAVE the honor to thank you for your Report and copy of amended Scab Act, enclosed in your letter of the 5th instant, which has just reached me.

Whilst doing so I will take occasion to bring under your notice how very effective the lime and sulphur dressing has proved in this Colony. The failures which have followed its use have been fewer than what have succeeded any other sort of dipping; whilst its inexpensiveness, and the simplicity with which it may be prepared for use, and the speed with which it is made ready, are very much in its favour. As compared with tobacco it has another great advantage, that it has no variety in strength or quality, so that no selection of material is necessary.

Congratulating you on the success of your Scab Act,—

I have, &c.,

EDWARD M. CURR.

The Chief Inspector of Sheep, Tasmania.

The above letter from Mr. Curr shows that in the beginning of 1872 lime and sulphur had become the most highly esteemed scab-destroying preparation in Victoria.

I may state with safety that since 1871 more sheep have been cleansed in Tasmania with sulphur and lime than with any other mixture, and for two years past I have invariably recommended its use in preference to all other preparations.

I always recommend at the same time that in addition to the quantity of sulphur required to kill the scab insect, a quantity of raw sulphur should also be mixed with the dipping material, in order to remain on the sheep as a protection from re-infection when turned back on the same run, which generally had to be done in Tasmania, particularly in the case of very small settlers, of which the sheep-owning body there largely consist.

JAMES WHYTE.

No. 8.

SCAB IN SHEEP IN VICTORIA.

PAPER by Mr. EDWARD M. CURR, Chief Inspector of Stock, Victoria.

(Laid before the Conference of Chief Inspectors of Stock, in November, 1874.)

THE Conference having expressed their wish to be put in possession of the principal facts connected with scab in sheep in Victoria during the last twelve years, I may state shortly that at the end of the year 1862, when the eradication of scab was undertaken, that there were at least 5,000,000 of sheep in the Colony suffering from that malady. With few exceptions these sheep were running in flocks of two or three thousand each, in paddocks which were often insecure, which, coupled with the fact that the law provided no means by which the travelling of doubtful flocks could be prevented, led to the reinfection of runs which had already been cleaned, so that large bodies of sheep had to be cleaned twice over. Notwithstanding those disadvantages and drawbacks, however, the numbers of clean sheep slowly but steadily increased under the pressure of fines and licences to the extent of (say) £50,000.

In the meantime, about three years since, the Scab Act now in force, in which for the first time power was taken to prevent the travelling of diseased flocks, came into operation, and under it the disease has been reduced to 120,000 sheep now in quarantine. This result has been effected at the cost of a very

great (but necessary) inconvenience to the owners of sheep, as it might almost be said that the travelling of sheep during the last three years, except under the authority of an Inspector, has not been allowed. In carrying out this policy the support of the Boards of Advice has been a great advantage. The use of lime and sulphur, as a dressing for scab, has also largely contributed to the eradication of the disease.

Of the 120,000 sheep still in quarantine in Victoria, it may be stated that the majority of them are depasturing in country in which it is most difficult to muster sheep. Still, of these, I am in hopes that the moiety, at least, will prove clean. Could they be all mustered, a fortnight certainly would dispose of this remnant, and finally rid the Colony of scab. The difficulty lies in their collection alone, some stragglers carrying the germs of infection usually being left out. To meet this it will, in my opinion, be necessary in some cases to remove the sheep from the runs in question, so as to ensure the destruction of all the stragglers.

EDWARD M. CURR.

12th November, 1874.

No. 9.

SCAB IN SHEEP IN NEW SOUTH WALES.

PAPER by Mr. ALEXANDER BRUCE, Chief Inspector of Stock, New South Wales.

STATEMENT showing the number of Sheep infected during the outbreak of Scab in 1862-3, the progress made in cleansing them, and the result of the several dressings used.

DEALT WITH AND ACCOUNTED FOR UNDER THE ACT OF 1861.

<i>Ascertained Numbers.</i>		
Number destroyed and paid for by the Government	40,503	
Ditto by owners of adjoining lands	2339	42,842
<i>Estimated Numbers.</i>		
Died of poverty and disease	15,000	
Drowned in the floods	8000	
Boiled down	21,000	
Destroyed without compensation	1000	
Killed by arsenic and other poisonous dressings	20,349	
Ditto tobacco and sulphur	2000	
	22,349	
Cleansed before the present Act came into force	33,000	100,349
		143,191
DEALT WITH AND ACCOUNTED FOR UNDER THE ACT OF 1863.		

<i>Ascertained Numbers.</i>		
Number licensed and cleansed	199,809	
Destroyed and boiled down	7000	206,809
Total number of Sheep infected during the late outbreak		350,000

PROGRESS MADE IN CLEANSING.

Cleansed between March, 1864 (when the Act of 1863 came into force), and 30th November, same year	102,282
Ditto, 30th November, 1864, and 30th November, 1865	82,433
Ditto, 30th November, 1865, and 14th July, 1866.....	15,094
	<hr/>
	199,809

The Colony was declared clean on 1st July, 1866,—in something less than two years and a half after the Act came into operation,—but an outbreak occurred in a small lot after that in the County of Cumberland, which was soon cleaned.

RESULT of Dressings used.

Description of Dressing.	Numbers dressed.	Result of Dressing.		Result of Dressing.	
		Failure, and other Dressings tried.	Cleansed.	Failure, and other Dressings tried.	Cleansed.
Allen's Specific	80,021	80,021	—	—	—
Hayes' Specific	87,186	80,931	6255	—	—
Arsenic, and arsenic and tobacco..	18,555	9271	9284	170,223	15,539
Tobacco and sulphur.....	184,270	..	92,530	—	—
Tobacco and lime			30,299	—	—
Tobacco and mercurial dip			61,441	—	184,270
				As above..	199,809

From this it will be observed that tobacco and sulphur was by far the most effective dressing.

13th November, 1874.

ALEX. BRUCE.

SCAB IN SHEEP IN SOUTH AUSTRALIA.

PAPER by Mr. C. J. VALENTINE, Chief Inspector of Sheep, South Australia.

IN submitting a statement relative to Scab in South Australia, I will confine myself to the last nine and a half years. At the beginning of that period the flocks were clean, but in the latter part of 1865 some doubtful flocks existed, and scab appeared in 1866 in about 4000 sheep. Several other outbreaks occurred during the next few years. In 1867 over 3000 sheep were destroyed, when a Quarantine Act was passed, which provided for the detention of infected and doubtful sheep within prescribed boundaries. This proved a very useful measure. Quarantine districts were continued until 1870, when diseased or doubtful sheep no longer existed in South Australia. During the four years referred to, about 70,000 sheep were infected. The sheep were cleansed with tobacco and sulphur, and lime and sulphur dressings. An Act which has been in force since 1859, providing that any travelling sheep found scabby should be destroyed, had a most beneficial effect in preventing the spread of disease.

C. J. VALENTINE.

CATARRH IN SHEEP.

PAPER prepared by Mr. ALEXANDER BRUCE, Chief Inspector of Sheep, New South Wales.

(Laid before the Conference of Chief Inspectors of Stock, held in Sydney in November, 1874.)

THE term catarrh is derived from the Greek word, *Karrappew*, to flow down, and the disease may be described in general terms as a catarrhal fever, attended with an excessive flow of mucus from the nose and eyes.

There are two descriptions of catarrh—1st, what is known as *common catarrh*, a non-infectious disease affecting sheep at times in all parts of the world; and 2nd, *malignant catarrh*, peculiar to Australia. For the sake of convenience, the former will, in dealing with the subject, be termed *common catarrh*, and the latter simply *catarrh*, as it is the name by which it is known in these Colonies—not that it is the correct one.

Common catarrh may be either confined to individual sheep; or it may affect the greater part of a flock. In Australia it usually occurs in the winter or beginning of spring, and the sheep attacked are generally poor and weakly. It is most common among sheep which are housed. Those affected exhibit the usual catarrhal symptoms of discharge from the nostrils, deflection from the eyes, coughing, and sneezing; but they do not, as in malignant catarrh, altogether stop feeding. This form of the disease is also distinguishable from malignant catarrh by the slightness of the discharge, the mildness of the attendant fever, and the absence of the laboured breathing which is always present in the latter. The chief tests, however, as to whether the disease is *malignant* catarrh are, its infectious character, the rapid development of virulent symptoms, and the large ratio of deaths. A flock should never be pronounced catarrhed because the symptoms in one or two sheep or the *post mortem* appearances are the same as those in some cases of malignant catarrh. In the absence of decidedly characteristic symptoms, the circumstantial evidence (so to speak) must be exceedingly strong to warrant the opinion that the attack is anything but *common* catarrh. Although this description of catarrh sometimes kills through the destruction of the nasal passages, and gullet like *malignant*, it is more to be dreaded for its sequel, as the inflammation of the lining of the nostrils and gullet which accompanies the disease extends at times to the wind-pipe and the respiratory organs of the chest, terminating in consumption, which sooner or later carries off the sheep.

Common catarrh is sometimes caused by cold and exposure; and the sheep should, in that case, where practicable, be removed to a more sheltered locality. At other times the affection is clearly epidemic, and must be allowed to run its course. Care, however, should always be taken not to allow sheep showing any catarrhal symptoms to come in contact with others, until it has been ascertained with certainty that the ailment is not *malignant* catarrh.

Malignant catarrh was first observed in June, 1834, among the flocks of Mr. Robert Campbell, of Burrowa; and although that may not have been the first outbreak of the disease, it then assumed a virulence which it never previously exhibited; for such a disease—carrying off, as it did, more than *three-fourths* of the infected flocks—could not possibly have existed without at once attracting attention. In the following March, April, and May, catarrh showed itself on several stations on the Lachlan River in the Binalong District, and appeared to spread from the one station to the other. It shortly afterwards broke out in the Goulburn and Yass Districts; and from these centres it seems to have spread throughout this Colony, and even to the southern parts of Victoria. To such an extent were its ravages carried, that in 1838 a very restrictive Catarrh Act was passed to stay the further spread of the disease, and was renewed from time to time till 1842. It was then amended, and again in 1843 and 1846, and lastly in 1853 by the Act 17 Victoria, No. 27, which is still in force. These measures had the effect of greatly diminishing the disease, and of confining it to the more upland and colder portions of the Colony, where in some instances it seems to be constitutional, but is even there now fortunately of rare occurrence, through the improved management of the sheep, and partly also through some of the runs on which sheep were at one time kept being now stocked with cattle.

CAUSES OF CATARRH.

The causes of catarrh may be considered as *originating* and *existing*.

Originating Causes.—Catarrh has been held by some to be a specific disease introduced with Saxon sheep imported shortly before its outbreak in this Colony; by others it is considered to have been caused by the lowering effect which the cross with these importations had upon the stamina of colonial sheep; and by some again the disease has been set down as an epidemic; while others hold that, as it did not appear for a considerable time after the introduction of sheep into this Colony, it is a disease which originated here through mismanagement.

The assumption that catarrh was introduced by Saxon sheep would appear to be unfounded, for there is no record whatever of malignant or infectious catarrh existing in Saxony or in any other part of Europe. It may be, however, that the crossing of the Australian sheep with the comparatively delicate and carefully nurtured Saxon Merino tended to assist the deterioration which the gross mismanagement of some sheep-owners was then bringing about; and the opinions of those who take the second view of the question may be so far correct.

The opinion that catarrh is an epidemic, or rather an epizootic disease, is erroneous; for, if it were an epizootic, it would have occurred frequently and generally in all parts of this and the neighbouring Colonies, which it has not, and no legislation could possibly have arrested its spread, as we know the Catarrh Acts have so effectually done.

We now come to the opinion that catarrh originated in Australia, and through mismanagement of the sheep; and there is no doubt but that it did so, in the injurious system of breeding followed, and the maltreatment and neglect of the sheep on the part of some of the sheepowners who had taken to sheep-farming in the colder and more upland districts without any previous knowledge or experience. These, then, were the true originating causes of catarrh in its malignant form, and would again produce the same disease under similar circumstances. They will be shortly noticed in detail, and for the sake of perspicuity are treated in two sub-divisions—the Predisposing and Exciting Originating causes—which again will be particularized in the order of the degree in which it is considered they affected the sheep.

PREDISPOSING CAUSES.

1. Breeding "in and in" for a lengthened period without selection.
2. Breeding and rearing lambs twice a year from the same ewes.
3. A continued system of breeding from rams or ewes which were weak or sickly, or too old, or too young.
4. The weakening of the constitution of the sheep by the use of mercurial preparations in curing scab.
5. Previous general debilitating diseases, such as fluke or foot-rot.

There cannot be a doubt but that No. 1 under this head was one of the chief, if not the chief predisposing originating cause of the disease. "In and in" breeding, when carried out in a healthy flock or herd under a proper system of selection, by a competent judge of the stock which he is breeding, both as regards their shape and their constitutional organization, need not deteriorate. It is only when attempted by incompetent or careless breeders who fail to make the proper selections—or perhaps, as was apparently done by many of the sheepowners at the time catarrh first shewed itself, make no selection whatever—that "in and in" breeding is hurtful. This is now a well-established fact; and while we know on the one hand that the healthiest and most valuable flocks and herds in the world are reared up under this system with proper selection, we see on the other the most worthless sheep and cattle produced by "in and in" breeding without selection. We thus find that the rule of like begetting like which pervades this system is a power either for good or evil, according as it is controlled and directed; and we can easily understand how a predisposition to disease would be intensified in the progeny of sheep, where the ewe and ram had, from a lengthened course of mismanagement of the flock to which they both belonged, become constitutionally weak and misshapen, and how comparatively harmless common catarrh became in such sheep, under a system of ill treatment, over-crowding, and exposure, on bleak upland runs, both a highly virulent and infectious or contagious disease.

Cause 2.—*Breeding and rearing lambs twice a year from the same ewes.*—This course was followed to a considerable extent, by many of the sheep-farmers of that period, on runs and in seasons wholly unsuitable for such a mode of management, and it is scarcely possible to imagine anything that would have a more debilitating effect, both on the ewes themselves and their progeny. To withstand the evil effects of even an occasional double crop of lambs in the same year, the ewes must be young and strong, and on the best pasture, while the climate must be mild and the season favourable.

The effects of *Cause 3*, although not so apparent in sheep which arrive quickly at maturity as in cattle, are undeniable both on the size and stamina of the sheep. If proof of this were required, it can be readily found in the small size of cattle on stations where breeding and fattening are combined, where there are no heifer paddocks, and where the spaying of the old cows is not followed.

Causes 4 & 5.—Although there is no proof on record that sheep which had been dressed with mercurial preparations for the cure of scab or which had suffered from fluke or foot-rot were more subject to catarrh than others, there is little doubt but that the general and indiscriminate use of preparations of

mercury in the cure of scab and prevalence of fluke and foot-rot in sheep depastured on the upland runs, all tended to assist in the weakening of the constitution which preceded many of the outbreaks of catarrh.

That such flagrant violations of the correct principles of breeding as the predisposing causes here mentioned, and especially Causes 1 & 2, should have brought on this disease, is only what might have been expected; and when in conjunction with these the exciting causes which will next be enumerated are considered, the only wonder is that the disease did not break out before it did.

SECONDARY OR EXCITING ORIGINATING CAUSES.

These causes may be enumerated as follow:—

1. Disorder of the digestive organs, arising from dry, innutritious, burnt, or frost-bitten food, and bad water.
2. Sending sheep out in cold mornings from an over-crowded yard, causing them to get chilled.
3. Dogging and overheating sheep full of grass and yarding them while a cold wind or frost is prevalent, especially when newly shorn.
4. A long course of dry, cold, windy, or frosty weather, following a dry summer.
5. Sudden changes in the temperature, such as sometimes take place, inducing chills and suppression of perspiration.
6. Folding sheep on low-lying damp ground, on the banks of rivers or creeks, or in wet, dirty yards.

These exciting or secondary originating causes have, like the predisposing, been arranged in the order of the degree in which it is considered they were most liable to have affected sheep at the time catarrh broke out. The bare enumeration of them will be enough to show the deadly influence they must have exercised upon sheep which had been rendered so susceptible to disease by the predisposing causes which have already been mentioned. It may, however, be remarked that, in by far the greater number of outbreaks which occurred in early times, disorder of the digestive organs was the exciting cause, and that it is so in the few cases which now occur.

To show that these exciting causes were prevalent at the time catarrh broke out in the Colony, we have only to remind our readers that sheep-farming was then in its infancy, and that even those who had acquired a knowledge of the management of stock in the Old Country had many trials and difficulties to encounter in the Colonies. With Government men for servants, droughts, floods, cold winters, scab, and native dogs, the best managers had the hardest of battles to fight to keep their flocks in health and obtain a fair increase from them. If such was the case, with all their previous knowledge and experience, what, after a few years of these trials, must have been the condition of the flocks of those who commenced sheep farming without any home or colonial experience,—especially on the cold upland country, on the coast range, where many of the runs were then situated, but one as it actually was of poverty and deterioration, followed by disease of a most virulent and infectious nature.

EXISTING CAUSES.

At the present day the causes of catarrh are hereditary or constitutional predisposition, and infection or contagion. There is no properly authenticated case on record of a fresh outbreak of catarrh originating in sheep after the disease was noticed in 1834, without hereditary predisposition or predisposition arising from the effects of a previous attack. These existing causes are still, of course, materially influenced by—or rather they never operate without—some of the exciting or secondary causes which have been enumerated, and principally, as has already been remarked, by disorder of the digestive organs.

As outbreaks of catarrh, of greater or lesser magnitude, occurred almost every other year in certain localities, it is apparent that the disease must be either constitutional or endemic (local). That it is constitutional and not endemic, is proved by the fact that sheep which have been once affected and removed to another part of the Colony have, after a lapse of perhaps six or eight months and even longer, suffered again and again from the disease in the warmer localities to which they were taken, and where no fresh infection could have reached them. Then, again, this predisposition may be either the effect of a previous attack occasioned by infection, or it may be hereditary. That one attack will render sheep liable to another, even although moved to fresh pasture in another part of the Colony—salt-bush excepted—is now quite certain; and there is no doubt but the disease is also hereditary; indeed, some good authorities even go so far as to say that it is so to the second and third generations, and instance cases in support of their views.

That catarrh is either infectious or contagious, or perhaps both, there does not now seem to be any doubt, and the general opinion is that the infection (the term is used in a general sense) is spread by the discharge from the nostrils of the diseased sheep. It is most probable, however, that, as in the rinderpest and other plagues, the nature of which have been carefully investigated, the fomites, or germs of the disease, are diffused, to a large extent, by the excretions of the animal, so also the infection, in cases of catarrh, may be spread in the same manner. In whatever way it is conveyed, the most certain means of infecting a flock—even more so than by inoculating the nostrils of the sound sheep with the discharge from the infected—is to put a few diseased sheep into a sound flock; and even feeding sound sheep over infected ground seems more certain to convey the disease than by inoculating in the manner described.

All breeds and ages of sheep are liable to infection, but young sheep under three years old are very much more susceptible than old or full-grown. Old sheep not unfrequently escape scatheless where young

sheep would have been certain to have been infected. This fact may perhaps account for the opinion still held by some, that catarrh is not infectious or contagious. Like every other infectious or contagious disease, however, it spreads by no known certain rule. Sometimes sound sheep have been folded for the night with infected sheep, and for many nights in adjoining yards, without being attacked; and the discharge from the nostril of a diseased sheep has been placed in that of a sound one without communicating the disease. Again, sound sheep have sometimes been infected by merely crossing a run over which catarrhed sheep have passed, while on other occasions sound sheep have under apparently similar circumstances escaped infection.

The infection or non-infection of sheep must also depend upon the length of time which has elapsed between the passing of the infected and sound flocks over the same ground, the state of the weather in the interval, and the health of the sheep. How long under different circumstances the infection will remain potent in the vehicles in which it is ordinarily transmitted from the one sheep to the other is doubtful, but that it will do so for a considerable time is certain; for sheep have received the infection on ground from which catarrhed sheep had been removed for more than seven months; and it is the opinion of those best qualified to judge that sound sheep ought not to be allowed to go upon ground where a catarrhed flock had been running until twelve months have expired from the time the diseased sheep left it.

It has been found that, by carefully weeding out and destroying every sheep in an infected flock which shows the least symptom of disease, and changing the sheep to other ground, the disease will generally leave them; it is, therefore, reasonable to presume that catarrh is not infectious until the symptoms are pretty clearly developed.

NATURE OF CATARRH.

Catarrh, or as it is sometimes termed Australian catarrh, like consumption in the human subject, as we have seen, sometimes arises from exciting causes working upon a frame constitutionally predisposed to the disease; and, like consumption, the predisposition may be either hereditary or the effect of a previous attack. Here, however, the resemblance ceases, for catarrh may be conveyed from one sheep to another by infection, and its most correct definition seems to be that it is a hereditary or constitutional disease, which becomes on its outbreak a decidedly infectious or contagious catarrhal fever, and runs its course with great rapidity. Of all diseases, however, in the human subject or among the lower animals, catarrh seems to be more analogous to rinderpest than to any other in its origin and cause and the manner in which it spreads—although not so infectious as that terrible scourge, and differing from it also in other respects. Like the spontaneous outbreaks (*i.e.*, outbreaks arising from predisposition and not from infection) of rinderpest, those of catarrh are always traceable to stock or the progeny of stock brought from a cold, exposed, upland country,* and, like rinderpest, catarrh is not nearly so destructive in its natural habitat in that class of country as in a more genial climate. Farther, it is not at all improbable, that the same mismanagement and bad treatment which it is believed were the *originating causes* of catarrh in this Colony may have also originated rinderpest; and we know that the same causes which keep the germs of catarrh alive in our flocks are also continuing to perpetuate rinderpest in Asia and Europe.

Catarrh is rarely seen in the saltbush country, nor does it exist for any length of time when taken there by infected sheep. This is so well known that infected and doubtful sheep were, when it was practicable to do so, removed to this class of country from the higher, and cured, at least during their stay.

Outbreaks of catarrh usually occur in the months from April to September inclusive, and of these most frequently, perhaps, in June and July. Outbreaks in the autumn generally prevail more or less during the whole of the winter,—the weather having a most material effect on the number and virulence of the attacks. When catarrh attacks sheep at other seasons than those mentioned, the outbreak is traceable to some sudden and violent change of the temperature, especially after shearing.

The first outbreak of catarrh noticed (that already alluded to, on Mr. Campbell's station) took place in a dry frosty winter following upon a drouthy summer; and a very large majority of the outbreaks which have occurred since that time have done so under similar circumstances in respect to weather.

The deaths in an infected flock range from five to seventy-five per cent., according to the season of the year, the state of the weather, the nature of the feed, the locality in which the outbreak occurs, the age and stamina of the sheep, and their treatment. Summer attacks are much more deadly than winter; but at whatever season and under whatever circumstances they do take place, they are generally comparatively mild at first, and gradually become more virulent till they reach the climax, when they moderate in something like the same ratio as they increase. Young sheep in good condition about the age of eighteen months are found not only to be the most susceptible of infection, but also to lose the largest percentage in deaths. In full-grown and aged sheep, again, fat sheep are both more liable to become infected and to be carried off than poor sheep.

Death occurs in some cases within six hours of the first symptom of the sheep being infected; sometimes in twelve hours, and sometimes not before ninety-six hours. In the majority of cases, however, death occurs in twenty-four hours after the first decided symptoms of the disease are discerned.

Like other infectious or contagious diseases, catarrh neither attacks nor kills by any rule; in fact, it seems even more capricious in this respect, as well as in its spread, than most other diseases. Sometimes the ewe is the victim while her lamb is spared, and at other times the lamb is taken and its mother escapes.

* The sheep first observed to be affected with catarrh, although then in a comparatively low-lying and warm part of the Colony, had been brought from a run on the Coast Range in the county of Argyle, some twelve months previous to the disease breaking out.

It has been said that flocks crossed with sheep of the coarser breeds, such as Leicester or Southdowns, were less liable to catarrh than the Merino. This has been disputed; and some owners, who have tried crossing, without getting rid of the disease, have done so by again taking to the Merino. In either case, where the change was attended with success, it is believed that the result was attained more by the introduction of healthier blood into the flocks than by the crossing with any particular breed.

SYMPTOMS.

The course of the disease in catarrh is generally divided into three stages, and that arrangement will be adopted here in detailing the symptoms.

First stage.—In this stage (which lasts from two to twenty-six hours) there may be all or any of the following symptoms:—

1st. Sneezing, snorting, or coughing—especially at night—perhaps as long as thirty-six hours previous to the sheep ceasing to feed. These sounds are to be heard more or less in different forms in all stages of the disease, and a combination of them—a peculiar snorting or croupy cough—is one of the most decided symptoms; but it is more prevalent in the first than in the later stages of the disease.

2. Hanging head, drooping ears, general lassitude, listlessness, dulness, lingering behind and hanging back from the flock, unwillingness to move, indisposition to feed, ceasing to ruminate.

3. The nostrils hot and humid, their lining membrane inflamed and red, with increased secretion of mucus from that membrane, and a discharge, at first of a clear limpid colour, but gradually becoming thick and ropy.

4. The eyes languid and suffused, in some cases a profuse flow of tears, while in others a discharge of matter encrusts the eyelids, and the inner part of the eyelids of a red or a yellowish red colour.

5. The tongue parched, general fever, perspiration obstructed, pulse quick, hard, and irregular, throbbing of the heart, diminution of secretions, except in the inflamed membranes.

Second stage (duration from four to forty-eight hours).—All the symptoms of the first stage will have increased in force, with the exception of the coughing, which is not always present at this stage; but when it is, it is evidently painful, and is brought on by the least movement. There will now also be all or either of the following symptoms:—

1. Great restlessness, heaviness of the head, and a desire to rest it. No appetite for food, stupid appearance, and frequently symptoms of great pain.

2. External surface and internal membrane of the nose and other portions of the head swollen.

3. The interior of the nose of an intense florid hue, with the blood-vessels filled with minute injections; the secretions from the nostrils—which are frequently large, thick, and of a yellow colour—harden on the nostrils and impede respiration, and they may be from one or both nostrils.

4. Respiration impeded, and evidently painful, through the secretions plugging up the nostrils. The animal gasps for breath, seems in dread of suffocation, and throws the head up in its attempts to clear the nostrils by snorting and sneezing.

5. The eyes are more and more suffused, red, and inflamed, especially at the conjunctiva, and there is generally a considerable discharge from them.

6. The general fever is great, and suppression of the urine and costiveness frequently set in.

Third stage (lasting from eight hours to four days).—1. In this stage the fever will have passed, and general debility ensued. The sheep will frequently be found lying down resting its head, or it may become stupid and stagger about unable to direct its steps, going up against trees, and into water-holes or camp-fires; and those symptoms increase as death approaches.

2. In some cases the face, lips, and tongue are now much swollen, as are also the nostrils, which exhibit the highest state of inflammation, the deadly purple or leaden hue. These are stopped or nearly so by the discharge from them, which has lessened in quantity, but becomes thick and glutinous, and sometimes streaked with blood, generally from both nostrils. The snorting and sneezing to clear the respiratory passages will be increased, and will not unfrequently be accompanied by coughing and expectorations of foetid matter mixed with blood.

3. The eyes are greatly inflamed, and there is generally a profuse flow of tears, while incrustations of hardened mucus are formed around the eyelids.

4. The mouth is dry and parched, the pulse feeble, the eye becomes more and more glassy, trembling, vertigo, blindness, and insensibility ensue, with deliriousness, and wringing and throwing up of the head, and the sheep lies down and dies.

These symptoms will, however, in all the stages, like the *post-mortem* appearances, depend in a great measure upon the seat of the disease. If it be in the sinuses of the head and gullet,—then the attack may be termed “nasal catarrh,”—swelling of the nose and lips, with a discharge from the nose and eyes, will be present: while if the lower portion of the bronchial tubes and the lungs are involved—when it may be designated “pulmonary catarrh”—there may be little or no swelling of the head or discharge, and the only noticeable symptoms will likely be coughing and laboured breathing. It would seem also that the climate and season of the year have a considerable influence in determining the seat of the disease and the class of symptoms. Thus, nasal catarrh is more common in a cold country and in winter than pulmonary, while that form is much oftener to be met with in districts where the climate is genial, and during the warm weather of autumn, than in the colder districts and winter season.

In some cases the catarrh kills by the destruction of the windpipe and bronchial tubes, and the head and lungs display little or no symptoms of the disease. In these cases the sheep will die as from suffocation, and on examination the lining of the windpipe and bronchial tubes will display symptoms of having undergone intense inflammation—being completely destroyed, and so rotten as to be easily pinched or torn to pieces. The lungs will be slightly congested, and around them will be a considerable quantity of a pink-coloured frothy mucus.

POST MORTEM APPEARANCES.

The stomach is generally impacted with undigested hard food, while the fæces accumulate in both the large and small intestines in large hard lumps, producing abrasions of the mucous membrane. The liver is usually perfectly free from disease, but the gall-bladder is frequently very much distended. The rest of the abdominal viscera and bladder are generally in a healthy state. These appearances vary with the different forms of the disease, and may be treated as those of 1st, *Nasal Catarrh*; 2nd, *Pulmonary Catarrh*; and 3rd, of the *Combined form*, partaking more or less of both Nasal and Pulmonary Catarrh.

1. *Nasal Catarrh*.—In this form of the disease the brain is not found to be affected, but the little brain (the *cerebellum*) is, and its blood-vessels show decided symptoms of inflammation, being highly injected or gorged with blood. There are also occasional secretions of a serous fluid in the cavity of the little brain, and in the lateral ventricles. The frontal sinuses (the continuation of the nostrils) show indications of intense inflammation, and are plugged up with sero-purulent matter or black clotted blood. The whole of the nasal cavity presents the most intense redness, from a florid to a dark red, mingled with patches of a leaden hue. The turbinated bones (the thin knife-like bones in the nose) are exceedingly florid throughout, as if they had been filled with a very minute injection. This is not confined to the membrane covering their surface, but extends to the whole of their substance. Indeed, the enlarged injected blood-vessels present themselves, in this form of the disease, in every part of the interior of the nasal cavity, and a very thick viscid matter is effused in the turbinated bones as well as on the *septimnaris* (the division between the nostrils), which could be scraped off with a knife. On cutting the substance of the nostrils a quantity of serous fluid or florid blood is discharged. In this form of the disease the heart and large veins are generally found to be gorged with black blood.

2. In *Pulmonary Catarrh* it is found, on dissection, that generally in both the right and left lobes of the lungs, but sometimes in only one of them, and then generally in the right, the mucous membrane is red to a greater or less extent, with the appearance of small red points aggregated closely together; while the pleuræ *pulmonalis* and *costalis* exhibit traces of a high degree of inflammation, and there are frothy mucous effusions in the cavity of the chest. In others again, where pneumonia prevails, the lungs present an increase of weight and density, are infiltrated with a frothy mucus of a bloody tinge and clotted blood, and their external surface is of a gray or violet colour; while in others the lungs assume the density of hepatization, and the vessels are full of hardened lymph, displaying when cut into, the appearance of marble. In most of these cases the mucous membrane lining the bronchial tubes and windpipe is highly inflamed, and mucous effused all along the course of the respiratory passages. In this—the pulmonary form of the disease—all the large veins are generally full, and the right auricle of the heart is invariably gorged, while the left auricle and right and left ventricles are empty.

3. *Combined form*.—Here there will be a combination of the different symptoms and *post mortem* appearances which have already been noticed, but they will vary in these cases according to the class of causes which predominate.

Of the two forms of the disease, the pulmonary is not only the most common, but also by far the most fatal.

In some of the cases mentioned by Dr. Bennett in his able report on the first outbreak of Catarrh in 1834 (from which I have freely culled in compiling the technical portions of this paper) the stomach was healthy and filled with well-digested food, while the whole of the alimentary canal was free from disorder, and the gall-bladder filled with healthy bile; the disease carrying off the sheep through the destruction of the respiratory organs of the chest, the bronchial tubes, and the sinuses of the head.

The cause of the difference in the *post mortem* appearances noticed by Dr. Bennett, and those described above as being almost always present in the outbreaks of catarrh which now occur, seems to lie in the cause of the attack. The outbreaks which he then investigated must have originated from contagion or infection, and not, as they almost invariably now do, from secondary causes working upon a frame predisposed to the disease. Thus, where infection or contagion is the cause, the sheep require little or no preparation, so to speak, to enable the disease to incubate and ripen; and, therefore, the *post mortem* symptoms and appearances, such as constipation and inflammation of the intestines, which are present in sheep where the attack has been caused by bad food and predisposition to the disease, are not present.

Both classes of symptoms and *post mortem* appearances are to be met with, but that described by Dr. Bennett is now very seldom met with, as the effect of the Catarrh Act has been to confine diseased sheep to their own runs, and to protect the sound flocks from infection and contagion.

PREVENTIVE AND REMEDIAL MEASURES.

If the history, causes, and nature of catarrh be considered, it may with safety be affirmed that the development of fresh cases can be easily prevented, and are unlikely to occur except from infection and contagion. And to show that this is the case, we will briefly review the causes of the disease and the amount of risk which may be now apprehended from them.

In the present day, the prejudice against "*in and in*" breeding is so strong and general as to leave little room for fear of fresh cases of catarrh arising from that cause; for it is unlikely, with the prevalence of this feeling, that even close breeding will be attempted by any but those whose flocks are of considerable excellence; and the fact that they are so is a sufficient guarantee that the breeder is qualified to make the proper selections, and may be safely allowed to follow this system of breeding.

While on this subject, although not strictly within the scope of this paper, it may be remarked that the dislike to "in and in" or even "close" breeding has in this Colony been carried a great deal too far; and the frequent and sometimes even violent changes in breed and blood which have been made, have prevented owners from obtaining that improvement in their sheep, or that uniformity of type and character, which their heavy outlay for stud rams entitle them to expect. If owners are unable, from the inferiority of their sheep or their want of knowledge, to adopt a system of "close" breeding, they might at least obtain their stud sheep from the same breeder, so long as his flocks were of sufficient excellence and were sound and healthy, and thus secure a large share of the advantages of "in and in" breeding with comparatively little risk.

In adopting this or any other course of purchasing rams, a careful selection of a well-developed healthy frame, devoid as far as possible of the defects of the ewes to which they are to be put, ought always to be kept in view, as well as a valuable fleece; and if it is so, the risk of catarrh and other disorders would be greatly diminished. The hap-hazard system now followed by many breeders of purchasing stud rams from different improved flocks, both imported and colonial, without regard to the strain of blood, and without selection, is not only a source of disappointment and loss to the purchaser, but also to a certain extent of risk to our flocks.

The practice of *breeding and rearing two crops of lambs in one year* from the same ewes is now seldom or never adopted, for its folly is too apparent, and the inducement, with the present low price of sheep, too small to lead owners to follow it.

Breeding from *too old* or *too young* or *weakly* sheep is still too common; and although the effect is not immediately noticed, and may not of itself bring about catarrh, the practice is a deteriorating and thriftless one, and ought to cease.

Fluke in sheep is still prevalent, but with due care and the use of the proper medicine (sulphate of iron and Liverpool salt in proportions of 1 in 10), stations upon which it was next to impossible to keep sheep healthy are now almost entirely free from fluke. As to *foot-rot*, the turning out of the sheep and ordinary care will in most cases remove all risk from this cause. And with regard to the debilitating effect of *mercurial dressings* for scab, which were so generally used when catarrh broke out, it may be said that the risk from this cause has entirely ceased; for not only are these dressings now never used, but there is no scab in the Colony.

There cannot be a doubt but that the fencing in of the runs and turning out the sheep would be the most effectual way of removing the exciting or secondary causes of catarrh. If left to themselves on an ordinary large run, even in the colder parts of the Colony, sheep can always, and in all weathers obtain shelter, and find comparatively dry and comfortable quarters day and night; for not only does their natural instinct lead them to seek the higher ground to camp at night and in bad weather, but it enables them also to detect, sooner than any shepherd can, the approach of bad weather, and from what quarter it is to be expected, and to take shelter accordingly. It would thus be scarcely possibly, except perhaps in the more thickly grassed intermediate districts, after a long drought, for catarrh to break out, even in this way. It is to shepherding and folding, or rather to the mismanagement to which shepherded sheep are always more or less liable, that we owe the exciting causes of catarrh; and if sheep were turned out and fresh healthy blood freely introduced into the flocks whose blood was tainted with catarrh, that, as well as many other diseases to which sheep are now subject, would with ordinary attention disappear. Great, however, as these advantages would be, they are not a tithe of those which would be secured to the Colony in every way by fencing in the runs and turning out sheep.*

Till this can be brought about, the best course would be to destroy the native dogs and camp the sheep out; and if a combined and simultaneous effort in this direction were made, either voluntarily or under legislative enactment, by the owners in the different districts, the eradication of the dogs might be readily and cheaply effected. In the meantime, those who continue to shepherd and fold their sheep should erect large brush yards, or rather small paddocks, on the best sites, sheltered from all weathers. Hitherto, the convenience of a water supply for the shepherd, more than the best position for the sheep, has too frequently been the chief study in the selection of sites for sheep stations.

Where again there is a taint or suspicion of catarrh in the sheep, fresh healthy blood should be frequently and freely introduced; and, as the climate of the districts in which the flocks requiring fresh blood are depastured is cold and trying, the introductions should be made, as far as possible, from healthy flocks reared in a comparatively cold climate.

CURE.

There is no really practical cure for catarrh. The immersion and swimming of the sheep in cold water (in a river or lagoon) has been said by some to be a specific for catarrh, while others who have tried it, report that it is utterly useless; and the proof that it is so lies in the fact that this treatment is now

* See the valuable treatise on Fencing, by Mr. Gordon, Chief Inspector of Sheep for Queensland.

never followed. Bleeding and physicing again have been tried with varied results; but here the trouble and cost of the treatment, even if it were successful, would be a bar to its adoption. The only way in which the disease has been successfully dealt with was to take the sheep to fresh pasture, especially to salt-bush, and while doing so, to kill every sheep showing any symptoms of disease. This, however, the law very properly prohibits, as other sheep would be certain to be contaminated by the infected flocks. The next best course is to move them from station to station on their own run, and keep destroying those showing any symptoms of the infection; but, even although this course should be successful in stopping the disease in the infected flock, it would be attended with all but certain risk of infecting the other sheep on the same run, as well as those on the adjoining runs. If, again, the infected sheep are kept upon the ground on which they are depastured when the disease broke out, it is not unlikely that twenty or even fifty per cent. of them will die; and although the sheep are confined in this way, the risk of the infection spreading to other flocks while the disease is running its course is too great to be safely encountered. Besides, as such sheep are liable to periodical outbreaks, all this risk and trouble would, in that case, have to be frequently encountered, for the sheep that recover are almost certain to be again affected. There certainly is not the same risk of the disease showing in such sheep at certain seasons as at others; and, if they were close to market they might then be fattened and disposed of; but by the time they would be allowed by the law to travel, after an attack, the safest season would be over, and the losses and damages which would attend an outbreak on the road are too heavy for the owner who has to drive his sheep any distance to risk.

Looking, therefore, at the subject, in all its bearings, it would seem that the safest course for an owner of catarrhed sheep, both as regards his own interest and that of the Colony, is to boil down the whole flock at once. But while this course is recommended to the owner, it is considered that here, as in the case of scab, the sheepowners as a class should, for the sake of the greater protection this course would afford, come to the assistance of the owner who takes it, and that a measure should at once be introduced into the Legislature dealing with catarrh the same as with scab. Catarrhed sheep would thus be destroyed, and their owner would receive as compensation two-thirds of their market value, supposing they were free from infection when they were destroyed. There are but few districts in which the disease is now likely to show itself, and the compensation required would not amount to a large sum; while it would nevertheless be a great boon to the owners of the catarrhed sheep amidst the heavy losses which such a visitation entails. The present law is, to say the least of it, a rigorous and impolitic one. It quarantines an owner's sheep on his run for six months, and even prevents him from coming within a quarter of a mile of its boundaries, or of any road passing through it, without allowing him any compensation. The consequence is that outbreaks of catarrh have frequently been concealed, and the disease has spread through this concealment.

There is certainly at times considerable difficulty in saying what is catarrh and what is not. This is only what might be expected in outbreaks occurring from predisposition, for in these attacks the part or organ affected would depend upon circumstances, which would of course vary in different flocks. That is, the part or organ in which the disease finds its principal seat would (within certain limits) be the weakest in its frame, and that, of course, would be different in different flocks. The question, however, with which legislation has to deal is not to what class of disorders an outbreak belongs, but whether or not the disease is infectious or contagious. Whether, therefore, the outbreak be one of catarrh properly so called, or some other infectious or contagious disorder, means should be adopted to stay its spread; and if sheep showing any of the symptoms of catarrh are quarantined, as they ought to be for a time, the presence or absence of infectious or contagious symptoms will soon determine whether or not the disease is catarrh, or any other calling for legislative control. If this point be settled, the necessary steps for controlling and eradicating the disease could be adopted; and to avoid all risk of any failure through inability to identify the disease, the measure should be made so comprehensive as to allow the Governor and the Executive Council to issue regulations for the eradication of *any* infectious or contagious disease in sheep, other than scab or catarrh.

ALEX. BRUCE.

No. 12.

WORM DISEASE IN SHEEP.

PAPER prepared by Mr. P. R. GORDON, Chief Inspector of Sheep, Queensland.

(Laid before the Conference of Chief Inspectors of Stock, held in Sydney in November, 1874.)

I do not claim in the following remarks to have made any new discovery as to the causes or cure of worms in sheep—a disease that has occasioned immense losses amongst the flocks in many portions of Queensland. My object is to lay before the Members of the Conference a few practical facts in connection with the disease in the experience of Queensland sheepowners, in the hope that they may assist in directing inquiry on the subject into the proper channel.

Worm disease first made its appearance in Queensland, in its present epizootic form, in 1871; but for fourteen years preceding that date intestinal worms were periodically to be met with in sheep in various portions of the Coast Districts. Many owners recognize the disease as identical with that which decimated the flocks in the Clarence and Richmond Districts many years ago. It is only within the last three years however that the disease has been known to exist west of the Main Coast Range.

OPINIONS AS TO THE NATURE AND CAUSE OF THE DISEASE.

It is now well known that the disease is caused by a description of worm infesting the stomach, intestines, and frequently the lungs of sheep, and known as *Strongylus*.

The opinions of practical men in Queensland—so far as they have come under my notice—as to the cause of the disease, may be summarized as follows :—

First.—The most generally accepted theory is that worms originated from overstocking, and the consequent disappearance from the pastures of many saline herbs and plants.

Second.—That they are due to certain geological formations, and

Third.—By some it is supposed that they are propagated and disseminated by kangaroos, wallabies, and other marsupials.

In support of the first the following facts are adduced :—

- 1.—Worms are unknown in sheep pastured in newly-occupied country.
- 2.—That they can to a very large extent be prevented by a liberal use of salt, and
- 3.—They are but of recent development in most portions of Australia.

Those who attribute their presence to certain geological formations point to the well-known fact that whilst sheep pastured on granite or slate formations are the first to be attacked, trap, basalt, or soils abounding in salts of lime, have—except in rare instances, where it has been introduced by travelling sheep—enjoyed an immunity from the disease.

With respect to the third supposed cause, the circumstance already mentioned, of worms being unknown in recently occupied country, would, to some extent, appear to set aside the theory that they originated with the marsupials; but the fact that in some districts the centres of large plains are sound whilst sheep pastured on the margins of the same plains (the feeding grounds of the wallabies and kangaroos) are infested with worms, which seem to indicate that they are in some instances disseminated in this way.

It is now generally believed that, whatever the cause of worms, they are to a large extent disseminated by the dung of sheep, and this opinion is in perfect harmony with the opinions of Cobbold in Europe, and the best authorities in Australia.

My own deductions, based on information supplied me by my staff, as well as by many sheepowners in different parts of the Colony, favour the belief that each of these causes, and all combined, may tend to produce and spread the disease; and for the following amongst other reasons :—

1. In the case of sheep affected with worms travelling from the coast interiorward, it is found that whilst they establish the disease on previous healthy pasturage along their line of route, this has never been found to be the case beyond a point where recently taken-up under-stocked country commences.

2. Having reference to geological considerations, we find that country of trap-rock formation on the margin of the Downs are exempt from worms, although completely surrounded by runs of granite formation, on which the disease has for years prevailed.

A circumstance came within my observation a few weeks ago which I consider valuable, not only as throwing light on this phase of the question, but as verifying in a remarkable manner the correctness of Mr. Farrer's deductions—in his valuable pamphlet on grasses and sheep-farming—as to granite soils being favourable to worms. Mr. Donald Gunn, of Pikedale, forwarded to me a sample of salt collected by him on a run in his district, the soil of which is composed principally of disintegrated granite. The sample was taken from the surface of a small flat which had recently been temporarily under water, the salt having been deposited during the process of evaporation. Mr. Gunn's object in forwarding it to me was to challenge the correctness of my views as to the value of salt in the prevention of worms; because, on the run where this sample of salt was found, worms had to some extent been present in the sheep for years. On my showing the salt to Mr. Staiger, our Government Analytical Chemist, he at once pronounced it to contain a large amount of potash, and the usual test confirmed his statement. Mr. Farrer shows that by analysis granite contains a large percentage of potassic salts, and that the pasturage of soils composed of disintegrated granite must therefore be unhealthy.

Independently of the above incident, my experience confirms Mr. Farrer's statement as to granite soils favouring the presence of worms.

3. I am not prepared with evidence to authorise me in hazarding an opinion as to the worms being propagated by marsupials, nor do I attach much importance to the circumstance, as kangaroos and wallabies have invariably been found to be the prey of parasites infesting cattle depasturing on the same grounds. The same cause would operate alike in both cases.

That the disease has been sown broadcast by means of travelling sheep over country in which, in all probability, it never would have originated, is, I think, beyond doubt. I must guard myself against being understood as holding the opinion that worm disease is contagious in the usual acceptation of that term; but in the sense in which fluke may be understood to be contagious—that is, by contaminating the pasturage,—I consider worms to be highly contagious, and hence my reason for so strongly urging upon my Government, at various times, the necessity for joint action by the Colonies on the matter. In America there does not appear to be two opinions on the subject. It is there believed that the worms were imported with sheep from England, and burning pasture and camping grounds appears to be the only successful mode known to the Americans of checking its spread.

But one or two well-authenticated facts in my own Colony would appear to me to establish this beyond a doubt. Thus, for instance, the circumstance before alluded to, of the disease having been established by sheep travelled inland on country previously free from it. And again, the circumstance that in certain districts, the soils of which we should consider inimical to the disease—such for instance as the black volcanic soil of the Darling Downs, through which there is constant traffic in travelling sheep—the disease has obtained a footing, whereas in other districts, possessing exactly similar soil and pasturage, but through which no travelling sheep from diseased districts have passed, worms are as yet entirely unknown.

MEANS OF CURE AND PREVENTION SUGGESTED.

Cure.—In speaking of a cure I would wish it to be understood as referring only to means adopted for destroying worms in the case of sheep already affected. I have had no opportunity of testing the sulphur and nitre cure so highly spoken of in Victoria, although experiments with this and powdered areco nut are being conducted at the present moment in Queensland. Should the latter be successful in effecting a cure, as I have strong hopes will be the case, it will open the question as to the value of strong astringents (of which there is an endless variety in these Colonies) as sheep medicines. Turpentine and linseed oil was found successful, as was also salt and sulphur, in many instances, in expelling the worms in the early history of the disease in Queensland; but strange to say, both completely failed to effect a cure in second and subsequent attacks of the disease in the same runs. Salt, where given in unlimited quantities, has in some instances been successful in effecting a cure in the case of young sheep, but I have been assured that it has failed in others.

Prevention.—As the cause or causes of worms are still matter of speculation, the means of prevention suggested or recommended must also be looked upon as speculative. We have been most fortunate in Queensland in having—in Mr. Haly, of Taabinga—a gentleman who, sparing neither trouble nor expense, has gone into an enquiry of the subject with a determination and intelligence unequalled perhaps by any other sheepowner in the Colonies. To the unceasing exertions of this gentleman we are indebted for the duty on salt having been entirely removed, and also for a vote of £500 to initiate an inquiry by a practical and scientific board into the causes of disease in animals and plants. Mr. Haly has been a heavy sufferer by worms, but after experimenting with many agents, he has at last, by the unlimited use of salt in his flocks, and by lightly stocking his runs, succeeded in reducing his losses to the smallest minimum, about 1½ per cent. and that in a district where the losses on some of the neighbouring runs have been alarmingly heavy. I consider it also due to this gentleman to state that more than eight years ago, when a Member of the Legislative Assembly, he predicted an outbreak of disease similar to that now decimating our flocks, in consequence of impoverishing our pastures by overstocking.

If, as is very generally supposed, the rapid development of worms is due to the disappearance from our pastures of herbs and grasses which contained more or less of saline properties, the direction in which preventive measures should be attempted is plainly indicated. If, as has been authoritatively stated, some descriptions of herbs and grasses possess the property more than others, of taking up the salts from the soil, enquiry should be directed to such, and means adopted for testing their suitability in different soils. I believe that much can be done in this way and by preventing overstocking. For instance, salt bush and myall have been transplanted to, and found to flourish in soils not the natural habitat of saline plants. And although they are found not to be so strongly impregnated with salt as when grown in their natural soil, they still retain their character as that of salt plants.

Of the value of light stocking, I cannot adduce a more striking instance than that of the land enclosed on each side of the line of Railway traversing the Darling Downs. On that land, in consequence of its being protected from stock of all kinds, the original grasses and herbs of the district have reappeared, and are growing to luxuriance side by side with the stunted and comparatively innutritious grasses which have taken their place in the heavily stocked sheep paddocks.

In conclusion, I would remark that it has long been my conviction, that if a system of spelling paddocks by regular rotation were universally adopted, many of the diseases that infest our flocks would rapidly disappear.

P. R. GORDON.

No. 13.

FLUKE IN SHEEP.

PAPER prepared by Mr. EDWARD M. CURR, Chief Inspector of Stock, Victoria.

(Laid before the Conference of Chief Inspectors of Sheep, held in Sydney, in November, 1874.)

To the naturalist and helminthologist the study of the fluke parasite and the phenomena connected with its being, are matters of interest which have but slight charms for the sheepowner, however important to his welfare they may eventually prove. Perhaps they refer to matters too near home to be to his taste, and as a rule he has no patience but with what we will call the practical side of the subject, to which I propose to confine the few remarks I have to offer on a topic which of late has been worn somewhat threadbare.

The first circumstance which claims the attention of Victorian sheepowners with respect to this disease is its great spread during the last few years. Originally, as is well known, it confined its ravages to

certain cold, dank, sour-grassed mountainous localities, whilst of late it has gradually been encroaching on neighbourhoods in which heretofore it had never been heard of, and in which it was believed on all hands that its existence was impossible. It is natural to inquire how this is to be accounted for; and how it has happened that the fluke has of late taken possession of large tracts of country, in which during the thirty previous years of its occupation it was entirely unknown.

As regards this change, it seems probable that it may be accounted for in this way: that before fluke spread in Victoria, sheep were shepherded; they had as a rule plenty of excellent grass and to spare, and consequently that they lived on wholesome food, the result being, as old residents in the Colony will remember, that the sheep of those days were well-grown and healthy. Neither was it usual at the time to buy store sheep to fatten, so that there was but little travelling of stock, and diseases were, as a rule, confined to the localities to which by some means they had been brought.

This state of things came to an end, however, when paddocks took the place of shepherds; it was then too that overstocking became a general practice, and our sheep first became acquainted with starvation and unwholesome diet. A further consequence of overstocking was that the prime grasses never being allowed to seed, disappeared; the kangaroo grasses were eaten out, the myrnong and yams were almost exterminated, and their places were supplied by the least nutritious of our indigenous grasses, and not a few unwholesome exotic weeds. From that period, too, our sheep, reduced in many cases to a state bordering on chronic semi-starvation, dwindled in size and lost stamina, offering an easy prey to the first disease which might present itself. The purchase of store sheep, which the buyer reckoned on quickly fattening and selling off, also became a very prevalent custom, and as such sheep were obtained from localities in which fluke prevailed the disease gradually obtained the proportions which we now see. In other words, animals suffering from fluke were imported on the hitherto clean runs, on the least healthy portions of which they deposited the seeds of disease, which in due time were taken up by animals driven by hunger to feed in localities which otherwise they would have avoided.

The questions then crop up, where will fluke end? Can it possibly extend to country which has heretofore escaped its ravages? Is it to become general throughout the Colonies? Premising the fluke has already been acclimatized on runs on which a few years ago the owners, who freely purchased fluky sheep, ridiculed the idea of its propagation, it seems to me that we are not yet in a position to determine the possible geographical limits of this disease. On this subject, whilst admitting the probability of a large extent of country, notably our salt-bush plains, being wanting in the condition necessary to the propagation of fluke, and setting aside the fact that I find it impossible to believe that steps will not soon be taken by owners which will in a great measure put an end to this scourge, I will ask the reader to remember, in considering the possible expansion of which this disease is capable here, that the acclimatization of animals is, as a rule, gradual, but the extent to which it may be carried very large—that a man, horse, dog, or sheep, for instance, transferred direct from the tropics, and subjected to the conditions of nature as they exist in Iceland, would undoubtedly perish, whilst there would nevertheless be no difficulty in the gradual extension of the tropical man, horse, dog, or sheep to that island. In the same manner, it is well known that vegetables will in many instances become gradually accustomed to conditions which at first were found to be very unfavourable to them. As one instance out of many, I may adduce the fact that, of a quantity of English wheat sown in some parts of Western Africa, but a moderate portion will seed, whilst in each ear which matures there will only be three or four grains of corn, but that after a few sowings the produce will gradually become acclimatized, strong, and plentiful. In like manner, I may remark, that many of our vegetables are now readily grown in Victoria in perfection in localities in which, to my knowledge, they could only be reared with considerable trouble thirty years ago. Hence, as modern authors have demonstrated, that in the laws which affect animals and vegetables there are many marked and undeniable coincidences, far from saying that the general plan of nature stops short with parasites, everything would lead to the inference that they are governed by conditions analogous to those of their hosts; so that it seems to me that we are not yet in a position to determine to what portions of this continent fluke might not, if unchecked, eventually extend, the probability being in favour of the increased area of its habitat.

Touching the reduction and prevention of fluke which, in the majority of cases, I am persuaded is a matter easily attainable, the first steps should undoubtedly be the lessening of the number of the sheep on lands on which this disease prevails, the substitution of healthy flocks for those now diseased, the destruction, as far as possible, of the ova of the fluke, and the securing to the flocks conditions of existence directly favourable to general health, and specially adverse to the economy of this parasite. As regards the destruction of ova, I believe it can be effected practically in most cases by burning off all rank vegetation and the drainage of wet grounds; whilst a considerable reduction of stock on fluky runs, by allowing the better grasses to grow, and securing the animal a plentiful supply of wholesome food, at the same time taking away from it the necessity for browsing in sour and unhealthy spots, will very much reduce the frequency of this disease. In addition, in many places, as is well known, a liberal allowance of salt to the sheep is not only beneficial but an absolute condition to health. On lands where such measures fail, I think it may be said that the condition of nature, unassisted by further efforts of art, which are not perhaps at present practicable, are unsuited to sheep; and that the sooner the owner accepts the fact and acts on it, the sooner he will consult his own interest.

In conclusion, I cannot help expressing the opinion that fluke is a disease which proper management will confine to very narrow limits. Along the country verging on the Australian Alps from Victoria to Southern Queensland, and in a few other districts, it will undoubtedly always prevail to some extent; whilst in such localities it may be very much kept under by a liberal use of salt and sulphate of iron, and Mr. Charles Thomas's remedy, which cannot be too much recommended. As a rule, fluke in Victoria is

the natural result of improper sheep-farming—in other words, of overstocking; and the sheep-farmer, instead of lessening the quantity of his stock, or increasing the carrying capabilities of his land, has, in too many instances, contented himself with living in hopes that some medicines would be discovered which would enable him to go on defying the laws of nature, as he has been doing; forgetting that even if a cure for fluke were discovered, that, as things are, some other disease would inevitably take its place—that in fact health and unwholesome food cannot long co-exist.

At present, what the sheep-farmer in many cases has to consider is—whether it suits him best to feed five healthy sheep or six unhealthy ones. The great parent of disease in Australia is overstocking—unwholesome food.

EDWARD M. CURR.

Sydney, 6 November, 1874.

No. 14.

FOOT-ROT IN SHEEP.

PAPER prepared by Mr. C. J. VALENTINE, Chief Inspector of Stock, South Australia.

(Laid before the Conference of Chief Inspectors of Sheep, held in Sydney, in November, 1874.)

IN making remarks on foot-rot, it appears to be only repeating common matter which is known to nearly all persons connected with the working management of sheep in the Colonies, and I fear that I shall not be able to throw any new light on the subject. As a disease which causes great depreciation in the value of sheep and entailing heavy expenses on sheepowners, it has been known through most parts of the Colonies, and is dreaded by many more than an outbreak of scab.

Investigations held by professional men in Great Britain have caused them to conclude that there are several distinct affections of the foot which are commonly included under the term foot-rot. True foot-rot prevails on heavy soils during wet weather. The affection generally commences in the skin above the hoof between the digits or clefts of the hoof, thence extending downwards to the membrane of the sensitive foot; inflammation is set up, which increasing, causes an exudation of purulent matter, in which stage the disease is very bad.

One form of foot-rot occurs on dry sandy soils, and is sometimes prevalent in hot, dry summers. Minute particles of grit enter the horn tubes, and ultimately get into the interior of the foot, causing inflammation and exudation, finally extensive separation of the horny covering from the secreting structures.

A third form depends upon the overgrowth of the hoof, and occurs commonly in soft soils in which there is abundant moisture.

Injuries inflicted during journeys, punctures from thorns, nails, wounds from sharp stones, constitute another form of the disease. Such are looked upon in Great Britain as the different causes of foot-rot.

Randall, in his work on Sheep, considers that foot-rot in America is much more virulent than in Europe, where, as described by Youatt, it presents essentially different early symptoms, but is evidently the same disease.

No doubt there are many trifling causes from which foot-rot arises in the Colonies, but I consider the disease arises principally from sheep pasturing on rich soils with plenty of moisture, long wet grass keeping the foot constantly damp (previous to fencing, assisted by camping in dirty yards), the clefts of the foot are filled or choked with dirt, thereby causing much irritation, and consequent on that inflammation of the interior structures of the foot; suppuration then takes place and spreads under the hoof, and in many instances in the advanced stages to the coronet, causing it to separate. Scald by some is considered to be the first stage of the disease, but I am inclined to think such is not the fact in all cases. After scald sheep pasturing on sandy soils with excessive heat in the day after heavy dews, particles are introduced into the foot causing inflammation, and disease is the necessary consequence. Sheep have been pastured over wet plains of rich black soil, but so thoroughly washed have the feet become by the constant moving through water that scarcely any cases of foot-rot occurred. This was in limestone country. Wherever sheep have their feet washed naturally, although on rich soil, foot-rot appears only in isolated cases.

It appears in many instances where it cannot be reasonably accounted for. Some seasons more than others appear to favour the development of the disease, but no record has been kept that I am aware of the different seasons, which might be used as a guide to show when foot-rot might be expected to be more virulent than usual. I find country on which it was considered impossible to place sheep, in consequence of the disease appearing in so virulent a form, being free from it for some years, notwithstanding that the state of the land was not apparently altered; since which the disease has again appeared. A case occurred in which foot-rot broke out in swampy country, attributed by the owner to the sheep not camping on dry ground. It ran through about 3000 sheep, in not a very virulent form, but still bad; no other sheep suffered, and no other sheep have suffered on the same country since.

In regard to foot-rot in South Australia, the sheep on country to the north of Adelaide are remarkably free from it, the disease appearing only in isolated cases. On some large properties it is

entirely unknown, and but few long hoofs even require paring. Such was not the case on country to the east and south-east of Adelaide, where it was found on some stations in its worst and most destructive form. Much of this country was moist land, with long grass and too often dirty yards; here the staff of foot-rotters was formidable, and a terrible expense to the owner. This staff of men were kept up to pare and dress with all sorts of remedies some thousands of sheep on large stations, and the number of 'unfortunate animals limping about, poor, haggard, and decidedly unprofitable, was a very heavy percentage on the total number of sheep. All this has been altered since fencing has been introduced and an improved system of management adopted. Fencing has allowed the sheep more freedom and a choice of camps; they are no longer driven in a hurry over sticky, muddy ground, and enclosed in a camp strongly heated with the manure deposited for years. In a report from the worst district, preventative measures have reduced the disease to a minimum, and it is spoken of as trifling, varying slightly with the seasons. Although foot-rot has decreased amongst large holders, I am afraid that it is rather on the increase among small ones. As their number increases in favourable localities for foot-rot, there it appears to come to the front again; they are not so ready to adopt an improved system of management, and are often ignorant of the disease and its cause. Owning only a few sheep, they do not consider it of sufficient importance to inquire or make any outlay to prevent a disease from which they are only beginning to feel the ill effects.

Is it contagious? I am inclined against the opinion, in the general sense of the term. No doubt matter exuded from a diseased foot would inoculate another if placed in it. Foot-rot will run through a flock in a few weeks—yet sheep pastured on the same country shortly after will not become diseased. It appears to me foot-rot arises from the state of the country, the health of the sheep, and the peculiarity of the season, as sheep placed on the same country at different seasons of the year are differently affected.

After all, the most important thing is, can foot-rot be prevented or cured? I am afraid not entirely eradicated. Much may be done to prevent the disease, and sheep may be cured by good management; but this will not prevent the disease from breaking out again and again in the same sheep. The instances of the disease breaking out in different places after the sheep or country have been free from it for a long time show that there are causes producing foot-rot which at present we are not able to explain. In some places the merino suffers more than the long-woolled sheep, and again we find it reversed. As a rule, I think the merino suffers the worst. In others foot-rot disappears for some years and then breaks out without any apparent reason. The disease causes so much loss, and entails such heavy expense on sheep-owners, that it would be well worthy for an enquiry to be made by competent persons to trace out the different circumstances which cause the disease.

A number of different remedies have been used, each more or less successful according to the carefulness with which they are applied. Butyr of antimony, bluestone, and quick-lime, were and are still with many favourite remedies. To a great extent arsenic has superseded these; it is a cheap and efficacious remedy, and easily applied to a large number of sheep. Sheep scalded, if run through a trough with hot arsenic water, are prevented from the disease extending further, and on those stations where the disease exists, sheep are passed through a solution of arsenic, varying from 2 ozs. to 4 ozs. to the gallon, about every six weeks, during the worst season of the year. Sheep when in the second stage, and with long hoofs, should be pared, and the diseased foot thoroughly cleansed and washed with arsenic water prior to passing through the trough. Sheep should stand after passing through the trough in a clean yard, to allow the arsenic to take effect. Arsenic is recommended as being efficacious, and, where thousands of sheep require to be treated, cheap and easily applied; but I would impress on all that, no matter what the remedy may be, unless care and attention is paid to the paring of the feet, to the mixing of the solution, and the general application, arsenic will not be of more use than other remedies badly applied. I find that carelessness in the treatment of all diseases is generally the cause of failure.

C. J. VALENTINE.

No. 15.

FOOT-ROT IN SHEEP.

PAPER by Mr. P. R. GORDON, Chief Inspector of Sheep, Queensland.

MEMO.—Having given some attention to the subject of foot-rot, my experience has led me to class malignant foot-rot as a decidedly contagious disease. Several well-authenticated instances on the black soil of Darling Downs have shown that it can be communicated by contagion, and permanently stamped out with the sheep immediately effected.

Seven years ago, Mr. E. M. Curr, of Victoria, supplied me with information as to the use of carbolic acid, and acting on my advice, that agent has been used most successfully in the cure of foot-rot. It combines with water by boiling from ten to twenty minutes, and is used in the trough at a temperature of 110° Fahr., and in the proportion of a pint of the acid to four gallons of water; or it may be applied in the form of an emulsion prepared by means of soft soap.

Too much importance cannot be placed on the fact that very much of the success of a cure depends on the surgical operation. Every diseased part of the foot *must* be laid open, even if this should necessitate the removal of the *whole of the hoof*.

P. R. GORDON.

No. 16.

LETTER from Chief Secretary, Victoria, to Colonial Secretary of New South Wales, in regard to Border Quarantine.

Victoria, Chief Secretary's Office, Melbourne, 7 October, 1874.

SIR,

WITH reference to the conversation which some of the Members of this Government had with you during your recent visit to Melbourne, on the subject of a quarantine ground for sheep being established at Moama, or one of the other crossing-places of the Murray, to facilitate the export of sheep from Victoria into New South Wales,—I have the honor to request that you will, according to your promise, bring this matter under the consideration of your colleagues, with a view, if possible, to meet the wishes of the Government of Victoria.

The grounds upon which it seems reasonable to urge the question at the present time are, that scab has been nearly eradicated in Victoria, after great outlay, and it can be stated with confidence that the disease does not exist at all, and has not for a very lengthened period, among those flocks from which sheep of a high class would most probably be selected for export; such sheep, for instance, as have been sent habitually into the Colony of New South Wales, to a limited extent, *via* Sydney, under the Quarantine Regulations, without any evil effects resulting to the latter Colony from the trade.

And I may also remind you that, when some years ago sheep from Victoria were permitted to enter New South Wales at Echuca, the precautionary means that were adopted to prevent them conveying infection were so efficacious that in no case, I am informed, did sheep introduce disease into your territory, although the risk then was much greater than it could be now, as scab prevailed extensively in Victoria, while it is confined at the present time to a few districts.

The experience obtained in this Colony confirms the view that, under proper Quarantine Regulations, rigidly enforced, sheep may be moved without danger into clean districts.

By the provisions of the Scab Act of Victoria no sheep can be taken into a clean district from one that is uncertain, without being dipped twice under the personal superintendence of a qualified officer; and I have it on the authority of the Chief Inspector of Stock that these means have had the effect of allowing sheep to be transferred without injurious effects resulting in any single instance, though the system has been in operation for some years, and has therefore been thoroughly tested.

I have only, in conclusion, to say that, although it would be a great boon to the breeders of first-class sheep in Victoria to have New South Wales open to them as a market for their stock, it is worthy of your notice that the persons who are the most urgent on this Government to have the existing restrictions removed or abated are the owners of stations in New South Wales, who expect to derive great advantages from introducing improved strains of blood into their flocks.

I have, &c.,

GEO. B. KERFORD.

No. 17.

CORRESPONDENCE respecting Fluke in Travelling Sheep in South-eastern District in South Australia.

(Laid before the Conference by C. J. VALENTINE, Esq.)

Mr. ARCHIBALD COOKE to the Commissioner of Crown Lands.

Wellington, 29 June, 1874.

SIR,

I HAVE sent you a copy of an extract from a letter from a Lacepede firm, signed Donald Matheson, a confidential clerk.

I enclose the package of the fluke sent to me. I have no practical knowledge of the disease. It will be a serious matter to allow this plague to get into the country.

I have, &c.,

ARCHIBALD COOKE.

D. MATHESON to ARCHIBALD COOKE, Esq.

Kingston, 25 June, 1874.

DEAR SIR,

I WISH particularly to draw your attention to some 7000 or 8000 sheep now on the road from M'Innis's station, taken by Jenkin Coles, and will likely pass through your run and others if permitted. When passing here the butchers bought 200, and the sheep are found to be full of the "fluke," which I believe was unknown in this district before. I enclose you two or three of the fluke, taken out of one of the sheep killed by the butchers here. It was through Mr. Vaughan that the matter was discovered here. It seems some one or two of the sheep were dropped on Morris's run; and, as they had a suspicion about the sheep, they killed those dropped, and examined and found the "fluke," which he brought over here in a vial, and which led to the examination of those killed here. Mr. Vaughan says he will report to the Inspector, but we thought to send you this notice, in case it might be dangerous for these sheep to pass over your country. The sheep will be about the Salt Creek now.

Yours, &c.,

D. MATHESON.

Mr. H. T. MORRIS to the Commissioner of Crown Lands.

Albany, 7th July, 1874.

SIR,

THIS morning, I took the liberty of telegraphing to you, intimating that I had heard, on good authority, that a flock of sheep, travelling up from the South-east, were affected with fluke.

It is more than probable that you were acquainted with the fact before my telegram reached you; but, notwithstanding, as soon as the circumstance came to my knowledge, I deemed it my duty to inform the Government of it.

It is certainly a contagious and dangerous disease; and the sheep in this Colony generally being in a most healthy condition, especially north of the River Murray, it would be a great misfortune should any disease be introduced amongst them. I do not know if there is any Act to show how this disease can be dealt with, but I fancy not. Should such be the case, some special and immediate action is necessary, as the ground on which they must depasture may cause the disease to spread to other flocks travelling on the same country.

If a number of persons engaged in pastoral pursuits could be readily got together, probably the best way to meet the difficulty would be for them to subscribe *pro rata*, according to the number of sheep they would buy, and destroy them; but as this cannot be quickly done, and should the sheep alluded to be in such a state as to endanger other flocks, it is to be hoped the Government will be able to step in and destroy them, and compensate the owners.

I have reason to know that the gentlemen who have purchased these sheep had not the least idea of their being diseased; it is therefore a great hardship for them.

I have, &c.,

H. T. MORRIS.

Mr. S. DEERING to the Chief Inspector of Sheep, Adelaide.

(578-74.)

Crown Lands Office, Adelaide, 9th July, 1874.

SIR,

I HAVE the honor, by direction of the Honorable the Commissioner, to inform you that the Government have appointed you, in conjunction with the gentlemen named in the margin [H. T. Morris and A. McFarlane] to be a Board of Inquiry in the matter of a flock of about 6,800 sheep stopped on Policeman's Point, on the Coorong.

The Government desire that you will proceed to Policeman's Point and examine the sheep which are reported as being diseased with fluke. It will be desirable that several sheep should be killed to prove practically that fluke exists in them.

You will report—

- 1st. As to whether you consider the flock to be badly diseased?
- 2nd. Whether, in your opinion, there would be danger of contagion to other sheep depasturing over the same land?
- 3rd. Whether it is desirable that the flock should be destroyed; or, if not, whether they might be placed in a locality away from the travelling stock road in quarantine for not less than four months?
- 4th. As to the value of the sheep, and whether you consider that the Government, in the event of the flock having to be destroyed, should pay any portion of the value, and if so what that portion should be?
- 5th. Whether you think that the owners may be supposed to have known of the state of the flock before buying; and, if so, whether they have a claim on the Government in the event of the sheep having to be destroyed?
- 6th. Whether, in your opinion, it is desirable that a part of the South-eastern district in which fluke is known to exist should be declared a quarantine district, with a view to prevent, if possible, the disease being extended to other parts of the Colony which are now free from the evil?

I have, &c.,

SAML. DEERING, *Secretary.*

The Board of Inquiry to the Commissioner of Crown Lands.

Magrath's Flat, 11th July, 1874.

SIR,

WE have the honor to inform you that, in accordance with your instructions of the 9th instant, we carefully examined the sheep detained at Policeman's Point, on the Coorong, on the 10th instant, and beg to report as follows:—

1st. We selected and killed ten sheep, some fat and, to external appearance, healthy—all were picked to show the general state of the flock; we found them in every instance very badly diseased with fluke, and we are of opinion that there is not a sound sheep in the whole flock.

2nd. We are of opinion there would be danger of contagion, and consider the country on which these sheep have been detained should be immediately proclaimed a quarantine ground.

3rd. It is with reluctance that we have arrived at the conclusion that the sheep should be killed. We are satisfied from the state of the flock that they should not on any account be moved from where they now are. From the nature of this country it would be impossible to keep so large a flock in quarantine; even if this could be done, there is no probability of their recovering in country of this description.

4th. We value the sheep at seven shillings per head. We consider the Government should pay to the owners a portion of the value, and that the amount should be four shillings per head. The owners should be required to kill and burn the sheep at their own cost, and be allowed to take the skins and fat.

5th. We believe that the owners were not aware of the sheep being diseased with fluke; but, from the advanced stage of the disease, we are surprised that the seller was not aware of the sheep being in so bad a state. We consider that if the owners had known the sheep were diseased when purchasing, they would have no claim on the Government.

6th. From the state of these sheep we consider it is absolutely necessary that steps should be taken at once to examine the flocks from which they were brought, and others if deemed necessary, and where fluke is found to exist the sheep should be placed in quarantine, with a view to prevent the disease being extended to other parts of the Colony. We are also of opinion that power should be immediately obtained, authorising the inspectors to examine the flocks of the Colony for fluke and any other infectious or contagious disease. We think it necessary to state these sheep came from the "Woakwine Run," near the coast, about North of Rivioli Bay, and are now depasturing on the Coorong, near the Salt Creek, about 130 miles from Adelaide. In conclusion we would recommend the immediate necessity of preventing all sheep from crossing the River Murray from the south-east until the state of the flocks can be ascertained.

We have, &c.,

C. J. VALENTINE,	} <i>The Board of Inquiry.</i>
H. T. MORRIS,	
ALLAN MCFARLANE,	

MEMO. of Sheep Destroyed.

No. 1. Sheep selected as likely to be diseased, from external appearance, on being opened it presented a shocking sight; there was more than a quart of dirty brown liquid in the abdomen—evidently, on examination, from the liver, which was much enlarged and the ducts expanded to a most unnatural size, and filled with "fluke;" the heart and lungs were in an abnormal state; the heart was enlarged, thin, and flabby; the lungs were almost white; the flesh was of a greenish yellow colour; the sides of the sheep were discoloured, and apparently as if granulated; the lips were pallid and bloodless; and the eyes bloodless and dull.

No. 2. Sheep selected as being fat, and one of the most healthy-looking; however, on being opened, the ducts of the liver were distended with "fluke," and the sheep, though fat, presented a most unhealthy appearance, the flesh being of a greenish yellow, showing it to be unwholesome, and unfit for human food.

The whole ten killed were almost equally diseased; in three, the intestines were adherent to the enlarged liver, and in one instance adhered to the side of the sheep. It is apparent that if sheep in this state are allowed to travel, especially at this season of the year, it is more than probable that the germs of the disease would be disseminated throughout the Colony.

Considering it prudent to fix a line across which the diseased sheep should not come, we instructed Mr. Pavey, of Woods' Wells, to draw a plough furrow across the Government Reserve, at the northern end; this will also act as a caution to travelling sheep.

C. J. VALENTINE.
H. T. MORRIS.
ALLAN MCFARLANE.

Mr. S. DEERING to the Chief Inspector of Sheep, Adelaide.

(599-74.)

Crown Lands Office, Adelaide, 15th July, 1874.

SIR,

WITH reference to the report of the Board of Inquiry (845-74) appointed to examine a flock of sheep travelling along the Coorong, and said to be badly diseased with fluke, in which it is recommended that the sheep should be killed, and the owners partially compensated, I have the honor, by direction of the Hon. the Commissioner, to request that you will state whether, in your opinion, there is any other course open to the Government to adopt—for instance, could a piece of dry country be found near where the sheep are at present, upon which they could be placed for a time? Or, failing that, would it be advisable to allow the sheep to travel back again over the route they have already come, and on to the run from which they were purchased?

If neither of these courses can be adopted, I am to request you to make any suggestions that may occur to you which would meet the difficulty.

I am, &c.,

SAML. DEERING, *Secretary.*

The Chief Inspector of Sheep, Adelaide, to the Secretary Crown Lands.

Inspector of Sheep Office, Adelaide, 15th July, 1874.

SIR,

IN reply to your inquiry of the 15th instant, as to whether there is any other course open than that recommended by the Board of Inquiry for the Government to adopt in reference to the diseased sheep at Policeman's Point, I have the honor to state the travelling reserve on which the sheep now are, although extending back three or four miles, would be insufficient to keep the sheep on for a few months, and there is no country adjacent on which the Government are able to place the sheep. I understand the owners endeavoured to get country on which to place the sheep, but did not succeed.

If the sheep are allowed to travel back, the owners of clean stations would and do strongly object to their return, and it would be manifestly unjust to owners to allow the sheep to travel again over clean country. Even should the sheep be able to return to Woakwine I think I may state the late owner would not take them.

Should the Government not adopt the recommendation of the Board, they could take a negative position—that is, obtain power to stop all sheep from crossing the River Murray for the present, and decline to interfere with the sheep. This would be right if the whole of the South-east District were diseased; but not being so, I question whether it would be an entirely equitable course.

It has been asked by owner of scrub country to the east of Policeman's Point if he could purchase the diseased sheep cheap; to place on scrub country. Although agreeing with the recommendation of the Board, such a course is open for the Government provided the sheep are placed in quarantine, to prevent their removal until late in December. Although the scrub country is dry, and sheep placed there would be off the general travelling route of sheep, I am of opinion that these sheep remaining on that country so long would leave the germs of fluke on the ground.

I have, &c.,

C. J. VALENTINE, *Chief Inspector of Sheep.*

Mr. J. M. BORROW to MESSRS. AUSTIN and COLES.

(619-74)

Crown Lands Office, Adelaide, 18 July, 1874.

GENTLEMEN,

WITH reference to the correspondence that has taken place on the subject of the flock of six thousand eight hundred (6800) sheep, diseased with fluke, now at Policeman's Point, on the Coorong, I have the honor, by direction of the Honorable the Commissioner, to inform you that, upon condition that the sheep are killed, and the carcasses burned, the Government will place a sum upon the Estimates to partly reimburse you for the loss you will sustain, such sum to be at the rate of three shillings and fourpence (3s. 4d.) per head for each sheep so destroyed—the number killed to be certified by Mr. Inspector Wells.

The cost of killing and destroying must be borne by yourselves, and the skins, &c., &c., remain your property. No claim to be made upon the Government for anything beyond the sum of 3s. 4d. per head.

I am, &c.,

J. M. BORROW, *Chief Clerk, pro Secretary.*

The Secretary, Central Board of Health, to The Chief Secretary.

Central Board of Health, Adelaide, 18 July, 1874.

SIR.

I HAVE the honor, by direction of the President of the Board of Health, to acknowledge the receipt of your communication of the 17th instant, containing the report of the Commission appointed "to examine the condition of a flock of sheep at Policeman's Point, said to be diseased with fluke, and asking that the Central Board of Health should report, as soon as possible, whether the sheep referred to are such as should be allowed to be brought to market and killed for human consumption, or whether the Board of Health would not feel justified in ordering such meat to be destroyed."

As the matter appears to be urgent, and the time required to convene a special meeting of the Board would be considerable, the President would venture to make the following suggestion:—That the sheep should be confined to a certain locality, and when the wet season is over, the pasturage should be burnt so as to destroy the ova which become attached to the moist pasturage, getting into the stomach of the sheep whilst feeding, and from the stomach passing into the liver.

The whole matter will be brought before the Board at its first meeting on Tuesday next.

I have, &c.,

R. G. THOMAS, *Secretary, C.B.H.*

The Secretary, Central Board of Health, to The Chief Secretary.

Central Board of Health, Adelaide, 22 July, 1874.

SIR,

I HAVE the honour to refer to my former communication of the 18th inst., in answer to a letter of the 17th inst., addressed to this Board, and enclosing the report of the Commission appointed "to examine the condition of a flock of sheep at Policeman's Point, said to be infected with fluke, and requesting the opinion of the Board as to whether the sheep referred to are such as should be allowed to be brought to market and killed for human consumption, or whether the Board of Health would not feel justified in ordering such meat to be destroyed."

I am directed, in answer, to forward for the information of the Honorable the Chief Secretary the following resolution of the Board of Health, passed at their meeting of the 21st inst.:—"The Board of Health have to report to the Honorable the Chief Secretary, that from the statements contained in the report of the Commissioners they cannot doubt that the sheep alluded to were not in a state to have been slaughtered for home consumption."

I have, &c.,

R. G. THOMAS, *Secretary, C.B.H.*

Mr. H. WELLS to The Chief Inspector of Sheep, Adelaide.

Wood's Wells, 8 August, 1874.

SIR,

I HAVE the honor to report that the killing and burning of the fluky sheep, which were travelling from the Woakwine country, and stopped on the country at Policeman's Point by authority of the Government, has been carried out to my entire satisfaction. The work commenced on the 23rd of July, and was finished to-day. The system and care which has characterised Mr. Robertson's proceedings in carrying out this unpleasant task, is worthy of every commendation. During the time I have been here I have endeavoured to find the fluke ova, and also small fluke. I searched the gall, bladder, bile ducts, stomach, and intestines, without success, which is probably owing to the glass I used not being powerful enough. I observed one case of rot, the liver was adhering to the side of the sheep, and when taken out had the appearance of a large hard oval-shaped lump of disease, which when opened showed a mass of decomposed matter, with a small quantity of fluke. I cannot imagine how an animal could possibly exist in such a state, and yet the sheep seemed in good condition. In every instance in searching for ova and small fluke, I found the latter all of one size, or nearly so,—fully developed.

I would call your attention to the fact, that I found the fluke in large quantities in the intestines leading immediately from the last part of the stomach; they were very numerous in the entrails, from the junction with it of the pipe or duct, down which the bile flows from the liver. I opened the entrails from this point for six or eight feet downward from the stomach, and found it full of bile and fluke. To show you how easily this parasite can leave the liver, I send by this mail a bottle containing the gall-bladder, with its pipe leading into the ducts of the liver, and from there direct into the intestines; that portion which empties itself into the entrails, though small, is so elastic, that when taken hot from the sheep would almost admit of the fingers being inserted in it. In conclusion I would beg to say, that although salt herbage may be a cure for fluky sheep, it does not alter the fact, that all clean runs, apart from salt country, are liable to become diseased if fluky sheep are allowed to travel over them.

I have certified to the number, &c., &c.

I have, &c.,

HY. E. WELLS, *Inspector of Sheep.*