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# AUSTRALIAN VETERINARY HISTORY RECORD



JANUARY 2009 – NUMBER 53

The Australian Veterinary History Record is published by Australian Veterinary History Group in the months of March, July and November.

Please take the opportunity to visit the AVHS web page  
[www.vetsci.usyd.au/avhs](http://www.vetsci.usyd.au/avhs)

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<http://ses.library.usyd.edu.au/handle/2123/222>

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II

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## **PRESIDENT'S REPORT TO MEMBERS**

Dear Members and Friends

The Australian Veterinary History SIG (AVHS) was founded in 1991 to foster interest in and to record the lives, work and achievements of veterinarians in this country. The members' newsletter, the Australian Veterinary History Record, is currently the only journal devoted to Australian veterinary history. Three issue of the newsletter are published each year.

It is the desire of the Committee that valuable insights into the development of the veterinary profession in Australia continue to be collected in the Australian Veterinary History Record, the Max Henry Memorial Library and the Bob Taylor Collection. The diligence and work of previous and current Editors and Presidents of AVHS and members in maintaining an active involvement in veterinary history is gratefully acknowledged.

There have been only two Editors of the 'Record' being Dr Peter Mylrea and Dr Ian Parsonson. Ian indicated his desire to retire from the position of Editor at the last General Meeting and the job of editing papers and nursing the development of the Record through production and postage to members. It has not been an easy job to find a replacement for Ian given the time necessary to complete the tasks and people's other commitments, even in retirement. Efforts are continuing to find an Honorary Editor. If you know of someone who would like to be Honorary Editor, please get them to contact me.

If you did not know, all previous editions of AVHS have been digitised with the kind work undertaken by the Badham Library of the University of Sydney and are available on-line at <http://ses.library.usyd.edu.au/handle/2123/222/>. Dr Trevor Faragher has updated the information on the AVHS webpage and the catalogue of the Max Henry Memorial Library can be accessed from this webpage. Thanks to Trevor for this work in bringing this webpage up to date.

This time last year I reported that the Max Henry Memorial Library (MHML) had been placed in the Gilruth Library at the Veterinary School, University of Melbourne, Parkville. This was made possible largely by the determined efforts of previous Committee members and particularly previous President, Dr Trevor Faragher. The Library has been catalogued by Dr Nicki Mock, a veterinary graduate as a trainee librarian with the University of Melbourne. Tom Hart has reported that Tammie Goates, Gilruth Librarian, and Nicki Mock have now completed digitising the contents of the MHML and this is available to members for perusal at [http://app.lms.unimelb.edu.au/bin/common/course.pl?course\\_id=78827\\_1](http://app.lms.unimelb.edu.au/bin/common/course.pl?course_id=78827_1) for the MAX HENRY MEMORIAL COLLECTION (COM 00141). If you are asked for a user name it is guest and password is also guest. A new cabinet to keep the valuable books of the MHML under security has been purchased and installed in the librarian's room at the Gilruth Library. Thanks to Tom Hart for arranging this.

Dr Tom Hart, Honorary Librarian, is anxious to increase the library and is seeking donations of books and/or money to further the MHML. A separate bank line in the AVA account in the name of the Library has been arranged into which money donations will be placed and payments made from. If you want to donate books or money please contact Tom at [tomhart@tpg.com.au](mailto:tomhart@tpg.com.au). The report on the Library in Record number 50 (page 5) by Tom represents AVHS policy on Library acquisition and a policy framework for the future development of the MHML.

I also write to invite you to the next Annual Meeting of the Australian Veterinary History Special Interest Group that is being held in Darwin on Monday 18 May 2009. A very good scientific program has been developed and it features presentations on the veterinary history of the Northern Territory and the development of specialist equine veterinary practice in Australia. As well as the scientific program and Annual Meeting there will be the Annual Dinner on

the Monday evening. The Scientific Program and Dinner venue are listed below.

Dr Jan Hills has been our contact in the Northern Territory and has assisted with the Dinner venue and is arranging a Historical Tour on the Sunday preceding the Conference. Further details will be with the Conference Agenda and will be in the next issue of the Record. Thanks to Jan for these arrangements.

I look forward to seeing you in Darwin for the Meeting and Dinner on 18 May 2009.

Andrew Turner  
President  
December 2008

**ANNUAL AND SCIENTIFIC MEETING  
AUSTRALIAN VETERINARY HISTORY SPECIAL  
INTEREST GROUP**

***Sunday 17 May 2009***

*Historical Tour of Darwin Surrounds with emphasis on Veterinary History  
Arranged by Jan Hills and National Trust NT bus tour – cost \$TBA*

***Monday 18 MAY 2009***

8.00-9.00 pm ***Dr Reg Pascoe Evolution of Specialist Equine Practice in Australia***

9.00 -9.30 am ***Dr Trevor Faragher Kendall after Kendall***

9.30 -10.00 am ***Dr Jim Whitem Anecdotes of the Sydney Veterinary School and  
Northern Territory veterinary services***

10.00-10.30 am ***Morning Tea***

10.30 -12.00 pm ***PLENARY SESSION***

12.00-1.30 pm ***Lunch***

1.30 -2.30 pm ***Hon Austin Asche, Chair Dr Jan Hills***

***Dr Chris Bunn, Forum on JA Gilruth in the Northern Territory***

***Dr John Auty***

2.30 -3.30 pm ***Dr Lorna Melville Veterinary laboratories in the Northern  
Territory past***

***Dr Peter Hooper and present***

3.30-4.00 pm ***Afternoon Tea***

4.00-5.00 pm ***Dr Brian Radunz Eradication of cattle diseases in the Northern  
Territory***

5.00-6.00 pm ***Annual Meeting of Australian Veterinary History Group***

7.30 pm ***Annual Dinner of Australian Veterinary History Group  
Moorish Restaurant 37 Knuckey Street, Darwin – fully licensed  
Six Course - Tapas Banquet menu - \$40 per person ++ drinks as  
used.***

# ARTICLE

## QUARANTINE AND DISEASE CONTROL ISSUES

AJ Turner 25 Garton Street, Princes Hill, Vic. 3054

### Introduction

A paper was presented in 2005, on lessons to be learnt from the history of the control of animal diseases focussing on diseases associated with quarantine breakdown. <sup>1</sup> To provide a span of years so that there was opportunity to review the impact of time on lessons that might have been learned, foot-and-mouth disease (FMD) in the United Kingdom was chosen as the study disease. Reviewing the events from the establishment of quarantine principles in the mid-1900s, it was concluded that frequent events do not necessarily equate to future preparedness or competency in disease control activity. Preparedness for and effectiveness of responses to quarantine breakdown are functions of the resources available and the time elapsed after an event allows the lessons learned dim from previous experiences. There was no better example than in the use of vaccination to control FMD recommended as a control measure in the UK 75 years before the 2001 outbreak and despite the use of uncontrolled mass slaughter for FMD being seen as unsustainable in continental Europe long before 2001.

The 2005 paper outlined the four pillars of quarantine and disease control developed by Gamgee <sup>1</sup>

- slaughter of infected animals,
- restrictions on the movement of susceptible animals with isolation/quarantine of animals in contact with infected animals,
- disinfection of infected premises and
- payment of compensation to owners of slaughtered animals.

Since the 1860's, testing of animals for evidence of current infection (antigen) or previous infection (antibody) and the use of vaccination to limit or prevent infection spread have been added as further pillars of disease control.

This paper explores what has occurred since the 2001 outbreak of FMD in the UK. Since 2003, a number of quarantine breakdowns have initiated subsequent disease control programs that are interesting in that they have involved countries seen to be very capable of operating quarantine boundaries. The

quarantine breakdowns, disease outbreaks and subsequent disease programs outlined in this paper are the occurrence of post weaning multi-systemic wasting disease (PMWS) in pigs in New Zealand in 2003, highly pathogenic avian influenza (HPAI) in turkeys in the UK in 2007, foot and mouth disease (FMD) in cattle in the UK in 2007 and equine influenza (EI) in horses in Australia and Japan in 2007.

## Reference

<sup>1</sup> Turner AJ 2007. Lessons from history – control of animal diseases. *Aust Vet Hist Rec.* **50**:6-17.

## PMWS in New Zealand in 2003

The suspicion of the occurrence of PMWS in NZ was announced in ProMED in October 2003. <sup>2</sup> The disease was characterised by a low incidence of disease in affected herds with a high mortality in the pigs falling ill (10% in the initially reported herd). It was noted that PMWS was an emerging complex disease being diagnosed with increasing frequency in Canada, USA, Europe and Asia, and that confirming PMWS might take some time.

On 4 May 2004, again in ProMED, NZ confirmed that 25 piggeries had been provisionally diagnosed with a serious pig disease in the North Island. <sup>3</sup> The NZ Ministry of Agriculture and Forestry (MAF) advised the Pork Industry Board that it was not inclined to slaughter out affected herds because it did not consider it technically feasible to eradicate the disease given the number of affected herds with disease surveillance still to be undertaken. The Pork Industry Board disagreed with the MAF decision and pressed for a national management strategy to deal with the disease.

In April 2004, it was speculated that the outbreak was caused by either a PCV-2 virus already widespread in NZ pigs or by an unidentified infectious agent or a virulent PCV-2 virus recently introduced into NZ. In June 2005, the NZ Pork Industry Board announced that the program to stamp out PMWS was progressing and was expected to be completed in 2006. <sup>4</sup> In 2006, the control program was called off reportedly because the disease was seen to be widespread on the South Island where the keeping of free range pigs is more extensive than on the North Island. The first official scientific report on the PMWS outbreak was published in late 2007 and postulated that seagulls by mechanical means might have been associated with the spread of the disease in the South Island. <sup>5</sup> This report also noted that swill feeding was occurring in the area of the affected piggeries but concluded that swill feeding farms had

insufficient records to allow analysis of whether or not they had had PMWS. No association was shown with artificial insemination.

Enquiries to NZ colleagues in late 2007 established that no enquiry was undertaken into whether PMWS might have entered NZ through imported pig meat. Biosecurity NZ believes that PMWS was caused by an indigenous agent (PCV-2) and that a slaughter out response would not eradicate the disease. The Pork Industry Board believed otherwise and for this reason set about control of the disease in 2003. Since writing the above, Professor Roger Morris has informed the author that he continues to maintain that an agent additional to PCV-2 was involved in initiating the clinical signs. A paper is in preparation seeking to demonstrate this by an infection experiment and conclusions drawn from studies on pig herds with PCV-2 and a high health status. Apparently the North Island outbreak was under control with the last apparently infected farm identified when the South Island outbreaks started. Surveillance two years earlier had demonstrated no evidence of PMWS on the South Island. However, the South Island outbreak commenced as a multi-farm outbreak and further attempts to control PMWS were abandoned. It is understood that Professor Morris has concluded that the South Island outbreak was different based on clinical signs and observable epidemiology so suggesting an independent origin. It was pointed out that NZ allowed the importation of fresh pig meat between October 1998 and September 2001 (Roger Morris personal communication May 2008).

In 2007, Biosecurity NZ reviewed the import conditions for pork. The review focussed only on the possibility of porcine reproductive and respiratory syndrome being imported and did not address the risk of introduction of any other agents.<sup>6</sup>

NZ MAF veterinary officers have maintained over the years that it would be impractical to have a total ban on swill feeding in NZ because it would not be enforceable. It was believed that rather than a ban on swill feeding it could be regulated by overseeing approved premises and cooking procedures that would treat infectious agents in the swill. Anyway the quarantine border would not be penetrated by imports from an illegal, potentially dangerous, source. This philosophy has allowed anyone to feed swill to pigs until 2005 and it was estimated that there were 200 commercial and 12 000 to 20 000 non-commercial pig herds in NZ that were presumably feeding food scraps from households and food industry sources. In 2005, all food waste was supposed to

be fed to pigs only after boiling at 100<sup>0</sup>C for one hour. However, this was not being observed by the small piggeries in the South Island at the time of the outbreak of 2006. Banning swill feeding is seen as difficult because it is a long-standing practice and difficult to enforce. This would seem to be defeatist as supervising adequate cooking of swill at 12 to 20 000 pig herds would be seen by Australia as a very difficult exercise and far more difficult than enforcing a ban.

It remains an enigma why a ban on swill feeding has not been promulgated in either the UK or NZ given the potential for FMD virus, other vesicular diseases and many pig diseases to be spread by feeding food waste to pigs from human sources. Swill feeding operations were invariably poorly managed and operated in Australia before the ban on swill feeding was instituted in 1977. The UK has still not instituted a ban on swill feeding despite the cost of the FMD outbreak in 2001 and a decline in the use of the resource over the years. The importation of pork and the practice of allowing swill feeding have been shown over the years to be a pathway for the entry, establishment and spread of infectious swine diseases. Pigs, pig semen and fresh pork imports were allowed in the 1990's and a new agent or new strain of an agent could have been introduced and allowed to spread among pig herds before surfacing as PMWS observable in many piggeries.

The question remains open how PMWS came to occur in NZ. Presumably there were suddenly cases of higher mortality and poor performance in well-run pig herds in the North Island of NZ - although this has not been made clear in published reports and in what can be elucidated by request for information. Interestingly, Professor Morris has concluded that infection of the initial infected pig herd established in 1999. Where PMWS has appeared, it was seen to spread to herds across a country. This was seen in Canada, US and Europe where herd morbidity of 40% and herd mortality of 20% was recorded initially in some herds but declined over time to 4-30% and 4-20% respectively.<sup>7</sup> It is not clear from published reports in PMWS in NZ whether there was an acute episode of herd morbidity and mortality prior to the reporting of one herd with 4-10% mortality or whether 'a disease' syndrome was spreading or had spread previously across the North Island. What occurred in NZ is hard to assess because so little information has been made available on what occurred and the response. The fact that there has been no official review of the 2003 to 2006 events is not a healthy standard practice on which to build an efficient and effective animal health service.

Sweden reported PMWS for the first time in 2003 with higher initial morbidity and mortality rates than were recorded in NZ.<sup>8</sup> Interestingly, phylogenetic analysis of PCV-2 isolates from a number of countries demonstrated that the NZ virus of 2006 is closely related to viruses in China (2002), UK (2000) and France (1999).<sup>5</sup> This article was written with an undertone that both outbreaks, i.e. on the North Island and later on the South Island, had an acute onset in index case herds suggesting that a newly introduced or recently mutated causative agent was responsible. This conclusion raises the issue of the phylogeny of the North Island PCV-2 virus, which was not discussed in the paper.

The lessons to be learnt from the occurrence of PMWS in New Zealand are:

- it cannot be assumed that a disease condition arose from an endemic agent without examining all available evidence from a thorough investigation of the events surrounding an unexpected disease outbreak;
- there is no evidence that NZ has conducted a review of the occurrence of PMWS and information about the outbreak was not forthcoming from official sources following requests;
- the available data indicates that there were index herds to the outbreaks on both the North and South Islands that were some years apart;
- this sequence of events can only be explained reasonably by an infectious agent being associated with the point source of the two outbreaks; and
- the point source for an infectious agent might have been from importation of an agent into the country or by mutation from an agent in the country, if PCV-2 was the cause of the outbreak as claimed by New Zealand.

The issues raised in this examination, from the limited material available, leaves a need to explain:

- why a New Zealand agent, if PCV-2 virus was the cause of the outbreak, arose with very close phylogenetic relationship to viruses in France, UK and China;
- the probability of a point source mutation arising in the small NZ pig population;
- why an exotic agent imported, legally or illegally in pig meat, did not initiate the outbreak when worldwide evidence continues to mount that

trade in pigs and pig meat spreads infectious porcine diseases between countries; and

- why permissive swill feeding was not seen as increasing the likelihood of disease transmission to the South Island and be a means for other exotic agents to gain entry to NZ.

## References

- <sup>2</sup> ProMED-mail. Multisystemic wasting syndrome, swine – New Zealand suspected. ProMED-mail 2003; 2 October 20031002.2480. <http://promedmail.org>. Accessed 23 December 2007.
- <sup>3</sup> ProMED-mail. Post-weaning multisystemic wasting syndrome, swine New Zealand. ProMED-mail 2004; 3 April 2004. 20040504.1229. <http://promedmail.org>. Accessed 23 December 2007.
- <sup>4</sup> ProMED-mail. Post-weaning multisystemic wasting syndrome, swine New Zealand. ProMED-mail 2005; 25 June 2005. 20050626.1790. <http://promedmail.org>. Accessed 23 December 2007.
- <sup>5</sup> Neumann EJ, SS Dobbinson, EB Welch & RS Morris 2007. Descriptive summary of an outbreak of post-weaning multisystemic wasting syndrome (PMWS) in New Zealand. *NZ Vet J* **55**:346-352.
- <sup>6</sup> NZ MAF Biosecurity 2007. Additional Background Information. Draft import health standards for pig meat and pig meat products, based on import risk analysis on porcine reproductive and respiratory syndrome virus (PRRS) in pig meat. Dated 12 November 2007.
- <sup>7</sup> Segales J, GM Allan & M Domingo 2006. Porcine circovirus diseases. In *Diseases of Swine*. Ed BE Straw, JJ Zimmerman, S D'Allaire & DJ Taylor 9<sup>th</sup> Edn pp 299-307. Blackwell Publishing.
- <sup>8</sup> Wallgren P, F Hasslung, G Bergstrom et al 2004. Postweaning multisystemic wasting syndrome – PMWS, the first year with the disease in Sweden. *Vet Q* **26**:170-187.

## HPAI in UK 2007

HPAI has spread across a significant proportion of the world since 2003 when the continuing epidemic of H5N1 HPAI commenced in South East Asia. Trade in poultry and poultry products and wild birds and the movements of wild birds, particularly Anseriform birds, has seen the disease spread throughout Asia into Africa and periodically into Europe. Most of the reports of the European outbreaks concern wild birds, particularly swans although outbreaks have occurred in domestic poultry establishments.

The outbreak in turkeys that commenced in England in January to February 2007 differed from previous reports because wild bird deaths were not recorded in the area about the processing plant and growing farm in Suffolk. The outbreak was reported on 1 February 2007 in one of 22 sheds of grower turkeys with about 1000 birds dead and 80-90% of birds in that shed showing illness.<sup>9</sup> The affected shed was in a poor state of maintenance with holes in the woodwork close to the ground and not covered with mesh and a roof that

leaked. Seagulls were noticed to ‘loaf’ on the rooves of the processing plant and the farm sheds. Small wild birds, rats or mice could enter the building and water contaminated with faeces could have had access through the roof. The biosecurity and maintenance of the other sheds was of a much higher standard and biosecurity practices at the growing farm were reported as of a high standard.<sup>10</sup> Overall DEFRA considered biosecurity between the processing plant and the farm good.

The interesting aspect of this outbreak was that turkey breast products were received at the Suffolk processing plant from a processing plant owned and operated by the same company in Hungary. Hungary reported two outbreaks of H5N1 AI on goose farms in Hungary with infection probably starting between 14 and 16 January. Although there is usually little waste from the products transferred to the UK, 60 kg of waste was generated from breast meat received on 15 January at the Suffolk plant. The Hungarian plant was closed between 13 and 20 January for its annual maintenance with no breast meat being sent to the UK during this period.<sup>10</sup>

Genetic analysis of the viruses isolated from the UK turkey flock and the Hungarian geese flocks demonstrated the isolates were almost 100% homologous but only 95% homologous to isolates from wild birds from Hungary and Scotland in 2006. Some six hypotheses were developed to explain the origin of the virus infecting the UK turkey flock. The epidemiological team considered that there was evidence that either refuted the hypotheses or showed them to be very unlikely or implausible.<sup>10</sup>

The DEFRA report concluded that H5N1 HPAI infection from wild birds probably initiated infection on the two geese farms and one turkey farm in Hungary. The assumption is that meat from Hungarian-raised turkeys, sub-clinically infected with the goose virus, was imported into the UK. The supposition would be perhaps the turkey flock became infected a short while before slaughter out of the unit and clinical disease eventuated. The infected turkey meat and scraps in the UK processing plant were presumably transferred to the turkeys in the infected Suffolk flock by wild birds or rodents as the affected turkeys were in the house with poor maintenance and open to the ingress of faecal contamination by birds and to entry of rodents. The epidemiology group recognised that ‘the benefits of adjacent location of commercial poultry and production and processing plants, in terms of protecting welfare and limiting environmental impact by reducing travelling

time, need to be weighed against the increased risk of disease transmission, particularly where imported products are handled.’<sup>10</sup>

This epidemiology report was seen as biased toward blaming wild birds for initiating these HPAI outbreaks in UK and Hungary. It is hard to explain why direct spread by poultry or poultry products or indirect spread through fomites and human intervention are not seen as a major or a significant means of spread of AI between poultry premises worldwide. Many places claiming exposure to migratory bird pathways are also on routes for legal and illicit trade in poultry and poultry products. The fact that the virus was homologous from three farms (and presumably a fourth turkey farm in Hungary) forced investigators to consider spread by trade in poultry products. How the same virus would be excreted by one wild bird over multiple sites is difficult to comprehend. Without detailed genetic analysis of the Hungarian and UK viruses, one suspects that wild birds would have remained the focus for initiating the outbreak.

The fact that the UK authorities undertook in-depth epidemiological investigations and published detailed reviews and reports soon after the commencement of the outbreak is commendable and demonstrated a transparency that other animal health authorities in other countries should examine and emulate.

The lessons to be learnt from this disease occurrence were:

- UK authorities readily published reviews and reports after commencement of the outbreak (this was commendable comparable with NZ and Japanese authorities who may wish to examine such actions);
- UK authorities were forced to recognise that infected geese and turkeys in Hungary were the probable source of the outbreak despite no infected turkey flock in Hungary being identified;
  - this forced abandonment of the wild bird source theory;
- the international trade in poultry and poultry products are as important, if not more important, in the spread of avian influenza as wild birds;
  - wild birds serve as an easy target that everyone wants to blame;
- the co-location of a growing unit for turkeys with a processing plant that also handled imported turkey meat product poses an incredible risk for challenging biosecurity procedures;

- it is to be hoped that this would not be allowed in Australia but, given recent equine influenza revelations, disallowance would be no certainty;
- Biosecurity is only as effective as the poorest performance of maintenance and implementation of biosecurity procedures.

## References

<sup>9</sup>. ProMED-mail. Avian influenza (24): UK (England), turkeys H5. ProMED-mail 2007; 2 February 2007. 20070202.0424. <http://promedmail.org>. Accessed 7 February 2008.

<sup>10</sup>. Outbreak of highly pathogenic H5N1 avian influenza in Suffolk in January 2007. A report of the epidemiological findings by the national emergency epidemiology group, DEFRA 5 April 2007.

## FMD in UK in 2007

The outbreak of FMD in the UK in 2001 was devastating with more than 4 million animals killed to control and eradicate the disease. The recurrence of the disease in Surrey announced on 3 August 2007 shocked disease watchers and undoubtedly shocked UK authorities.<sup>11</sup> The virus causing the outbreak was established as the 1967 Oswestry strain used by Merial to produce vaccines and by the Animal Research Institute in diagnostic reagents at their respective Pirbright laboratories in Surrey. Proximity to the laboratory complex led to the conclusion that the virus had originated from one or other of the laboratories. With no ready explanation as to how the virus emerged to infect cattle, such as a virus plume or tracing to a particular fomite movement, there was inevitably consideration of the potential for activist or terrorist action.

Infection was detected early and, following the slaughter of infected, at risk and suspect herds, the outbreak was thought to have been brought to a halt after three infected premises were recorded. A total of eight infected occurred between 3 August and 1 October 2007. Many infected premises were recorded long periods of 34 and more days after the initial infected herds had been depopulated and disinfected. These lingering infections were in small herds and animals on these farms had old FMD lesions, and the source of infection was attributed to an infected herd that was not reported. Infection was mostly in beef cattle but sheep were infected on one of the last infected premises detected. Infection in one herd was detected 16 km away from the nearest infected premises. This was achieved presumably by fomite transmission.<sup>12</sup>

Without a ready explanation for the source of the outbreak, investigations of increasing thoroughness were undertaken as to how virus could escape from the Pirbright complex. DEFRA ordered two investigations into the circumstances that led to the escape of virus from the Pirbright site. The Health and Safety Executive (DSE) reported on potential breaches of security<sup>13</sup> and Professor Brian Spratt of Imperial College reported on the safety of UK facilities handling FMD virus.<sup>14</sup> Both investigators focussed on the old, poorly maintained and defective effluent system shared by both the Institute for Animal Health (IAH) and the Merial laboratories. DSE concluded that such was the state of the site drainage system that the requirements for Containment at Level 4 were not met. An investigation about ownership of the drainage system revealed there was a dispute between the parties about whose responsibility it was for maintaining integrity of that section that was subject to long-term damage and leakage, including cracked pipes, unsealed manholes and ingress of tree roots.

The UK Government has to be commended for providing the World Reference Laboratory for FMD, supporting ongoing research into FMD and allowing ongoing manufacture of FMD vaccines. The UK Government accepted and acted on the reports when it could have walked away from FMD research and vaccine manufacture with its associated hazards. DEFRA was advised to treat the construction on the Pirbright site as though a potential biosecurity hazard existed, with restrictions being placed on the areas where leaks were occurring from the drainage system. Both investigation teams concluded that movements of people and vehicles at the Pirbright site were not adequately controlled. The investigators recommended that the biosecurity measures and procedures at the Pirbright and other sites subject to the animal pathogen controls be reviewed. Interestingly, DEFRA has required sterilisation of all waste in the high containment areas before discharge to plumbing systems external to the operating areas.

IAH was expected to carry out a more far-reaching review than that carried out by Professor Spratt.<sup>15</sup> The conclusion arrived at was that the virus was taken out inadvertently in soil that had been overturned during maintenance on the drainage system from the Merial vaccine manufacturing plant. The investigations revealed that vaccine virus was spilling into the waste drainage system and that the waste from the plant was not treated until it reached a treatment plant well away from both laboratories. Virus contaminated soil inside the quarantine compound must have been carried out on a vehicle,

plumbing tools or clothing associated with the maintenance work. It must have been a tense time for staff, who until this plausible explanation was uncovered, were under some suspicion of deliberately releasing the virus.

These events provide some significant lessons about quarantine breakdown. In 2007, the Pirbright site and animal and laboratory accommodation is inadequate and new buildings are planned to be provided in the future. With contaminated soil as the likely means for removal of FMD virus from the Pirbright site, it would appear that the quarantine procedures for preventive action broke down in the decontamination procedures for the movements of people, vehicles and equipment from the site. Given what is instituted on the movement of vehicles onto infected premises and around roads in a FMD infected area, it is almost unbelievable that vehicles entering and leaving such premises were not treated as potentially contaminated given live virus could be in the drainage system. This lapse may reflect that those responsible for the overall biosecurity at the Pirbright site had limited understanding and presumably limited experience with measures needed to control FMD.

The scene for disaster was set with large quantities of virus being able to exit a building without primary treatment before leaving that building. Secondary treatment in a facility distant from the vaccine manufacturing plant was being relied upon to deal with infectious virus. There is no record in the reports seen by the author that a thorough review had been undertaken of biosecurity arrangements at Pirbright between the major epidemic of FMD in 2001 and the commencement of the outbreak in 2007. The lesson is that, when dealing with sites that produce large amounts of politically significant agents, no stone should be left unturned to ensure that an infectious agent is treated as soon as practicable after leaving the site where such agents are manufactured or processed. Strict quarantine procedures need to apply to all people movements, even those undertaking maintenance duties outside the premises of manufacture, as apply to people working in the areas of premises where infectious virus are researched and manufactured.

Although Pirbright has been associated with containment breakdowns in the past, it seems that complacency had set in because FMD had not spread from the Pirbright site for many years. Interestingly, it was when the premises had so deteriorated and was in need of renewal and upgrading of infrastructure that the unexpected occurred. Major reconstruction of the animal containment facilities at Pirbright were scheduled to commence in 2012. The observation that the site

occupants could not agree on whose responsibility it was to deal with the leaking drainage was an indication that all was not well with biosecurity at the site. This was probably a reflection of financial restrictions, although this was not admitted by DEFRA. Although not mentioned, perhaps a time of financial restrictions and decaying infrastructure is a time to become nervous about biosecurity, a time to be more vigilant and to consider all eventualities. Deteriorating premises are not inspirational in maintaining the highest standards of biosecurity and staff motivation. Veterinary history is that poorly run and run-down animal farms are those that pose the highest risk in disease outbreaks and the same is likely to apply to laboratories and manufacturing plants handling infectious agents.

The lessons to be learned about this outbreak of FMD were

- biosecurity has to be worked on continually if breakdowns are not to occur;
- live virus should never have been allowed to leave a building where huge quantities are being produced for vaccine production;
- the maintenance contractors working on the disposal systems should never have been allowed to enter and leave the premises without total disinfection as for an infected livestock premises;
- the occupants of the Pirbright site should never have been allowed to get into a situation where responsibility for infection control could be compromised;
- priority for maintenance at places like Pirbright should never be allowed to slip despite a rebuilding program being due in about 5 years as older premises require more maintenance;
- finding all infected premises with small numbers of resident animals pose special problems of detection for disease control agencies;
  - a failure to report disease in such small flocks and herds makes it more important that surveillance procedures are instituted that will detect infection in such flocks and herds.

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### **Equine Influenza (EI) in Japan in 2007**

Japan issued a request for information on 20 August 2007 on ProMED about EI after closing down all racing and movement of horses on 17 August on account that EI had been diagnosed in 20 horses.<sup>16, 17</sup> The outbreak disrupted horses going to race in Europe and Australia. OIE records showed that EI was last reported from Japan in 1972 although vaccination was routinely applied. Japan originally reported to OIE on 28 August 2007 that 14 August was the start date of the outbreak, with confirmation being on 17 August 2007, and stated that it was the recurrence of a listed disease.<sup>17</sup> The start date was subsequently amended to 12 August in a follow up report to OIE. The circumstances surrounding the Japanese outbreak have not been documented sufficiently to allow any public or scientific scrutiny to be undertaken.

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### **Equine Influenza in Australia in 2007**

Australia also reported the first occurrence of equine influenza to OIE on the same day that Japan notified its outbreak to OIE.<sup>18</sup> The timing of the two outbreaks immediately raised suspicion on the Australian outbreak originating from horses imported from Japan, because the Eastern Creek Quarantine Station in Sydney contained horses from Ireland, Japan, UK and US. There were also horses from Japan and US in the Spotswood Quarantine Station, in Melbourne.

EI had not been recorded in Australia before 2007. Undoubtedly this situation was assisted by horses travelling to Australia by sea passage before the advent of air transport and quarantine requirements. Following the imposition of quarantine requirements to prevent EI being introduced by horses travelling by air, the risk management measures included isolation, vaccination and testing in the country of origin as well as in post-arrival quarantine in Australia. Quarantine procedures to prevent EI entering a country are not difficult if reasonable and sensible principles of separation from clinical disease, inspection and hygiene are practised. These procedures apparently failed in Australia in 2007.

The importation of shuttle stallions into Eastern Creek Quarantine Station and Spotswood Quarantine Station was followed by the detection of stallions apparently clinically infected with equine influenza in the Eastern Creek Quarantine Station. This was rapidly followed by the detection of infected horses across New South Wales and Queensland. The occurrence caused such uproar in the horse industry following the cancellation of all racing in Australia for 7 days subsequent bans on the interstate and intrastate movement of horses that a Committee of Inquiry was established under Commissioner the Honourable Ian Callinan. The Commissioner was tasked by the then Government to determine the circumstances that contributed to the outbreak and to advise on the need for any strengthened biosecurity procedures for quarantine management of imported horses.<sup>19</sup> Unfortunately the report was not released at the time of writing this paper although handed to the relevant Minister.

At the opening of the Inquiry, Counsel Assisting the Commissioner detailed a sequence of events by which it was assumed EI virus might have entered Australia focussing on the six importations of stallions into Eastern Creek Quarantine Station between 3 and 8 August 2007. The Inquiry recorded that 8 stallions were from US, 44 were from UK and Ireland and 4 were from Japan. On arrival and within the quarantine and customs boundary at Sydney International Airport, there were persons accompanying the horses on the aircraft and receiving officers of the Australian Quarantine and Inspection Service (AQIS). In addition, a variety of people, including a film crew, were present whose presence was neither necessary nor required. The Inquiry was told that most people attending the arrival at Sydney Airport were not wearing adequate protective clothing.<sup>19</sup>

Also during the opening day of the Inquiry, Counsel Assisting the Commissioner outlined three possible scenarios as to how the outbreak may have originated. The first scenario was that virus was introduced with one or more of the imported horses that led to infection of Australian horses by indirect contact during transfer from aeroplanes to trucks at the airport before travel to post-arrival quarantine. The second scenario was that infection was transferred to Australian horses from infection developing in the Eastern Creek Quarantine Station and then transferred out of the Station by the same indirect means, being movements of contaminated humans or equipment. A third scenario considered was that infected horses in Eastern Creek Quarantine Station led to direct airborne transmission to Australian horses. The third scenario was considered unlikely because of the weather conditions at the time. Other scenarios discounted were that a person with contaminated clothes might have brought back infection following overseas travel and that the virus was present in the Quarantine Station from a previous consignment of horses and this led to infection in the horses arriving 3 to 8 August.<sup>19</sup> It was an interesting circumstance that the likely sequences of events were being established and some discounted before evidence was heard from witnesses but this did not hinder counsel representing various interests from attempting to raise alternative scenarios about the likely source of infection.

In the Eastern Creek Quarantine Station, clinical signs likely to be EI were first observed in one stallion on 17 August 2007. However, testing of this index case for influenza was not conducted until 20 August 2007 by which time respiratory signs were seen in two other horses. Positive results for EI were confirmed on 23 August.<sup>20</sup>

The evidence to the Inquiry, of the quarantine procedures followed at the Eastern Creek Quarantine Station, was indicative of *ad hoc* arrangements for the implementation of import protocols with an incomplete written manual of procedures and a lack of appropriate training of people for their roles. Indeed people listed as managers, of the animal import program in NSW, were shown to have had no understanding of or formal training in animal diseases and quarantine procedures necessary to prevent the escape of EI from a post-arrival quarantine station. Regrettably some of these included veterinarians both within and outside AQIS. From the evidence, the overseas arrangements for the pre-export quarantine for the horses also appeared to be *ad hoc*. The stallion in the Eastern Creek Quarantine Station that first developed clinical signs of equine influenza was from Ireland and it had no detectable antibody to the vaccine

virus supposedly administered to the horse less than six months and many other times before entry into pre-export quarantine. Suspicion was expressed at the Inquiry whether some horses had undertaken proper pre-export quarantine procedures and had been vaccinated against equine influenza as required by the importation protocols.

Interestingly while the horses were in post-arrival quarantine, Japan reported an outbreak of EI which in vaccinated horses may have started some time prior to the export of the horses to Australia. In August 2007, EI, caused by a mutant strain, was resurgent in horse populations in Europe, North America and the northern hemisphere generally. The significance of the emergence of this new strain by mutation was that currently available vaccines, incorporating field strains no longer prevalent, did not provide good protection from infection with the mutant strain. The situation was such that Australia should have been on higher alert for EI in imported horses and acted immediately on any suspicion of abnormal respiratory signs in any horse in post-arrival quarantine. When such signs occurred at Eastern Creek Quarantine Station it took several days before testing got performed. In retrospect, horses in the Spotswood Quarantine Station developed antibody to EI indicating infection but post-arrival quarantine procedures prevented virus release.

The spread of EI into the Australian horse population has provided disease control agencies with a foretaste of what to expect if another highly infectious and contagious disease such as FMD was to gain entry into Australia. Although it was unfortunate that the experience was supplied at the expense of the horse industry, it was fortunate that the experience did not require the slaughter and disposal of infected animals as would have been necessary for a disease such as FMD. Once it was realised that EI was outside the Eastern Creek Quarantine Station, AUSVETPLAN was put into operation. Unfortunately by that time, the disease was across central/northern NSW and into Southern Qld. It was a real test of discipline in the horse industry as to whether the diverse major and minor industry players would obey a national standstill order. Apart from some incidents, the horse industry did comply with the standstill order which is greatly to the credit of all its participants as there have been suppositions over many years that it would not be possible to achieve an effective standstill in the horse industry.

The release of EI from a quarantine station should be very easy to prevent. While the prime responsibility for its release rests with the AQIS Animal

Quarantine Program, the horse industry was not blameless in its activities associated with the import of horses. The horse industry should have known and demanded better. The ingress of industry people that has occurred inside the customs and quarantine barrier at airports after arrival of horse imports needs to be stopped. There should only be those people who absolutely need to be there as it is not a photography opportunity for marketers who should obtain their marketing material before the horses enter quarantine in the exporting country. Quarantine measures need to be applied rigorously in the quarantine area at the airport to all persons entering and leaving the airport to handle or access imported horses.

During post-arrival quarantine at the quarantine station, quarantine measures also need to be applied to all persons entering and leaving the facility. There should be no ifs or buts, with a 48-hour quarantine period of no contact with horses applied to all people leaving the quarantine station. There is a need for discipline to be applied to all associated with the quarantine procedures operated by AQIS and management was dysfunctional. Clearly from the record of the Inquiry, proper quarantine procedures had not been operating at the Eastern Creek Quarantine Station in recent years. However, while some AQIS employees were incompetent or just lax, industry personnel, including veterinarians, who should have known better were also incompetent or lax in carrying out biosecurity measures at the airport and quarantine station from either or both of which the EI infection emerged. Veterinarians have a responsibility to the industries that they serve to ensure the highest biosecurity and infection control procedures operate in relation to their professional activities.

Why was it so, as Professor Julius Sumner Millar would ask in the past tense? How could quarantine procedures become so badly administered? This question raises a number of important perspectives needing consideration that lead into the lessons to be learned.

1. There is no evidence that AQIS or the Department of Agriculture, Fisheries and Forestry has carried out detailed investigations into the circumstances surrounding the events that led to the occurrence of EI in Australia and whether the procedures in other quarantine programs were being carried out effectively. The sequence of the events about the outbreak has been gleaned from indirect reports posted in ProMED and in papers and evidence to the Callinan Inquiry. A rigorous investigation at the time the

events unfolded would have been useful in enabling an examination of areas where other quarantine programs were deficient and corrective action being initiated. Third parties were left to try and piece together the events in explaining the epidemiology of the outbreak some time after the event.

2. The evidence to the Inquiry would make you wonder why tourists entering and residents returning to Australia and their luggage are subjected to such rigorous quarantine procedures at airports when the procedures in place at Sydney's International Airport and at the Eastern Creek Quarantine Station for imported horses and associated personnel were deficient and nearly non-existent. There is no rational reason to elevate passengers and their luggage to a higher category of risk of introducing disease than animals being imported from endemically infected countries. There is a need to get risk-based perspective and rationality back into the operation of quarantine in Australia.
3. Why was the veterinary expertise in AQIS outlined in the Inquiry so unable to ensure a professional quarantine program for importing horses in Sydney when it did not fail in Melbourne? Why were there no veterinarians in positions within AQIS where it might be expected from their job title that they would be? Why did some industry veterinarians and persons apparently have such a poor understanding of the transmission of infectious diseases and of their responsibility to maintain a quarantine program to protect the Australian horse industry and the health status of the livestock industries generally. In AQIS, managers who by their title might have been expected to know about animal diseases, their means of transmission and how to prevent transmission apparently had no knowledge, training or expertise in quarantine or the need for risk management measures. Why would not veterinarians be employed in positions needing knowledge of disease transmission and measures to prevent such transmission? This situation is not good enough to protect Australia's livestock industries.
4. Why did some veterinarians, who of all university graduates would be expected to have a thorough training in the transmission of infectious diseases and their control, exhibit poor knowledge or a lack of knowledge of such matters? Why was this knowledge so poor in many giving evidence to the Equine Influenza Inquiry given the national focus placed on this subject over the past 13 years since the commencement of the WTO arrangements? The establishment of the WTO required that Australia and

other WTO member countries no longer apply trade restrictions arbitrarily to prevent a possible disease importation but to undertake a scientific risk assessment and apply only those risk management procedures needed to meet its appropriate level of protection. It could be assumed that the lack of understanding of disease transmission and veterinary responsibility in the profession could stem from a lack of effective teaching in the universities and ongoing continuing veterinary education. A national approach is needed to develop and provide the programs that will address the understanding of infectious diseases and their control to all sectors of the veterinary profession. All Australian veterinary schools need to assess their course material to ensure that they produce veterinary graduates with an adequate understanding of the fundamental principles of disease transmission, disease control procedures and their responsibility for Australia's animal health status. Focussing the retraining programs and their importance through veterinary registration bodies (as used to disseminate information about the requirements for the control of use of veterinary chemicals) and the Australian Veterinary Association adopting biosecurity responsibilities into its Code of Ethics would help to ensure the necessary information was disseminated and enforced by disease control agencies.

5. Although the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) has the opportunity and obligation to institute effective and timely training for its quarantine staff and ensure positions requiring a knowledge of animal diseases and their transmission have qualified people retained in those positions, the challenge will be to change the focus from fashionable managerial training as a means of promotion in the public service. Rebalancing the focus on to technical competence and expertise will be more difficult to achieve. Technical competence needs to be considered as of at least if not of more importance than knowledge of the latest program management practices and procedures if operational effectiveness and efficiency in animal quarantine is to be attained. Without a culture of promoting veterinary excellence in disease control practices in the public service, there will be no solution to the current dismal situation. For too long there has been a 'dumbing down' of the technical expertise of veterinarians and veterinary expertise in the Australian public services at Commonwealth, State and Territory levels. Managerial program requirements must not be allowed to over-shadow veterinary competence which has been the situation over the past 30 years accentuated since the

demise of the Australian Bureau of Animal Health (ABAH) and the Commonwealth's resumption of the quarantine function shared with the States and Territories 1901 to 1995. The Commonwealth maintains the Australian Bureau of Agricultural and Resource Economics and the Bureau of Rural Sciences in DAFF but it eliminated the animal health resource (ABAH) diluting and splitting it among four different groups being AQIS, Biosecurity Australia, International Division and Product Integrity and Animal and Plant Health Division.

The Equine Influenza Inquiry has provided the stimulus to re-establish the ABAH or such other structure in the Commonwealth Public Service with a focus on quarantine and disease control that is able to review overseas disease situations and provide independent advice to Australian Governments particularly on the efficiency and effectiveness of operational quarantine and disease control. While the Equine Influenza Inquiry has focussed on the divisions between AQIS and BA, the separate veterinary expertise in the Office of the CVO in the Product Integrity and Animal Plant Health Division and the International Division of DAFF also needs consideration. Separation of groups needing access to the same expertise will inevitably lead to gaps in knowledge and breakdowns in procedures. Establishing a centralised resource, such as the now defunct Australian Bureau of Animal Health can help overcome the division and diminution of veterinary expertise in all three arms of veterinary service in AQIS, Office of CVO and Biosecurity Australia. Current arrangements dilute expertise and diminish cohesion and leadership in animal health matters. Division and separation assists confusion and laxity. AQIS has demonstrated a very poor record in understanding risk assessment of disease entry to Australia with breaches of quarantine procedures. The sending of babesiosis infected cattle to New Caledonia in contravention of New Caledonia's import requirements and allowing the import of beef from Brazil is symptomatic of a service that cannot cope with its requirements. Australia needs to marshal all its veterinary expertise and forces if it is to maintain effective quarantine borders and 'Australia's enviable animal health status and export record.' An independent body such as a Bureau with overarching responsibility and staffed with veterinarians and scientists with suitable expertise would provide operational overview across all animal health activities and also assist Animal Health Australia (and, if it included plant health functions, Plant Health Australia) to focus on making timely decisions based on technical and scientific information rather than on

process that at present results in indecision due to seemingly endless discussions and consultations.

6. A contributor to the decline in veterinary expertise in the quarantine program was the resumption by the Commonwealth of the shared quarantine function between the States, Territory and Commonwealth Governments commencing in 1995. The quarantine function had operated from 1901 as a shared function to the benefit of the Australian livestock industries. The resumption has removed from the Commonwealth an operational disease control perspective, which in retrospect, it could not afford to lose. The lack of first hand animal disease control activity in the Commonwealth is a disincentive for ongoing training in and understanding of disease procedures and quarantine. The Equine Influenza Inquiry has provided the stimulus to re-establish a national forum where there is, in reality, a combined responsibility between the Commonwealth, States and Territories on quarantine and disease control functions that are so interminably entwined. The forum should be provided with information about overseas disease situations and deliver independent expert advice to DAFF, particularly on the efficiency and effectiveness of the operational arms of quarantine and disease control.
7. The EI outbreak has exposed seriously deficient reporting by the Commonwealth to Animal Health Australia on its performance standards in the quarantine function. Whoever carried out the audit was not honest in the assessment of quarantine effectiveness and the State and Territory Governments and the Australian horse industry have been left to pay part costs in eradicating EI. Animal Health Australia should initiate an independent review of the way the Commonwealth carries out audits of its quarantine performance and oversight the annual audit of quarantine performance until satisfactory auditing standards are established. The author having been associated with establishing the performance standards did not believe that the auditing systems would deliver honest assessments of the actual situations in government or industries. It is time for Animal Health Australia to re-examine the self-appraisal auditing process. A review needs to be undertaken into whether self-assessment auditing will deliver meaningful assessment of performance standards of biosecurity in the livestock industries. Australia needs prevention not correction of faults in its biosecurity arrangements.

8. The establishment of yet another review under Roger Beale has thrown open the whole quarantine program to scrutiny and examination. This review has to be seen as a smoke screen to focus the attention of key industries away from the Commonwealth's failures to administer an effective quarantine service and the need to undertake 'a root and branch' review of how veterinary issues should be administered in the Commonwealth.

In summary, the lessons to be learned from the EI outbreak disaster are as follows:

- AQIS has operated a warped perception of quarantine risk assessment and implementation of risk management procedures that need urgent correction;
- no review of the outbreak and contributing factors has either been undertaken or made publicly available which is a significant deficiency in developing remedies;
  - AQIS and DAFF could emulate DEFRA in the UK in proactively undertaking reviews as outbreaks unfold;
- AQIS needs to get back veterinary expertise into those positions within its service that require knowledge of infectious disease transmission and disease control procedures;
- there is a need to ensure all veterinarians are conversant with disease transmission mechanisms, disease control procedures and professional responsibilities for maintaining Australia's favourable animal health status through
  - better and re-invigorated training in veterinary schools; and
  - veterinary registration board activities and guidelines and the Australian Veterinary Association adopting biosecurity guidelines into its Code of Ethics;
- the Commonwealth Government needs to marshal its fragmentary veterinary services into a single body that can be a centre of excellence and independent advice in veterinary science that can oversight all matters associated with veterinary science;
- the Commonwealth Government reinstitutes links with the States and Territories that makes delivery of the quarantine function a shared responsibility in reality not theory;
- Animal Health Australia and DAFF need to examine how the auditing of the performance standards in the quarantine service was so badly

- wrong and implement systems for all Animal Health Australia members that will achieve genuine recording of performance;
- a thorough audit needs to be carried out on all quarantine programs to ensure that there are not other programs with deficiencies;
  - the auditing process will identify areas of the program where there are deficiencies in the program or procedures; and
- Animal Health Australia should examine whether self-assessment auditing is the appropriate manner to assess performance standards of biosecurity in the livestock industries and associated government agencies;
    - Australia needs prevention in its biosecurity program arrangements not correction.

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## Conclusions

Quarantine breakdowns still occur despite the technology available for the detection of disease agents to prevent their movement across quarantine barriers. The liberalisation of trade in animals and animal products under the SPS Agreement of the WTO will likely lead to further dissemination of animal diseases unless adequate quarantine principles are applied. The fundamental reasons for the breakdowns examined in this paper lie in the improper attention to and application of known procedures to prevent the transmission of diseases in trade between countries and from high security premises exemplified in the following.

NZ MAF should not have allowed fresh pig meat to be imported if it believed that PCV-2 was the cause of PMWS, particularly while allowing commercial swill feeding without the application of risk management reduction measures.

UK DEFRA should not have allowed the importation of fresh turkey meat to a slaughter and processing plant where live turkeys were being raised in proximity at the same site despite claims that separation was taking place; DEFRA either did not have systems in place or audit that biosecurity measures

were being rigorously applied at the Pirbright facility manufacturing large amounts of FMD virus.

Japan MAF appeared to operate quarantine for equine influenza casually because vaccination was practised internally while no account was taken that a mutant strain, present overseas, was able to overcome the immunity provided by many vaccines.

Australian AQIS did not ensure that there was effective operation of pre-export and post-arrival quarantine procedures at one quarantine station to prevent equine influenza escaping to Australia's horse population; the service was not on high alert given the occurrence of a mutant strain in exporting countries able to overcome the immunity given by many vaccines.

The studies in this paper demonstrate that effective remedies for quarantine breaches are likely to come from a thorough investigation into the breaches that are established soon after their detection and undertaken by the authority responsible for it. UK DEFRA is to be applauded for its ready institution of investigatory teams and external reviews that are made publicly available during the period of investigation. Authorities in NZ, Japan and Australia have given no evidence that an investigation or review has been or is being undertaken into their PMWS or equine influenza outbreaks, a situation that is to be regretted. If lessons are to be learnt, the reasons for quarantine breakdown need to be established as soon as practicable by the responsible authority. Regrettably, AQIS has not published/carried out a thorough investigation of the circumstances surrounding the quarantine breach at the Sydney Eastern Creek Quarantine Station and it has been left to others to hypothesise an explanation in the Callinan Inquiry months after the event. Attempting to establish facts in such an adversarial legal setting is a poor replacement for a timely thorough veterinary investigation. The failure to release the Callinan Inquiry Report more than one month after submission to the Minister is equally regrettable.

The operation of Australia's quarantine barrier and the standing of the veterinary profession have not come out well from the evidence presented to the Callinan Inquiry. AQIS needs, in the words of the Prime Minister 'a root and branch revision' with competent and qualified people put in charge of quarantine functions including managerial positions in AQIS and other veterinary branches; these positions should not be used as ladders and stepping stones for the public service generally. In addition, the Commonwealth's

veterinary expertise needs to be aggregated into a single body after years of disaggregation. The veterinary profession overall needs to act with responsibility to the livestock industries in ensuring effective quarantine and biosecurity measures operate for the benefit of the livestock industries generally and particularly where there is interaction with quarantine duties. This needs to be reinforced by veterinary registration authorities requiring veterinary responsibility for effective quarantine and biosecurity measures and the AVA adopting such responsibilities into its Code of Ethics. Finally, the failure of the Commonwealth's auditing processes in reporting annually on the Performance Standards of the quarantine function to Animal Health Australia needs review about the value and veracity of in-house auditing by its Members. External review of processes and procedures will better prepare Australia from the threats of internal and external disease outbreaks.

At the end of May 2008 and nine months after the event, it is feared that critical lessons will not be learnt from Australia's embarrassing quarantine breach under the guise of legal liability and indemnity claims, further reviews by the Commonwealth obfuscating the situation and the public service not allowing technical merit to assume key selection criteria for managerial roles in AQIS and other senior areas of veterinary administration. Time will tell.

Overall, Australia will revisit this place unless fundamental changes are made to the way quarantine processes are operated and people are employed in positions requiring veterinary expertise and knowledge. The shared responsibility for quarantine services between the Commonwealth and the States 1901 to 1995 provided the optimal delivery method for the quarantine service because it was grounded in organisations that carried out disease control procedures.

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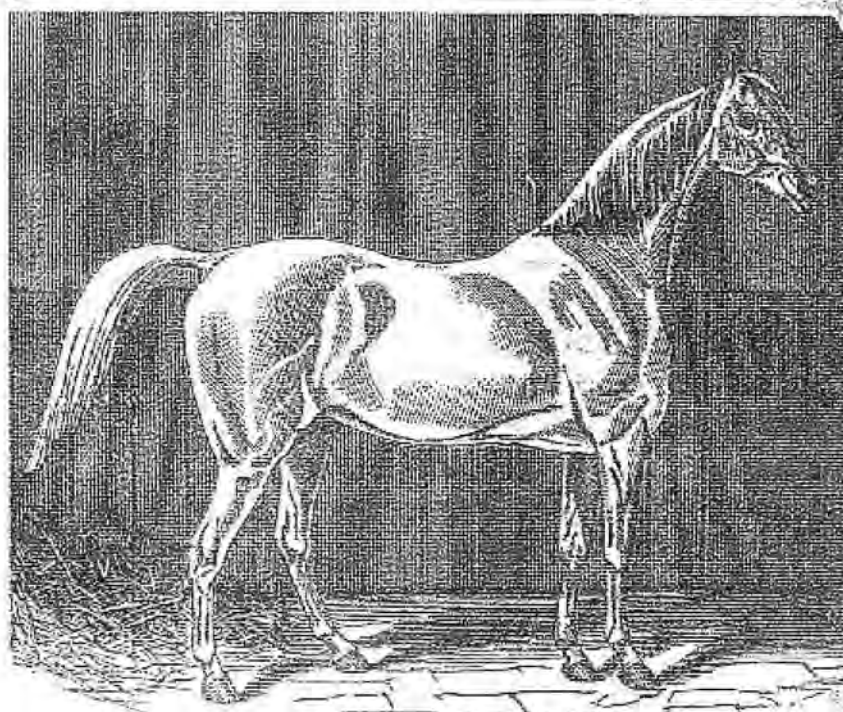
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