Plus ça change . . .
From rinderpest to bovine spongiform encephalopathy

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ABSTRACT — Cattle plague (rinderpest) caused serious loss of cattle in Europe up to the beginning of the 20th century. Effective control measures were developed in the 18th century by Lancisi in Italy and Vicq d’Azyr in France long before the viral nature of the disease was understood. Similar measures are used to control BSE, which unlike rinderpest, also infects man. Much can be learned from earlier work on such problems as failure to notify outbreaks, inadequate application or deliberate evasion of control measures, and the value of compensation. Still renowned as a comparative anatomist, Vicq d’Azyr not only practised comparative medicine but as permanent secretary of the Société Royale de Médecine in Paris (1776–1793) developed a national scheme for collecting public health data. His views on how doctors face an unknown disease and on the problems of administration could have been written today.

Now and Then

'It found the attitude of those with primary responsibility for implementation, namely the farming industry and slaughterhouse owners and operators, astonishing' (Sir Kenneth Calman in evidence to the BSE Inquiry, 12 October 1998)

Felix Vicq d’Azyr, the French anatomist, physician and expert on cattle diseases, would not have been in the least astonished.1,2,3 Knowledge of infectious disease has increased enormously in the last 250 years, but it is arguable that our position in relation to bovine spongiform encephalopathy (BSE) and new variant Creutzfeld-Jakob disease (nvCJD) differs little from that of his in relation to the cattle plagues that caused serious losses in France at the end of the 18th century. Vicq d’Azyr had the advantage that his cattle plague, now known to be the viral infection rinderpest, does not infect people. BSE does, and the prions supposedly causing it are quite different from viruses. Nevertheless, in cattle, the methods of controlling the two diseases are the same: isolation and slaughter. To a surprising extent, so are the resulting administrative, social and political problems.

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advising on epizootics. When in 1775 Turgot, the enlightened minister of Louis XVI, asked the Académie des Sciences for two experts, one medical, the other scientific, to see what could be done about a disastrous outbreak of cattle plague in the south of France, he was advised that he needed only one: Vicq d’Azyr. The appointment was highly successful, although it is remarkable that a doctor, only two years qualified, busy with practising medicine, teaching anatomy and doing important research in comparative anatomy, should also have found the time, and the interest, to become an expert advisor on the control of epizootics.

Precursors

Vicq d’Azyr was active, intelligent and well connected, but he also owed much to his predecessors. Cattle plague was mentioned in an Egyptian papyrus of 3000 BC and may have been one of the biblical plagues. It had certainly been present in Europe since Roman times, accompanying armies who depended on cattle for transport as well as food. There were outbreaks in France and elsewhere in the 18th century well before that of 1775. One of the most instructive was in the Papal States in 1711 where 30,000 cattle died in a period of three to six months; it was eventually controlled by the physician to Pope Clement VII, Lancisi, whose views and detailed rules on a policy of isolation and slaughter were obviously the foundation of those published by Vicq d’Azyr. Lancisi managed to get his policies adopted by the College of Cardinals in spite of their intrinsic preference for prayers for divine intervention, even if these were not being answered.

Views and principles

Though techniques have changed over the years the underlying principles remain much the same, as do some of the difficulties. Many of Vicq d’Azyr’s general views are valid today though some may make uncomfortable reading. At a time when many fevers were poorly differentiated he stressed that, while there were different plagues, manifestations of a specific plague in animals could differ from those produced in man, and he gave some elementary explanations: for example, the thick skin of cattle made the development and diagnosis of eruptions difficult; in treatment, the multiple stomachs of cattle contraindicated the use of emetics, but the same disinfectants could be used for both animals and man.

There were parallels and differences between epidemics and epizootics. In both, new diseases caused special problems or as Vicq d’Azyr put it, ‘Doctors consulted in an epidemic of a serious disease, often little known or understood, may not furnish much help until their initial uncertainty is resolved by experience; and they cannot help their earlier patients as much as their later ones.’ Recent striking and moving examples of this can be seen in the statements by relatives of victims of nCVJD to the BSE inquiry. Cattle can be viewed less emotionally and Vicq d’Azyr described the technical situation clearly. ‘Epizootics show similar problems. Initially, sick beasts are often noticed by unenlightened people who assume the illness is due to an ordinary cause which can easily be eradicated. Deaths are regarded as local losses of no interest to the rest of the country.’ A century later, in the 1865 outbreak of cattle plague in England, this last point was no longer true. Railways had reduced rural isolation and big towns depended on farmers for their meat.

Other comments suggest that Vicq d’Azyr had suffered from 18th-century bureaucracy. ‘Some administrators treat, with the same negligence, an illness that at the start gives no hint of disaster, but whose rapid progress soon threatens agriculture with imminent ruin.’ Ruin then meant less the loss of exports than the threat of famine and starvation and the loss of draught oxen. Nor were doctors spared: ‘The ministers of health, [ministers’ here seems to refer to local doctors in the same sense as ministers’ of religion refers to clergymen] little accustomed to such things, or looking on themselves as above this sphere of activity, are reluctant to get involved: so in the end farriers and blacksmiths or primitive peasants are charged with this important duty of care. Meanwhile the contagion spreads from one case to the next and the area infected becomes so great that one dare not then hope to completely destroy its [the infection’s] traces. The mention of farriers sounds unduly dismissive since in France at that time they were organised in guilds and served an apprenticeship which included veterinary medicine. They resented the intrusion of students from the veterinary schools of Lyons and Alfort, recently founded to raise the unsatisfactory level of veterinary studies. Both groups, however, were primarily interested in horses, not cattle, probably for financial reasons.

Practical measures: compensation or coercion

Although Vicq d’Azyr did not give a strict case definition, as would be required by current epidemiological practice, he did give a detailed list of diagnostic signs and defined what needed to be done once an outbreak was established. To deal with an outbreak he wanted either a student from the veterinary school, an experienced farrier, or, if he would take the trouble, a country surgeon. He wanted a sufficient number of troops as enforcers, and peasants to do the physical work. The troops were preferably in three groups: the first formed a cordon round the whole area affected; the second entered the area to ensure that the necessary procedures were carried out; and the third remained in the principal villages to deal with subsequent infections. Infantry were preferred for the first two, cavalry for the last – presumably because they could supervise a larger area. The troops started at several points on the circumference and moved inward. Speed was important if the operations were to be effective. Where infection was diagnosed, some peasants were ordered to kill the animals and others to prepare pits for the carcasses. Both slaughter and burial were to be done well away from roads, drinking troughs, straw dumps and other animals. Burial had to be deep, at
least 10 feet (sic) (the metric system was only established in 1793) in marked sites.

Ideas of rinderpest as an infection developed considerably in the 18th century and were clearly accepted by Vicq d'Azyr. Healthy and affected animals were to be separated by removing the healthy animals from the stables, which were then cleaned and 'purified'. Purification involved a variety of chemicals from vinegar to burning sulphur. 'Mild' explosives were sometimes used: for purification not destruction. This was no doubt impressive but what it did is not clear. Not surprisingly, Vicq d'Azyr's policy of slaughter and separation, rather than (ineffectual) attempts at cure, was criticised at the time although it would be approved now. Moreau cites someone in Geneva who thought (familiar phrase) the proposals were 'impracticable in the country'. Vicq d'Azyr understood that to establish the value of a treatment strict comparisons of similar groups were essential. He also knew the practical difficulties and realised that you could not force farmers to do things in which they did not believe, in place of proven useless practices in which they did. Given the chance, peasants would hide and sell off sick animals rather than slaughter them, hence the need to visit all farms. Vicq d'Azyr believed that secret disposals could be avoided by paying adequate compensation. This was possible thanks to grants from Louis XVI. Other regimes have been more draconian: under Charlemagne, people failing to declare the infection in their cattle were killed by drowning, possibly reduced to perpetual forced labour if there were extenuating circumstances; failure to notify under Frederick William I of Prussia in 1716 could result in flogging, followed by hanging. He had not learnt from his Hanoverian contemporary George I of England who, advised by his physician Thomas Bates, in 1714 paid an indemnity of between five and 40 shillings, depending on the age of the animal. This is alleged to have helped control this particular English epidemic in five months.

La Société Royale de Médecine

Louis XVI's government was interested in human as well as cattle disease, and in 1776 Turgot set up a Commission for Epidemics with Vicq d'Azyr as Commissioner-General. This rapidly became the Société Royale de Médecine, confirmed by royal letters-patent in 1778. Vicq d'Azyr was its permanent secretary. The government already collected information on epidemics from its provincial representatives, the intendants. The new organisation now acquired additional information from provincial doctors and others. The type of information needed - epidemiological, clinical, and meteorological - was defined in great detail by Vicq d'Azyr, who also strongly recommended the use of barometers, rain gauges, and environmental thermometers. Clinical thermometers only came into use in the 19th century, although one was described by Sanctorius in the 17th. The Société Royale de Médecine also kept an eye on the use and value of mineral and medicinal waters.

Initially, all correspondence had to go via the govern-

Cattle plague in 19th century Britain

The 1865-66 outbreak is particularly interesting, as it falls roughly halfway between that of 1775 in France and the BSE outbreak of 1984 onwards, mostly in Britain. Although rinderpest had continued in Europe throughout the 19th century, Britain was partly protected, as an island and by a ban on imported cattle. The ban was lifted in 1842: rigid controls in eastern Europe had kept cattle plague from the west and the national memory of the disasters had faded. The danger from infected imported cattle was foreseen by John Gamgee in 1857 and again in a report to the Privy Council in 1862 where he urged reforms of the cattle trade with proper inspections and initial quarantine of imported cattle. However, various attempts at legislation failed. In two letters to The Times in November 1863, Gamgee pointed out that steam had replaced war as a means of spread and that the next outbreak would come from Russia (Siberian cattle plague). It did:
in June 1865, in cattle coming via the Baltic and landing at Hull. The first sick animals were detected in London but the disease spread rapidly throughout the country.

The Royal Commission of 1865

In the absence of adequate central powers of enforcement, the Privy Council's protective measures – standstill orders, slaughter and isolation – were applied only piecemeal by local authorities and often opposed by local interests. Initially the controls had little support from a largely anti-contagionist public, while farmers and traders ignored them where they could. Efforts at treatment failed as always, but increased the risks of spread. The main advocate of the established methods of control, isolation and slaughter, was Gamgee, but as a veterinarian he was looked down on by physicians, and as a supporter of contagion he was attacked in The Times by clerics who believed in spontaneous generation. However, by December 1865 The Lancet, which supported Gamgee, could report that at last there was some sense in The Times. But much time had been lost. A Royal Commission under Earl Spencer recommended, among other things, wide standstill orders and improved slaughter-houses. A minority report by Viscount Cranborne, Dr Bence Jones and others agreed that total stoppage was the most effective control measure, but objected to it as it would interfere with trade. The Commission also recommended more and better qualified inspectors, and tried to reduce interference by local interests on whom they depended for their livelihood. Similar problems with supervision and certification in 1990 led the Ministry of Agriculture, Fisheries and Food (MAFF) to propose a National Meat Hygiene Service, though it was not inaugurated until 1995. The new inspectors were no more popular than their predecessors and their trade union complained that meat inspectors were being harassed at work.

In spite of tighter controls the number of known cases was soon doubling every four months. In an unconscious echo of the Cardinals of 1711, the Queen's speech to parliament in February 1866 asked for divine blessing on the means being employed. However by June 1866 numbers were falling, as predicted by William Farr from his new epidemic curves. Many cases were missed. The Privy Council estimated that 30% of returns needed correcting while 10% were unusable. The Board of Trade confessed to an entire absence of information on the number of cattle in England but said they would try to get some voluntary returns. The Lancet reported losses over two and a half years as some 250,000 cattle or 5% of the national stock; Cheshire lost 52%. In contrast, in 1993, eight years into the outbreak, MAFF announced the 100,000th case of BSE. Even five years later this had only risen to about 173,000 (MAFF helpline). But by 1 March 1999 there had been 39 human deaths from vCJD.

In 1865–66 compensation was paid at 2/3 value of a sick beast and 3/4 that of a healthy one. It was of course regarded as inadequate though the Royal Commission thought it was being paid for almost any disease. Attempts at an insurance fund paid for by farmers never stood a chance and compensation was paid out of the rates. Currently there are the same arguments but compensation, at 50%, later 100%, is paid from central funds although the permanent secretary of MAFF suggested, without much hope, that the industry might pay at least part.

.... plus c'est la même chose

Vicq d'Azyr was living in the age of enlightenment and public health was much in fashion. Gamgee was active in the aftermath of Chadwick's, and the heyday of Sir John Simon's, public health reforms. Today we use their solutions, albeit modified, but still have difficulties, as Vicq d'Azyr put it, 'when dealing with a contagion of uncertain origin and mode of spread in an economically valuable resource, and with the potential for foot dragging or obstruction by those whose interests are affected.' After Vicq d'Azyr's epizootic, the Société Royale de Médecine was founded. After 1865-66 there were improvements in the veterinary service of the Privy Council. Gamgee wanted a minister for agriculture but that only came later. After BSE, what? The inquiry goes on.

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The founders of dermatology: Robert Willan and Thomas Bateman

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Robert Willan (1757–1812) (Fig 1) has been chosen as dermatologist of the millennium\(^1\) for his achievement in being the first person to 'arrange diseases of the skin in a clear and intelligible manner, and to fix their nomenclature on a satisfactory and classical basis'.\(^2\) In doing this he was following the precedent set by Carolus Linnaeus (1707–1778), who had classified plants and the animal kingdom, and William Cullen (1710–1790), who had extended this classification to human disease. In this article we describe some important material, including dermatological drawings relating to Willan's work, which is held in the College Library.

Willan has been described as 'the individual who first brought order into what had been a clinical subject of extraordinary confusion and uncertainty...\(^3\)'. Born and educated in the Sedbergh area of Yorkshire, he undertook his medical training in Edinburgh. Coming from a family of Quakers, he did not attend the Anglican Universities of Oxford or Cambridge and therefore was not eligible to progress beyond the status of Licentiate within the College.

After Edinburgh, Willan moved to London, on to Darlington and then returned to London, where he was appointed physician to the newly established Public Dispensary in Carey Street. (Some of the Dispensary's records from this period have been deposited with the Library.) Willan presented his classification of skin diseases to the Medical Society of London in 1795 and five years later the Society awarded him the prestigious Fothergillian Medal for his work. Willan's classification was made up of eight 'orders' and in 1798 he started to publish each of these under the title *Description and treatment of cutaneous diseases*. Only four parts had been published by the time of his death, the orders *papulae*, *squamae*, *exanthemata* and *bullae*. These were reissued in 1808 as the first volume of his book *On cutaneous diseases*.

One of Willan's students at Carey Street was Thomas Bateman LRCP (1778–1821), who succeeded him as the Dispensary's physician. After Willan became seriously ill and left London for Madeira in 1811, Bateman was recognised as the leading expert on skin diseases.

In 1813, Bateman published *A practical synopsis of cutaneous diseases according to the arrangement of Dr*