10. Pollution control and waste management

Introduction

10.1 Two measures introduced to control BSE – the compulsory slaughter scheme for infected cattle in 1988, and the animal SBO ban in 1990 – had the unwelcome side-effect of producing a large amount of condemned materials requiring special disposal arrangements. The problems this presented were to absorb a great deal of time and effort from MAFF.

10.2 A system already existed for disposing of waste deemed to present dangers to human and animal health. The normal permissible way of disposing of diseased animal carcasses was by incineration or by burial, either on farm or at licensed sites. This chapter reviews that system and how it coped with the additional quantities of cattle carcasses and other tissues that resulted from the BSE measures. As each new measure was considered, its likely impacts on waste disposal problems and costs were factors to be considered.

10.3 The need for safety guidance for those handling BSE-infected carcasses at tips was raised by local authorities early on in the story. We discuss how that was dealt with by MAFF and the Health and Safety Executive (HSE) in Chapter 8 of this volume.

10.4 The prospect that rising numbers of condemned carcasses might require special guidance to farmers and local authorities as well as provision of equipment and new tips, was also recognised early on. The first and obvious priority was to ensure that the animals that died or were killed on a farm were disposed of swiftly and safely before they rotted. MAFF were the official owners of animals killed under the slaughter and compensation schemes and had to make arrangements for safe disposal of these within the statutory rules. So far as other condemned material was concerned, oversight and enforcement of safe disposal mainly lay with the local authorities and statutory agencies. However, MAFF needed to give advice and encouragement to these bodies over disposal, and to work closely with them to ensure arrangements were appropriate and effective.

10.5 A special problem with BSE was the dearth of knowledge about whether the infective agent could be degraded or inactivated by processes such as quick-liming or copious dilution, and how long it would remain a risk in buried material. For carcasses, therefore, burning was the favoured option, but as BSE cases multiplied demand outstripped available incinerator capacity. Open pyre burning could handle only a fraction of the balance, not least because it soon attracted a considerable public outcry. At a later stage, doubts were raised that this might broadcast the agent far and wide. Burial on farm or at landfill sites therefore remained the only available option until enough incinerator capacity was gradually built up. Planning permission for new incinerators was again in many cases hotly contested.
10.6 Nor was the burial option for such large quantities of material universally popular. There were concerns that disposal on farmers’ land or in local authority landfill sites might lead to leaching of the BSE agent into the ground and into water supplies. Some local authorities as time passed refused to accept BSE material on their sites.

10.7 Unlike condemned carcasses, specified bovine offal (SBO) from slaughterhouses and knacker’s yards was not allowed to be buried in a raw state. Instead it first had to be ‘sterilised’, which included processing at rendering mills. The resulting meat and bone meal (MBM) and tallow could then be disposed of by burial on approved landfill sites, if not used for other purposes. As the chapter shows, problems arose over the extent to which the products of rendered SBO were truly ‘controlled waste’ or might lawfully be used in other ways.

10.8 All these matters, as we shall see, raised considerable passions and had economic repercussions for the disposal of waste animal material generally. Moreover, over the period, new regulatory regimes were being progressively brought in as the water and sewage authorities were reorganised, inspectorates amalgamated, responsibilities shifted away from local authorities, and new standards set for incinerators and emissions under the Environmental Protection Act 1990.

10.9 These new arrangements and regulations were not, however, specifically directed at the nature and inactivation of the BSE agent in burnt or buried material. They were general measures, designed to deal with general environmental and pollution issues. Nor were they concerned with the efficacy of the systems of control over water and condensate discharges from slaughterhouses, knacker’s yards and rendering plants in relation to BSE. We note in this chapter some of the questions raised later about discharges from one such rendering plant, Thruxted Mill. Although much of the evidence relates to a time outside the period of this inquiry, we thought some aspects illustrated some of the difficulties that arise in dealing with secondary wastes when there are uncertainties about the nature of the hazard and several different authorities are involved.

10.10 The chapter also looks briefly at the consideration given to possible BSE transmission risks through the spreading on land of another slaughterhouse product, raw blood. This was left unresolved.

10.11 We have not attempted to review wastes arising from other parts of the meat production cycle, such as slurry and manure from housed animals. So far as we are aware, no work, apart from consideration of calf faeces for veterinary preparations, was carried out before March 1996 to assess whether these offered possible pathways of the BSE agent.

10.12 After tracing the course of events we discuss the adequacy of the response and the lessons to be learned from the BSE story.
Slaughter and disposal options for diseased animals

10.13 First, however, we describe the system in existence when BSE emerged, for dealing with diseased animal carcasses. Animals affected, or suspected of being affected, by a notifiable disease which had to be slaughtered could not be sent to a slaughterhouse in the normal way. Instead, they had to be killed and their carcasses disposed of in accordance with the Animal Health Act. This was usually carried out on the farm under veterinary supervision. Disposal was usually by burial or incineration.

10.14 Nor could fallen stock, dead or dying, normally be sent to a slaughterhouse. Such animals were sometimes buried on the farm. However, before the advent of the BSE epidemic by far the most common means of disposing of these was to call in a knacker or hunt kennel. As discussed in vol. 13: Industry, Processes and Controls, knackers would come on to the farm to collect fallen stock, destroy diseased or injured animals and remove their carcasses, or collect such animals for slaughter on their own premises. They usually paid the farmer a small sum, as they could convert the carcass into saleable products such as hides and pet food. Hunt kennels would also collect carcasses to feed their hounds. Both knackers and hunt kennels were left with a considerable amount of waste that they were unable to use and this was disposed of to renderers.

10.15 The Slaughterhouses Act 1974 required that any animal slaughtered in a knacker’s yard be stunned and slaughtered in the same way as it would have been in a slaughterhouse. However, it did not regulate the killing of an animal outside knacker’s yards or slaughterhouses (for instance, on a farm or in a hunt kennel). While the Act required knackers to be licensed by the local authority as ‘offensive trades’, it did not require the same of hunt kennels. None the less, some hunt kennels took in more fallen stock than they needed to feed their hounds, with the aim of selling the meat for pet food and MAFF treated these as if they were knacker’s yards.

10.16 BSE became a notifiable disease when the Bovine Spongiform Encephalopathy Order 1988 came into force on 21 June 1988. In August that year a scheme was introduced for the compulsory slaughter of animals showing clinical signs of BSE. If a veterinary inspector diagnosed an animal as being affected by BSE it had to be slaughtered, either on the farm or at a place specified by the veterinary inspector. The carcass then had to be ‘buried, or sold, or otherwise disposed of’ by the Government. It could not be collected for use by a knacker or hunt kennel. In practice, the options available to the Government for disposal were incineration, or burial either in a local authority landfill site or on-farm.

Controls over incineration and burial of BSE carcasses

10.17 A number of regulations bore on each of these disposal methods, in order to control their environmental, and in some cases public and animal health, impacts.

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3775 L1 tab 3C, Slaughterhouse (Hygiene) Regulations 1977, where exceptions for veterinary certification are set out
3776 S137 Rudman para. 18
3777 L17 tab 2 section 36
3778 YB91/06.00/7.8
3779 L2 tab 1
3780 L2 tab 1A
3781 L1 tab 1, Animal Health Act 1981 section 34(2)
Further details on these regulations are given in vol. 14: *Responsibilities for Human and Animal Health*.

**10.18** The incineration of animal carcasses, and of other controlled waste from commercial or industrial premises, had to be carried out in accordance with a valid waste disposal licence issued by the waste disposal authority under the Control of Pollution Act 1974. Regulations controlling emissions from incineraors changed between 1986 and 1996. These changes were not as a consequence of BSE:

i. Between 1985 and 1991, new incineraors burning any solid matter at a rate of 45.4 kg an hour or more required approval from the relevant local authority to ensure that suitable equipment was installed to arrest grit and dust emissions.\(^{3782}\) The height of chimneys serving furnaces of this size also required approval by the local authority.\(^{3783}\)

ii. Between 1989 and 1991, incineraors capable of incinerating 1 tonne or more of waste per hour also required approval by Her Majesty’s Inspector of Pollution (HMIP) to ensure the use of the Best Practicable Means to prevent or render harmless emissions of noxious or offensive substances.\(^{3784}\)

iii. Since 1991 animal carcass incineraors have been controlled in one of two ways. *Those with an incineration capacity of 1 tonne per hour or more* were regulated first by HMIP and then by its successor body, the Environment Agency (EA), under the Integrated Pollution Control (IPC) system established by Part 1 of the Environment Protection Act 1990. The 1990 Act sought to prevent, minimise and render harmless specified emissions to air, water or land. *All other incineraors* with capacities of under 1 tonne per hour are regulated by local authorities in respect of air pollution. Some small incineraors continued to be exempt from local authority control, including those burning animal remains where the capacity is under 50 kg an hour.\(^{3785}\)

**10.19** Planning permission from the local authority is required for any waste-management facility requiring a licence. Some facilities, such as certain on-farm incineraors, as discussed above, do not need a licence and therefore do not need planning permission either. Further, in respect of licensed facilities, a consent has to be obtained from the relevant pollution control authority for emissions or discharges to air (and water) before planning permission can be applied for.\(^{3786}\)

**10.20** Open burning (on a bonfire, pyre or in a pit) of livestock carcasses on farm, where the animals concerned had died, or had been compulsorily slaughtered as a result of notifiable disease, was exempt from regulatory control under provisions in the Clean Air (Emission of Dark Smoke) (Exemption) Regulations 1969. This meant that the restrictions applying to larger incineraors did not affect such fires. However, two conditions were attached to this exemption: that there was no other reasonably safe and practicable method of disposal, and that the burning would be supervised. If the burning was carried out by or on behalf of a MAFF inspector, the conditions did not apply.

\(^{3782}\) Under the Clean Air Acts 1956 and 1968 (consolidated in the Clean Air Act 1993)

\(^{3783}\) DO01 tab 13 p. 3

\(^{3784}\) DO01 tab 13 p. 3

\(^{3785}\) DO01 tab 13 p. 4

\(^{3786}\) DO01 tab 13 p. 12
10.21 Open burning is now covered by the Environmental Protection Act 1990.

10.22 Landfill sites required a licence issued by the waste disposal authority, usually the local authority. Planning permission was required before a licence application could be determined. The waste disposal licence set out the conditions under which the landfill site could operate and in many cases limited the nature of the material the site could accept. These provisions in the 1974 Control of Pollution Act applied at the time BSE emerged. Although there have been further regulatory developments since then, including the 1975 EC Framework Directive on Waste and the Environment Protection Act 1990, the basic licensing requirement for landfill sites has been retained.

10.23 The main restriction on burial on farm was the Dogs Act 1906, under which it was an offence to leave a carcass exposed so that dogs could gain access. Furthermore, under the Control of Pollution Act 1974 Part I, enforceable by local authorities, it was normally an offence to apply any waste onto land that was likely to damage the environment. Since 1990 burial on farm has been controlled by local authorities under Part II of the Environmental Protection Act 1990. If carcasses were buried (or not buried as the case may be) in a way that was a danger to a watercourse there were penalties for pollution under the Water Act 1973 enforced by the regional water authorities.

**Impact of BSE on disposal practices for other fallen stock**

10.24 BSE undoubtedly had a knock-on effect on the disposal of animals that were dying on farm for reasons other than BSE, ie, fallen stock. Some problems that arose in the early 1990s as a result, including dumping of carcasses on roadsides and in rivers, are described in vol. 12: *Livestock Farming*. We do not consider this wider topic of disposal of non-BSE carcasses here, but briefly summarise the main points in relation to BSE measures.

10.25 The introduction of the SBO ban in November 1989 and the voluntary ban by the UK Agricultural Supply Trade Association (UKASTA) on the use of MBM derived from SBO in animal feed reduced the value of animal wastes from knackers. While most of the raw material used to produce MBM came from slaughterhouses, some came from knacker’s yards. Renderers and animal feed manufacturers were not confident that knacker material would be free of SBO. This meant that renderers had little market for MBM containing SBO, or knacker’s products, mainly because few animal feed manufacturers were willing to use them. Combined with a slump in the world price of tallow and MBM this led renderers by early 1990 to stop buying knackery waste for processing and instead they began charging knackers and hunt kennels for collecting it. At that time, the collection charges were not high, but the combination of the loss of revenue and the imposition of new costs, combined with a drop in the prices received by knackers for hides and meat, forced most knackers to start charging farmers for the removal of fallen stock. Struggling farmers were often unwilling or unable to pay these charges and some sought alternative means of disposal.

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3787 This was the position in mid-1986, but the Water Act 1989 established the National Rivers Authority which enforced water pollution legislation following the privatisation of the water authorities in England and Wales.

3788 M43A tab 15 p. 27. Memorandum by the Licensed Animal Slaughterers and Salvage Association to the Agriculture Committee of the House of Commons; M43A tab 15 p. 23. Mr Harrison, Chairman of UKRA in evidence to the Agriculture Committee.

3789 M43A tab 15 p. 27.
Disposal of SBO-derived material via renderers

10.26 As mentioned in vol. 13: *Industry Processes and Controls*, processing in slaughterhouses was by far the most important way in which cattle were slaughtered and converted into saleable products (including human food) in the UK. Knackeries also converted a significant number of carcasses into saleable products such as pet food and hides. Between them, every year, these industries produced a vast quantity of by-products: in the order of 1,500,000 tonnes of red meat by-products alone, of which 80 per cent originated in slaughterhouses.3790

10.27 Slaughterhouse and knackery by-products, such as bone, fat and inedible offal, were sold to renderers, who could process them through heat and compression into tallow (the fatty component) and greaves (the remaining solid), which was further formed into MBM.

10.28 The human and animal SBO bans and the later amending legislation regulated who could process SBO and what had to be done with it after it was processed. Under the human SBO ban, SBO could be used for any purpose other than human food, so slaughterhouses could send it to renderers and other manufacturers for processing. The SBO could not be removed from the renderer’s premises until it had been ‘sterilised’ (ie, rendered). The 1989 Order did not restrict what could be done with it once it had been rendered, so renderers were able to sell tallow and MBM derived from SBO to manufacturers of products other than human food, such as the animal feed compounders for non-ruminant use. However, in practice, many animal feed manufacturers insisted that SBO-free material be used when manufacturing MBM for use in their products after the 1989 Order came into effect.

10.29 The animal SBO ban came into effect in September 1990 and extended the ban on the use of SBO in any animal feed.3791 This meant that a new way had to be found to dispose of MBM derived from SBO.

10.30 In November 1991 a further order came into force which, among other things, prohibited the movement of MBM derived from SBO except under the authority of a licence issued by an Agriculture Department official.3792 This new requirement sought to ensure that SBO-derived MBM was incinerated or sent for burial at licensed landfill sites. Before this order came into effect renderers had not been restricted in how they disposed of this material once it had been processed into MBM and tallow.

Disposal of BSE carcasses and SBO: a chronological account

10.31 In this section we set out a chronological account of the Government’s response to the practical disposal and pollution control issues that arose as a result of the BSE slaughter and compensation scheme and the subsequent human and animal SBO bans. To illustrate the scale of the handling problems that faced MAFF

3791 The Bovine Spongiform Encephalopathy (No. 2) Amendment Order 1990; further details are in vol. 5: Animal Health, 1989–96
and local authorities, we preface each year from 1988 to 1996 with numbers of BSE carcasses involved.\textsuperscript{3793}

**1988**

<table>
<thead>
<tr>
<th>Year</th>
<th>Incineration</th>
<th>Burial</th>
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<tr>
<td></td>
<td>VIC</td>
<td>Farm</td>
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<td>1988</td>
<td>460</td>
<td>57</td>
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\textbf{10.32} BSE became notifiable on 21 June 1988 and the slaughter and compensation programme was introduced on 8 August 1988.\textsuperscript{3794} The statutory Orders required animals affected or suspected of being infected with BSE to be reported to the local Divisional Veterinary Officer (DVO). Upon inspection, if a veterinary inspector was satisfied that an animal was suffering from the disease, he or she would direct the slaughter of the animal and compensation would become payable to its owner.

\textbf{10.33} After slaughter, the carcass became the property of the Minister, and MAFF was responsible for its disposal. Ministers had accepted Sir Richard Southwood’s recommendation that the carcasses of BSE suspects be destroyed.\textsuperscript{3795} Officials envisaged that Ministry Veterinary Investigation Centres (VICs) would be used to incinerate the carcasses.\textsuperscript{3796} On 21 July 1988, Mr Cruickshank informed the Minister that:

\begin{quote}
We have until now envisaged that all carcases would be disposed of by incineration. It is becoming clear that in some cases there will be practical problems in arranging incineration, and the costs could be considerable. In these cases we are therefore now envisaging burial which can be a cheaper option and does not present unacceptable veterinary risks.\textsuperscript{3797}
\end{quote}

\textbf{10.34} Mr Meldrum had chaired a meeting two days earlier between MAFF officials and representatives of the National Farmers’ Union (NFU) and the National Cattle Breeders Association (NCBA).\textsuperscript{3798} The agenda included the safe disposal of carcasses. Mr Crawford, Dr Cawthorne and VI staff had been investigating incineration capacity.\textsuperscript{3799} VICs could probably cope with the incineration of the current level of cases of BSE but even with these there were potential problems over VIC location. It might become necessary to employ alternative methods, such as on-farm incineration by flame guns or wood and coal fires and burial.

\textbf{10.35} If burial was necessary, it was thought to more likely be on council tips than on farm, because of the costs involved and the objections of water authorities.\textsuperscript{3800}

\begin{scriptsize}
\textsuperscript{3793} BSE suspect or confirmed cases in Great Britain, obtained from a 1997 letter from Mr Hogg to Dr Gavin Strang. The data was based on information gathered from manual records held at SVS Animal Health Offices in Great Britain and presented in a letter by Douglas Hogg at DM01 tab 30 p. 10. Unfortunately, in that letter the individual figures given for the different types of disposal method appear to have been totalled incorrectly, and we have adjusted the totals accordingly.


\textsuperscript{3795} YB88/7.1/4.1

\textsuperscript{3796} YB88/6.23/2.5

\textsuperscript{3797} YB88/7.21/4.1

\textsuperscript{3798} YB88/6.23/4.1

\textsuperscript{3799} YB88/7.14/14.1–14.2

\textsuperscript{3800} YB88/8.05/2.3
\end{scriptsize}
10.36 The NFU representatives said that farmers might become ‘agitated’ if they were forced to keep infected animals on the farm until a space became available for disposal. Mr Meldrum said that ‘farmers should appreciate the logistical problems involved’, but stressed that ‘a priority system based on health and welfare considerations would operate’. He said that all cases would be slaughtered at the time of collection, so carcasses would not be left on farms waiting for collection.3801

10.37 Incineration was MAFF’s preferred method of disposal of BSE carcasses, primarily because public perception was that incineration was safer than burial.3802 However, as we shall see, the increase in cases was to outstrip by far the incineration capacity available and other disposal strategies had to be adopted.

10.38 The Veterinary Field Service (VFS) issued guidelines to its officers on 6 August 1988 on slaughter and disposal of BSE cases.3803 On disposal, they read: ‘The method of choice for disposal of the carcasses of animals slaughtered on the farm will be incineration at a VIC or at the CVL.’3804 Where this could not be arranged alternative methods of carcass disposal, ‘[i]n order of decreasing desirability’, were:

i. incineration off the farm, eg, on waste ground or at a local authority site;
ii. incineration on the farm by a contractor or local authority, using solid fuel or portable gas or paraffin-fired incineration equipment;
iii. burial off the farm, eg, on a local authority tip;
iv. burial on the farm by a contractor.3805

10.39 The guidance was revised six months later. In relation to disposal of BSE carcasses, the only significant change was that the Cambridge Pet Crematorium and a commercial incinerator were added to VICs as the preferred disposal options.3806 Later guidance did not differ greatly.

10.40 At the time, consideration was being given to developing other methods of disposal, such as burial in a lime pit. Dr David Taylor of the NPU in Edinburgh, replying on 9 August 1988 to a query about this from Mr Wilesmith, Head of Epidemiology at the CVL, mooted a study to determine the effect of calcium oxide on scrapie,3807 but we saw no indication that this suggestion was taken up by MAFF. Burial in lime was suggested again in 1993, but was dismissed partly on the basis that it actually preserved the infected tissue (see paragraph 10.105).

10.41 An indication that MAFF was beginning to encounter opposition to its carcass disposal programme comes from a further meeting held a month later, on 6 September, between MAFF officials and representatives of the NFU and NCBA.3808 The note reads:

Burial at public tips was often a cheap and convenient option but some water and local authorities were opposed because of the perceived ‘pollution’
problems. Incineration was being carried out but ‘centralised cremation’, as operated in Devon, was running into difficulties because of objections from local residents.\textsuperscript{3809}

10.42 It was agreed that local authorities would be consulted ‘to see if it was possible to dispose of carcasses using the facilities which operate for destroying toxic waste’. The Association of Water Authorities was also to be approached for consultation.

10.43 In an update on disposal of BSE carcasses sent to Mr Andrews on 2 December 1988, Mr Meldrum mentioned that some were being buried on local authority or Ministry of Defence land.\textsuperscript{3810} Mr MacGregor saw the advice and queried whether burial of infected carcasses was ‘wise’.\textsuperscript{3811} In response, on 19 December, Mr Meldrum gave advice that is, on the face of it, difficult to reconcile with the VFS guidance in August 1988, which advocated incineration. He wrote:

Burial is the preferred method of disposing of the carcasses of animals which have died or been destroyed because they are affected with a notifiable disease, always provided that soil conditions are suitable and the water authority agreeable. In my opinion it is a safe method of disposing of BSE carcasses.

BSE carcasses are currently being buried, mainly on licensed tips, in a number of counties, in each case with the full agreement and co-operation of the local authority and water board concerned. Except in Dorset and Wiltshire the number of carcasses buried at any site is small: larger numbers have been buried in those two counties without attracting any adverse local comment.

Where burial has been opposed by local residents despite the site having been approved by the authorities concerned (as has happened recently in Cumbria), then alternative disposal methods are adopted. In practice this means incineration on the farm or elsewhere, invariably at greatly increased cost. (Disregarding transport charges, burial costs vary from £17–£30, whereas the cost of incineration is measured in £100s).

Discontinuation of burial would further strain available facilities for incineration, which are already stretched.\textsuperscript{3812}

10.44 Mr Meldrum commented on this minute in a statement to the Inquiry. He explained that when he wrote that burial was the preferred method of disposing of the carcass of an animal that suffered from a notifiable disease, he would have been referring to diseases such as foot and mouth disease or swine fever.\textsuperscript{3813}

10.45 Mr Meldrum concluded his advice by saying:

In the circumstances I believe that some BSE carcasses should continue to be buried as now, and that this practice poses no greater risk to human or

\textsuperscript{3809} ‘Centralised cremation’ refers to the practice of cremating large numbers of carcasses on open pyres

\textsuperscript{3810} YB88/12.02/6.2

\textsuperscript{3811} YB88/12.13/3.1

\textsuperscript{3812} YB88/12.19/2.1 paras 2–6

\textsuperscript{3813} S184 Meldrum para. 145
animal health than does incineration. Indeed I believe that both practices are equally safe.\textsuperscript{3814}

\section*{1989}

\begin{center}
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
 & & \multicolumn{3}{|c|}{Incineration} & \multicolumn{3}{|c|}{Burial} \\
\hline
Year & VIC & Farm & Other & Total & Farm & Other & Total \\
\hline
1989 & 752 & 919 & 3,675 & 5,346 & 73 & 2,269 & 2,342 \\
\hline
\end{tabular}
\end{center}

\textbf{10.46} In a minute to Mr Meldrum on 13 January 1989, Mr Kevin Taylor discussed on-farm burial of BSE cases:

As far as I know – and I cannot be absolutely certain without speaking to every DVO – on farm burial occurs only in Cumbria, and is in any case a recent development. The need has arisen because the County Council, responding to pressure from a parish council, has revoked the permission which it originally gave for BSE carcasses to be buried in licensed toxic waste tips . . .\textsuperscript{3815}

\textbf{10.47} Mr Taylor wrote that he thought it was likely that other northern authorities would follow Cumbria’s example. He explained that both the Council and a local entrepreneur were willing to provide incineration services, but that farmers ‘apparently object strongly to incineration on their land, feeling that this publicises the case – though why this should be more obvious than burial is unclear’. He concluded that on-farm burial was the cheapest option available, in the circumstances.\textsuperscript{3816}

\textbf{10.48} Mr John Suich of Animal Health Division sent a BSE Situation Report to Mr Thompson, the Parliamentary Secretary, on 16 January 1989.\textsuperscript{3817} Mr Thompson had asked for this, together with alternative contingency arrangements. Mr Suich said that, of the 2,296 cases of BSE confirmed as at 13 January, almost half had occurred in the South West of England. The majority of these carcasses were now being incinerated by a single private company, which had a 12-month contract with MAFF to provide this service. This had allowed open cremations to cease in Devon, Cornwall and Avon. MAFF had also been able to ‘give up mass cremations of carcasses at a central site’.\textsuperscript{3818} Mr Suich’s report said that the current disposal arrangements for the region were working satisfactorily, with spare incinerator capacity available.

\textbf{10.49} So far as contingency arrangements were concerned, he said it would be possible to recommence incineration of some BSE carcasses at the CVL at Weybridge, but this might compromise the BSE research being conducted there. Private operators were making applications to install permanent incinerators in the South West, but hostile reaction from the public meant they were unlikely to succeed. Therefore, if the current disposal arrangements were to fail, or there was a marked increase in the incidence of BSE, the only available option (other than mass

\textsuperscript{3814} YB88/12.19/2.1 para. 6
\textsuperscript{3815} YB89/1.13/2.1
\textsuperscript{3816} Ibid.
\textsuperscript{3817} YB89/1.16/3.1–3.3
\textsuperscript{3818} YB89/1.16/3.2
cremation) would be on-farm incineration, using either open pyres or mobile incineration vehicles purchased by MAFF.\footnote{Ibid.}

\section*{10.50} Mr Suich observed in his report that ‘MAFF has been careful to maintain a neutral stance’ in the consideration of planning applications to install incinerators in the South West.\footnote{Ibid.} It is not clear what a ‘neutral stance’ was in this context. Mr Meldrum told the Inquiry in a statement that around this time he asked Mr Taylor and Mr Lawrence to help potential incinerator operators to obtain the relevant authorisations for the creation of new or expanded incinerator capacity for the destruction of BSE carcasses.\footnote{S184 Meldrum para. 169}

\section*{10.51} Meanwhile, by 30 January 1989, the number of carcasses which MAFF had to dispose of had risen to about 100 per week, in contrast with their estimate six months earlier of about 100 per month. On that day, Mr Meldrum wrote to Mr John Field, then Chairman of UKRA:

When the decision was taken, in July 1988, that cattle affected with BSE should be valued, slaughtered, and their carcases destroyed, it was intended that the carcases would be incinerated – preferably off the farm. In the event disposal has caused, and is continuing to cause, difficulties, because of the attitude of some local authorities who have been unwilling to assist in disposal arrangements.

About 100 BSE suspect cases are now being slaughtered each week. The incidence is still greatest in the South West and Southern England, but cases are occurring nationwide. As you already know, we have no reason to believe the number of cases will diminish significantly before 1992, at least as a result of any action which has been taken by the Ministry. It is therefore prudent that we explore the possibility of providing additional incineration facilities, preferably sited in the North Midlands and North-West England.

My purpose in writing is to ask whether any member of the Renderers Association would be interested in providing such facilities, which could be used by MAFF to dispose of carcases from the Northern half of England and Wales. In return we would, in principle, be willing to enter into a time limited contract to provide a minimum number of carcases for incineration at an agreed price. Any incinerator would, of course, have to comply with local authority planning consents and operating requirements.\footnote{YB89/1.30/6.1}

\section*{10.52} There was some response to this request,\footnote{YB89/4.00/9.1} and we examine later in this chapter the difficulties faced by private operators in obtaining incinerator licences.

\section*{10.53} Animal Health Division A prepared a draft paper at the end of March 1989 on the problems with disposal of carcases and setting out the results of a survey it had conducted.\footnote{YB89/4.00/9.1–9.8} Numbers had increased ninefold in 8 months but were now expected to remain at their current level for 2–3 years before falling off. By the end of February an average of 148 carcases were being disposed of each week, and a total of 3,462 had been disposed of since the slaughter and compensation scheme...
was introduced. Of these, 29 had been buried on farm and 782 on refuse tips. The remainder were cremated: 1,733 on farm, 254 by VICs and 664 by private or local authority incinerators. It seems that MAFF was finding it impossible to dispose of the rising number of carcasses using its method of choice, ie, incineration at a VIC, the Cambridge Pet Crematorium or a commercial incinerator.

10.54 Although open cremations had virtually ceased in the South West, minutes of a meeting held at Tolworth on 6 April 1989 show that they continued elsewhere in the country. Mr Kevin Taylor chaired the meeting, which was also attended by Mr Lawrence, Mr Maslin, Dr Matthews and others. The minutes of the meeting record:

1. An average of 130 carcases per week were currently being disposed of by burial or burning. South Eastern and Midlands and West Regions and, particularly the hardest-hit South Western Region had all experienced problems, and LAs and environmental bodies in all parts of the country were becoming increasingly antagonistic towards burial and open cremation as disposal methods.

2. Burning in closed incinerators was considered the preferred method of disposal and should replace all burials and open burning as soon as practicable.

3. The number of carcases for disposal was continuing to rise and could reach 200 per week and remain at that level until 1992 when it was likely to decline steadily to negligible numbers by 1997. In assessing our options therefore a throughput of 200 a week should be used.

10.55 It was agreed that:

Given the conclusion at 2 above the only options for the future were:

a. greater use of private and LA incineration services, including those possibly to be offered by UKRA members; and

b. building new incinerators at VI Centres.

MOD should also be approached about using their land in the event of times of crisis.

10.56 It was thought that building new incinerators at VICs was likely to be the cheapest option and their use would ensure complete and effective official control of disposal operations. However, no new MAFF incinerators could be operational in less than 12 months, so it would continue to be necessary to make extra use of private and local authority services until then.

10.57 MAFF subsequently corresponded with a number of potential candidates in the private sector for the provision of incineration services throughout the country. An example of this correspondence is a letter from Mr J J Frost, Director of Purchasing and Supply at MAFF, to a commercial incineration company, dated
2 May 1989. In that letter, Mr Frost sought a proposal from the company for the provision of both static and mobile incineration services and predicted that 250 carcasses would have to be destroyed each week until 1992, when the numbers would start to fall off.\footnote{YB89/5.02/7.1–7.2}

10.58 On 20 June 1989, Mr G W C Wilson, a DVO in Taunton, wrote to Dr Matthews reporting strong local hostility to planning applications for incinerators. At heavily attended parish meetings, residents had voiced fears of nuisance due to ‘smoke, smell, noise, traffic, faulty operating procedures, proximity to dwellings, schools and the local abattoir, river pollution, ash disposal, etc’. The County Planning Officer had indicated that the Crematorium Act 1902 might apply, requiring consent to be obtained from individuals living within 200 yards of the proposed premises. Prevailing opinion at the meeting was that MAFF should be supplying its own incineration facilities instead of permitting private enterprise to be involved. He had been asked many times for literature to explain what BSE was and felt that a leaflet was badly needed.\footnote{YB89/6.20/17.1–17.2}

10.59 In a letter to Messrs Pardoes, solicitors in Somerset, on 6 November 1989, Mr K Taylor explained the importance of providing suitable facilities for the disposal of carcasses of suspect cattle, particularly in the South West region.\footnote{YB89/11.06/12.1–12.2}

He wrote:

The Ministry is committed to a policy of destroying the carcases of suspect animals by incineration, as soon as the necessary facilities can be provided. If you have a slaughter policy for any disease there are only two practical methods of disposing of the carcases which are the inevitable consequence of that policy: burial or burning. Each can be done on the farm (if conditions permit) or elsewhere. We believe the most economical and acceptable method of disposal is incineration at centralised sites, using equipment which meets local authority planning constraints and is licensed in accordance with the requirements of the Waste Disposal Authority. We are embarrassed by our inability to satisfy our own policy requirement at present, and regard the provision of suitable facilities as a matter of utmost urgency.\footnote{YB89/11.06/12.1}

10.60 Mr Taylor went on to explain why the alternative methods of disposal were still so important:

Once the decision to introduce a slaughter policy had been taken Ministry Officials urgently sought the most appropriate and practical means of disposing of the carcases in each area, bearing in mind local needs and circumstances. Initially the number of cases being reported to the Ministry suggested that we had sufficient ‘in house’ incineration capacity at our own Veterinary Investigation Centres. However, as the number of cases increased to its present level, it became necessary to seek alternative means of disposal. Cremation is the preferred method of disposal, wherever possible using incineration plants. The other options are cremation on open pyres or by portable gas incinerators, and burial, either on licensed waste tips or on farm. Whilst burial is a safe and well-tried method of disposing of animals affected
by notifiable diseases, incineration remains the favoured option. Under laboratory conditions, exposure to 134°C for 18 minutes is sufficient to inactivate the Scrapie agent: incinerators operate at well in excess of this and we believe that, properly operated, they offer no risk to either human or animal health.\textsuperscript{3832}

10.61 Mr Taylor minuted Mr Meldrum on 2 August 1989 to inform him about progress in getting new incineration facilities up and running. All the proposed planning applications were running into difficulties. Somerset was facing stiff local opposition to applications for planning and waste disposal consents.\textsuperscript{3833} He and Mr Wilesmith would be briefing local authority officers, and possibly councillors, before the critical planning meeting. He wrote:

All proposals are bedevilled by local opposition: so far plans supported by Council Officers have been refused by selected councillors. Somerset County Council now seems ready to take a positive lead . . . even to the extent of over ruling parish and district objections.\textsuperscript{3834}

10.62 Someone has written at the end of the minute: ‘It would be a great pity – and cause severe difficulties – if we lost [a proposed site] when nothing else seems to be on the horizon.’

10.63 Mr Taylor minuted Mr Meldrum on 12 December 1989, recording that during the first nine months of 1989, 69 per cent of suspect carcasses were incinerated and 31 per cent were buried.\textsuperscript{3835}

1990

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10.64 On 30 May, the Association of Metropolitan Authorities (AMA) took up with the Department of the Environment (DOE) their concerns over possible pollution problems in relation to BSE carcass disposal. Mr Andy Elmer of the AMA wrote to Mr J W Smith of the Waste Management Division of DOE. He expressed concern that at a meeting on 23 May, when the issue of BSE was raised with him, Mr Pearce had stated that HMIP was ‘devoted to policing and policy rather than advisory functions’. He sought urgent advice on the disposal of BSE-infected waste:

The lack of advisory assistance from HMIP is causing some concern in authorities in regard to the safe disposal of disposal of cattle suspected to be suffering from Bovine Spongiform Encephalopathy. I, too have been unsuccessful in elucidating a definitive response from HMIP on the advised method of disposal of such cattle. It would seem that of the 250–300 cattle identified as affected by BSE each month about one third of the carcasses are being landfilled. It would appear that there is no advice or guidance on

\textsuperscript{3832} YB89/11.06/12.2  
\textsuperscript{3833} YB89/8.02/1.1–1.2  
\textsuperscript{3834} YB89/8.02/1.1 para. 7  
\textsuperscript{3835} YB89/12.12/9.1–9.4
whether landfiling is a reasonable option and similar worries surround the incineration of carcasses, in part due to the limited capacity and operating methods of incinerators used, and in part from the lack of knowledge of the agent responsible for the transmission of BSE. There is the attendant problem that cattle slaughtered on farms may justifiably be considered to be agricultural waste and therefore not falling within the requirements for dealing with controlled waste.3836

10.65 In response, DOE drafted guidance for the AMA, to be copied to other local authority associations, covering both incineration in closed incinerators, and landfill and licensed disposal sites. The draft was sent to Mr Maslin for his comments and included the following:

It is the Department’s view that all BSE affected carcasses and offal should be disposed of either at suitable incinerators or at licensed landfill sites providing adequate containment. Because of the potential for release of the infective agent into the wider environment, we should strongly advise against open air burning of carcasses or disposal in unlicensed landfill on farms.

... In circumstances where [incineration] plant is not available, landfill at disposal sites licensed to accept and dispose of such wastes under controlled conditions would be a satisfactory alternative. However, the Department believes that only disposal sites affording containment of leachate and landfill gas control should be used and, then, only after consultation with and confirmation by the NRA that there is no risk of groundwater pollution.3837

10.66 The draft guidance did not address the issue raised by Mr Elmer of whether cattle slaughtered on farm were ‘agricultural waste’ and hence falling outside the definition of ‘controlled waste’, which would have had implications for the disposal of their carcasses. Controlled waste included commercial, domestic and industrial waste. Agricultural waste was specifically exempted from the definition of ‘commercial’ waste and therefore from the definition of ‘controlled waste’. The different categories of waste, and the regulations surrounding them, are discussed in more detail in vol. 14: Responsibilities for Human and Animal Health.

10.67 On 9 August 1990 MAFF and DOE officials met to discuss the proposed guidance. DOE’s briefing note for the meeting said that:

MAFF have objected to draft DOE advice against landfiling or incineration of carcasses on farms. They say this is necessary in some cases because there is insufficient incineration plant capacity. MAFF policy is to increase incinerator capacity to deal with all carcasses but they report delays over granting of planning permission.3838
10.68 Under ‘line to take’ the briefing note said:

We will need to stress our concerns to MAFF about the potential environmental consequences of landfilling or open incineration on farms. Advice to LAs will need to reflect the shortage of proper incineration capacity and permit on farm disposal in limited and extreme circumstances. Explore constraints on additional incinerator capacity.

10.69 The actual note of the meeting recorded that:

The AMA letter (30 May) could be answered satisfactorily as MAFF and DOE were generally agreed on the disposal criteria, the AMA had no locus for incineration on farms, burial is only permitted where the burial is isolated from groundwater and satisfies WDA and NRA requirements and there is no need to mention burial on farms.3839

10.70 It was agreed that ‘Mr Bonsall would redraft response to AMA letter in liaison with Mr Hawkins [of the BSE Unit, MAFF]’.

10.71 On 17 August 1990, Mrs Simcock wrote to Mr Elmer responding to his letter of 30 May. She said:

3. The preferred method of disposal is by incineration at purpose built central facilities and in 1989 the majority of carcasses were destroyed in this way. Because there is a current lack of such facilities alternative disposal methods are approved by MAFF. In descending order of preference these are incineration on farms, landfilling and in very small number of cases disposal by burial on the farm.

4. MAFF are taking steps to increase the central incineration capacity so that in due course virtually all carcasses can be destroyed in this way. This policy of incineration has been adopted solely on grounds of public acceptability as there is no scientific evidence to suggest that supervised landfilling of carcasses poses public health or environmental risks.3840

10.72 As with the draft, this letter also failed to address Mr Elmer’s query about ‘agricultural waste’.

10.73 The Bovine Offal (Prohibition) Order 1989 (the ‘1989 Order’) had come into force on 13 November 1989.3841 It regulated the movement of SBO from the slaughterhouse. However, concerns had been raised about the dumping of unsterilised waste in breach of the regulations and MAFF undertook to follow this up with local authorities. In a letter to Mr Etheridge, the Secretary of the Association of District Councils, dated 15 June 1990, Mr Crawford emphasised:

[It] is the clear intention of the Regulations that no raw, untreated offal to which these Regulations apply should be taken to a landfill site for disposal, except in an emergency. There are no such restrictions on sterilised offal.3842

3839 YB90/8.9/13.2
3840 YB90/8.17/4.1
3841 L2 tab 3B
3842 YB90/6.15/5.1

911
Mr Etheridge had previously asked whether there were potential risks from the disposal of sterilised material. On this, Mr Crawford pointed out this could go only to appropriately licensed landfill sites and said: ‘I think it should be emphasised that we do not believe there are any risks arising from the practice.’

By mid-year, MAFF was apparently still unable to dispose of all of the carcasses by incineration. On 18 June 1990, Mr Lawrence minuted Mr Maclean, Parliamentary Under-Secretary, updating him on disposal of BSE carcasses and waste from carcasses. He reported that MAFF was ‘actively trying to establish a position where burial is no longer necessary’, and set out details of a newly finished incinerator and private sector plans for more to come. On waste he referred to Mr Crawford’s letter to Local Authorities (LAs).

Mr Maclean minuted Mr Gummer on 5 July 1990 to the effect that, if experimental attempts to infect pigs with BSE by injecting infected material into their brains were successful, MAFF would have to impose an animal SBO ban immediately. He thought preparation should be put in hand now for this eventuality. Mr Maclean gave evidence to the Inquiry that, when considering the need to prepare for such a ban, the logistics of disposal of the huge amount of SBO was foremost in his mind. He told the Inquiry:

. . . I think the enforcement side was not heavy in my mind at that stage because I knew all the authorities out there, the County Councils or District Councils could do it. I think it was a concern, what on earth do we do with this stuff? I cannot remember now how much I thought it was, but it must have been at least 100,000 tonnes I thought, quite a lot of extra material.

A meeting, chaired by Mrs Simcock of DOE, was held in August 1990 between MAFF officials, including Mr K Taylor, and officials from DOE, to discuss the disposal of BSE-infected carcasses. Mr J Bonsall and Mr J Grayson of the DOE raised concerns that seepage from landfill sites might pollute ground water, thus creating a public health risk. The note recorded:

It was stressed that only 30% of all carcasses were disposed of using landfill sites and then only with the approval of the local Waste Authority and the NRA. Due to approval always being sought it was assumed that these sites would adequately contain any seepage. It was also stressed that any BSE agent would be present only in tissues such as spinal cord, that amounts released would be minimal and that the dilution effect made it inconceivable that infection could be spread to cattle or any other species.

Mr Lawrence minuted Ministers on 8 October 1990 responding to their request for a note about research into alternatives to incineration and possible assistance with planning clearance. This note is discussed further in paragraph 10.81.
The introduction of the animal SBO ban

10.79 With the announcement that BSE had been transmitted to a pig during experiments at the CVL, a statutory ban on the use of SBO in animal feed was introduced in September 1990. The 1990 Order prohibited the inclusion of SBO or protein derived from SBO in any animal feed, thereby reducing its commercial uses virtually to nil. The Order did not specify how the 25,000–30,000 tonnes of SBO-derived MBM that was being produced every year should be disposed of. Also, it did not prohibit the continuing use of tallow derived from SBO. At a meeting with Mr Maclean, Mr Lawrence reported that MBM from SBO was largely being dumped on landfill sites.

10.80 There was some correspondence within MAFF in October 1990 about the possibility of using anaerobic digestion as an alternative to rendering for the disposal of slaughterhouse waste. Mr Lawrence wrote to Mr Lowson on 4 October, calling it an ‘interesting development’, but noting that:

. . . it does seem to have limitations in terms of capacity and the time taken to process the material. There may also be environmental objection in relation to the spreading of the liquor on the land.

10.81 On 8 October 1990, Mr Lawrence minuted Mr Gummer about disposal of carcasses:

Ministers will know that we have made strenuous efforts to increase incineration capacity to meet our requirements for disposal of BSE carcasses. In the first six months of this year, 7,911 BSE carcasses were destroyed; 5,841 (74%) by incineration and 2,057 (26%) by burial. This represents an improvement on the previous year when about two-thirds were incinerated. This also has to be considered against a background of increasing numbers of carcasses to be disposed of.

We anticipate increased incineration capacity – possibly an additional 150 carcasses a week – by the end of the year. We are also actively encouraging others who are interested. Meetings are held to discuss how to proceed and to describe the contractual arrangements we can offer. We are also prepared to assist the applicant on the technical/scientific aspects when the planning application is being considered.

10.82 On 17 October, Mr Keith Baker commented on Mr Lawrence’s minute about anaerobic digestion, expressing his reservations about its use as an alternative means of disposal. He said that he found it hard to believe that a system like this could manage with green offal or unfit carcass meat and their like. He thought the system might work if everything that entered it was finely chopped or minced, but qualified this by saying that the holding time would make it difficult to work in practice anyway. Despite this, Mr Baker said that it would be worthwhile asking the company which had designed this process for more detail.
At a meeting held on 9 November 1990 between officials in MAFF, the Department of Agriculture for Northern Ireland (DANI) and the department of Agriculture and Fisheries for Scotland (DAFS), it was noted that most MBM produced from SBO at that time was being sent to landfill, with local authority agreement, or being incinerated. Prosper De Mulder, a renderer, was said to be storing some in the hope of finding a use for it as fuel.\footnote{YN90/11.19/4.1}

In a paper which he sent to Mr Gummer on 18 December, Mr Lowson reported that about 75 per cent of the carcasses of BSE cases were now being destroyed by incineration. DOE had indicated they did not see the use of landfill for MBM disposal as a problem and advised local authorities. However, looming problems included new EC\footnote{YN90/12.18/3.11} requirements that fallen animals should be rendered, and the Environmental Protection Act’s stringent limitations on incinerators. The National Rivers Authority (NRA) were also working on guidelines that would make burial a very difficult option for many farmers. The lack of private sector interest in setting up incinerators and the expected ‘marked increase’ in cases over the next year would mean an increased need to dispose of carcasses by burial, ‘which runs into public perception problems and an increasingly hard line from the National Rivers Authority’, and open burning, ‘which is encountering opposition from local authorities, who may also need to authorise sites used repeatedly, and from the MOD [Ministry of Defence] who own the most likely sites’\footnote{YN90/12.18/3.7}. Mr Lowson also mentioned anaerobic digestion in the context of discussing alternative means of disposal of SBO, noting that it and the manufacture of biotechnology products ‘need to be seen as a limited means of reducing costs or adding value rather than as an alternative method of disposal’.\footnote{YN90/12.18/3.7}

Towards the end of 1990, Dr Taylor began studies at Prosper De Mulder’s Doncaster plant, to ascertain whether any of the rendering processes in commercial use within the EU were capable of inactivating the BSE agent. He started a similar study to determine the possibility of inactivation of the scrapie agent in the autumn of 1992.\footnote{ST50 Taylor p. 2; papers at Veterinary Record, vol. 137, p. 605 and vol. 141, p. 643}

### 1991

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An article by Dr Brown and Dr Gajdusek, published in the *Lancet* on 1 February 1991, reported that the brains of scrapie-infected hamsters had been shown experimentally to remain infective after burial in soil for three years.\footnote{LY90/12.18/3.7} This sparked press interest in the safety of burial of BSE carcasses. In briefing her colleagues in case they had to answer press queries, Dr Pickles appeared to echo the words of Mr K Taylor at his meeting with DOE officials in August 1990, writing:

\footnote{LY90/12.18/3.7}
Points to note are:

- the heads of suspect BSE cases are removed and the brains incinerated after diagnosis
- any remaining BSE contamination of carcasses would be slight, dilute and diffused by deep burial
- the chance of a sufficient dose of this infection coming together and being able to infect another animal is extremely remote
- nevertheless, the preferred method of carcass disposal is incineration, and virtually all BSE carcasses are disposed of this way
- none of this has any human health implications.3859

10.87 In March 1991, Mr Lawrence provided Mr Maclean with a comprehensive update of the situation on disposal of animal waste. He reported that MAFF had ‘successfully persuaded’ DOE to exempt small-scale incinerators (processing less than 50 kg per hour) from the provisions of Part I of the Environmental Protection Act 1990.3860 Part I dealt with such things as emission limits and controls, requirements for monitoring of emissions and the making of tests and inspections of the incineration process, prescribed combustion conditions, and other construction requirements.3861 Mr Lawrence advised that compliance with these provisions would have entailed costs in the region of £3,000 per incinerator, and that the DOE had originally intended to exempt only those incinerators with a capacity of less than 25 kg per hour. He believed that the cost would have discouraged farmers, hunt kennels and others from installing incinerators.3862

10.88 Mr Lawrence also noted that MAFF had written to DOE to ‘stress the importance of ensuring that planning authorities are made aware of the need for a “balanced assessment” when determining applications for incinerators’.3863

10.89 Mr Lawrence also mentioned the investigations that were under way into other means of disposing of waste. He thought the fuel option was the best bet. The Meat and Livestock Commission (MLC) was analysing a number of new technologies, including aerobic and anaerobic digesters, rapid composting processes, toxic waste destruction systems and super-heated air systems.3864 It is not clear from Mr Lawrence’s minute whether it was envisaged that these systems would enable disposal of entire carcasses, or only slaughterhouse and knackery waste.

10.90 Shortly after MAFF’s discussions with DOE about this matter, there were further discussions and correspondence between them on the issue of local authority registers of land which might be contaminated. DOE was preparing a draft consultation paper and proposed to include animal processing works in the registers. MAFF took great exception to this. Ms Judith Denner of DOE’s Contaminated Land Division explained in a letter to Mr G A Lewis of MAFF’s Environmental Protection Division:
The proposal to include animal processing works, including slaughterhouses, is not solely to identify sites where organisms causing communicable diseases may still be present. Contaminants which may be found at old slaughterhouses are likely to include effluvia of various sorts, blood, entrails etc. We will also cover renderers, knackers’ yards etc.\textsuperscript{3865}

**10.91** She also identified for inclusion burial sites for diseased animals. Mr Lewis’s reply said:

I am afraid that I do not follow your reasoning for the inclusion of slaughterhouses in the registers. Can I take it that, for the reasons set out in my letter of 4 April, you accept that slaughterhouses do not represent a greater risk of contamination from communicable disease than any other premises where animals or meat are present? If so, what is the risk you are hoping to identify? Blood and entrails are not contaminants in themselves. If you are going to label an industry as potentially contaminating, particularly one as vulnerable to adverse publicity as the meat industry, you should be clear as to what the potential is. In our view the inclusion of slaughterhouses and indeed knackers yards, renderers etc in the register is neither valuable or logical.\textsuperscript{3866}

**10.92** He also strongly resisted the proposal to register burial sites and in the event the plans were dropped.

**10.93** In March 1991, Mr D R Williams of Welsh Office Agriculture Department (WOAD) had recorded the outcome of a meeting he had with Mr Kevin Taylor, staff from Tolworth, and others, on 19 March. He wrote:

It is now policy that we should be moving as quickly as possible towards central incineration and away from burial and on-farm incineration. Current central incineration capacity (theoretical 725 carcases per week: in practice, 450) can barely cope with the some 500 animals that are being slaughtered each week and there will undoubtedly be difficulties if the predicted increase to some 700 animals per week happens quickly.\textsuperscript{3867}

**10.94** Mr Williams noted that, to increase capacity, some private crematoria were given contracts to handle either guaranteed tonnages, or the carcasses from particular areas. About 45 per cent of all BSE carcasses were from the South West of England and because of a shortfall in incineration capacity many had to be transported for incineration at crematoria in Cambridge or Wales.\textsuperscript{3868}

**10.95** In discussing the safety of on farm burial of BSE carcasses at its 11 April meeting, the Lamming Committee noted:

On-farm burials of suspected cases were extremely rare – so far only 18 of the confirmed cases of BSE had been buried on-farm.\textsuperscript{3869}
In August 1991 the MLC published their *Final Report of the By-products Study*, which examined a number of alternatives to rendering for the disposal of SBO, including anaerobic and aerobic digestion, using bacterial fermentation. This method was thought to suffer from a number of drawbacks, most importantly, the costs associated with the construction and running of large fermenters and the lack of knowledge surrounding the operation of fermenters running on input waste with high nitrogen and high solids. Reservations were voiced about the lack of a solid technical background for what actually happened to the waste and what the nature of the liquid and solid waste would be under such conditions. Furthermore, the liquid waste could be difficult to treat and dispose of, with potential for foul odours.\(^\text{3870}\)

One further problem was that the high fat content of offal might lead to ‘serious operating and effluent problems’, because fat would be consumed very slowly by the bacteria in the fermentation process, leading to a build-up in the fermenter. One suggested solution was to render the material first so that the tallow could be removed and sold.\(^\text{3871}\)

Another option investigated in the *By-products Study* was the processing of certain types of offal into high-value products, such as pharmaceuticals and biochemicals. However, no process was currently in use that required large quantities of offal. The other problem identified was the need to ensure that the offal used in the production process was obtained from a safe source, ie, one free from diseases such as BSE and salmonella. Since 1989 government guidelines for medicinal products had been agreed which stated:

> Bovine material should come from animals, taken from a closed herd in the female line since 1980, in which no animal has been clinically suspected of having BSE, and which has not been fed rations containing ruminant derived protein during that period.\(^\text{3872}\)

To comply, many manufacturers were now sourcing the material from outside the UK, preferably from New Zealand.\(^\text{3873}\) The guidelines were superseded in 1992 by European guidelines which stated that material should be sourced from countries with no reported cases of BSE, if they have veterinary services capable of detecting a low incidence of disease and if BSE is reportable. Materials could also be sourced from countries with a ‘low incidence’ of BSE, if a number of precautionary measures were taken, including destroying all affected carcasses, and not using any progeny of affected animals.\(^\text{3874}\) For more detail, see vol. 7: *Medicines and Cosmetics*.

The Bovine Spongiform Encephalopathy Order 1991 (1991 Order) introduced a licensing system for the disposal of protein derived from SBO.\(^\text{3875}\) The Order came into force on 6 November 1991. Article 9 prohibited its removal from any premises ‘except under the authority of a licence issued by an officer of the appropriate Minister and in accordance with the conditions subject to which the licence is issued’. The object was to ensure that all SBO-derived MBM was sent

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\(^{3870}\) M44A tab 6 pp. 44–5
\(^{3871}\) M44A tab 6 p. 45
\(^{3872}\) YB89/2.23/6.7
\(^{3873}\) S422 Rotblat para. 75
\(^{3874}\) YB91/12.11/3.5
\(^{3875}\) L2 tab 7
either for burial in a licensed landfill or for incineration.\textsuperscript{3876} The same was true for tallow. A note from Mr Hutchins to Mr Crawford in May 1991 had noted that ‘there was little evidence to suggest that tallow produced from SBOs was handled separately from tallow produced from other offals.’\textsuperscript{3877}

\textbf{10.101} By the end of 1991 there were finally enough incinerators on-line to satisfy MAFF’s requirements. In \textit{The Report of the Chief Veterinary Officer: Animal Health 1991} Mr Meldrum wrote:

Additional commercial incinerators became available during the year, permitting all BSE carcases to be incinerated.\textsuperscript{3878}

\textbf{10.102} The Report provided breakdown of how 28,918 BSE carcases were disposed of in 1991:\textsuperscript{3879}

- 318 carcases were buried, all off farm;
- 492 carcases were incinerated on farm;
- 2,545 were incinerated at VICs; and
- 25,563 were incinerated elsewhere.

\textbf{1992–93}

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\textbf{10.103} 1992 was the year that the number of new confirmed cases of BSE in the UK peaked. For detailed statistics on the number of confirmed cases of BSE in the UK, see vol. 16: \textit{Reference Material}. However, the disposal situation was now under control. Up to then, the carcases of 6,117 cattle affected by BSE had been disposed of in 59 landfill sites in Great Britain.\textsuperscript{3880} MAFF told the Inquiry that no BSE suspects were disposed of to landfill after 1991. Only two BSE carcases were buried in 1992, both on farm, and none in 1993.\textsuperscript{3881}

\textbf{10.104} In 1993, MAFF, Scottish Office Agriculture, Environment and Fisheries Department (SOAEFD) and WOAD issued an animal health circular (AHC) in response to Regional Veterinary Officers’ (RVOs’) concerns about the options available in the event of outbreaks of notifiable disease that required entire herds or flocks to be slaughtered. The RVOs may have been worried that the disposal infrastructure, which had been stretched to the limit by the BSE crisis, might not be able to cope with such an outbreak.\textsuperscript{3882} The AHC advised that:

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i. centralised incineration of carcasses from infected premises was not a practical option, and that it was doubtful whether the entire available incinerator capacity currently in use for the disposal of BSE suspects would ever be able to cope with more than very minor outbreaks of a notifiable disease;

ii. rendering could not be used for disposal of diseased carcasses so much in the future because renderers were reluctant to accept such material;

iii. the National Rivers Agency (NRA) seemed less willing to approve on-farm burial sites than in the past; it had to be consulted locally to determine where the trouble spots were;

iv. the NRA also had to be consulted about cremation sites; and

v. the general provisions of Part III of the Environmental Protection Act 1990 applied to open burning and cremation pyres, so they had to be placed where the smoke would not create a nuisance.

10.105 In April 1993, MAFF forwarded to the Spongiform Encephalopathy Advisory Committee (SEAC) extracts of an advance copy of a book on scrapie and BSE written by Dr G Hunter, a former Deputy Director of the Agriculture and Food Research Council. MAFF’s covering note advised that the book was due to be published that month. In the book Dr Hunter discussed MAFF’s policy of incineration of BSE-affected carcasses, calling it ‘misconceived’. He wrote:

> Another difficult question posed by mad cow disease is how to dispose of the carcasses. The policy of the Ministry of Agriculture has been to dispose of them by burning. Initially, there was extensive burning on open ground, and this has continued from time to time when incinerator facilities have been overstretched. This procedure is, in my view, quite appallingly misconceived. The scrapie agent (and hence, presumably, the mad cow agent) is exceptionally resistant to heat, and a large proportion would simply depart intact with the smoke and gases generated by the fire. I can conceive of few better techniques for distributing it far and wide over the countryside. Of course, the intention is to burn all carcasses in future in modern incinerators with efficient afterburners. Even here I am doubtful whether it will be possible to prevent a small amount of active agent from flashing through the afterburners; the temperature might be several hundred degrees centigrade, but if the agent is only exposed for milliseconds it might still survive. But there is no doubt that very little active agent should survive after incineration in efficiently operating modern incinerators, and any hazard to man or animals would then be negligibly small. The real risk, however, lies in the fact that in time all incinerators break down. Perhaps they wouldn’t if a fully qualified engineer was standing by them day and night; but this certainly isn’t going to happen day in and day out, and sooner or later the breakdown will occur, with massive release of active agent for up to a mile or so around (farther if there is a strong wind). I well remember our very up-to-date incinerator at Compton breaking down one day, and one could hardly bear the smell of the acrid smoke half a mile downwind of the incinerator.

I consider the Ministry’s policy here misconceived. What they should be doing is burying the bodies of the cattle in lime on the farms where the disease occurred. If the scrapie analogy holds, the soil surface on these farms
will be heavily contaminated anyway, and there would be no danger of contaminating men and vehicles when transporting the carcasses away. There would also be negligible danger of contaminating watercourses underground, because scrapie loses activity if the particles that are active are reduced to a fully soluble form. Although the lime would reduce scrapie infectivity only very slightly, it would accelerate the disintegration of the carcasses; and scrapie is eventually destroyed by bacterial and fungal attack. It would not survive like anthrax because it cannot form the equivalent of a bacterial spore. Burial in lime on the farm seems to me to carry so many advantages over incineration (it would be cheaper too) that I can only repeat that the Ministry of Agriculture’s policy puzzles me.\textsuperscript{3883}

10.106 MAFF defended its position in the covering note to SEAC:

Our current objective is, whenever possible, for BSE carcasses to be incinerated under contract in dedicated private incineration plants. We now have sufficient incineration capacity to achieve this and in 1992 only two carcasses had to be buried. The plants used are licensed by local authorities and are contracted to the Ministry. The contracts contain standard conditions for the operation of the plants which are strictly monitored by MAFF.

The incinerators used have a hearth temperature of between 700 and 800\textdegree C. The temperature in the afterburner chamber usually exceeds 1100\textdegree C and the dwell time is 2 seconds (not microseconds as the book alleges). These are laid down by the licensing authorities and are continuously recorded. As safety features in case of breakdowns the incinerators have audible and visible breakdown warnings and interlocking to prevent charging of the primary chamber if the secondary chamber temperature is too low. Again these are licensing requirements.

Although we consider burial to be a safe method of disposal it is not our preferred option primarily because public perception is that incineration is safer than burial. We also encountered difficulties in the early days of the epidemic, when burial was the main method used, with local authority licensed sites being closed to us one by one because of exaggerated concern over BSE and local public pressure. On-farm burial similarly became more difficult as permission to do so was refused by more and more water authorities concerned over contamination of water courses.

The idea of burial in lime on the farm of origin as the best method of disposal is, we believe, flawed. Not only does lime actually preserve buried carcasses rather than accelerate disintegration but also there is no evidence to support the suggestion that the soil surface on farms where BSE has occurred is heavily contaminated. Indeed, when dealing with purchased animals we would be burying carcasses on premises where BSE has not occurred.

As explained above the option of burial for BSE carcasses is unlikely to be available for the great majority of future cases. Nevertheless, the Committee are asked for their views on the suggested method of burial in lime on-farm
and for endorsement, if appropriate, of the disposal methods in current use in respect of the risk of exposure to the BSE agent.3884

10.107 At its next meeting, on 22 April 1993, SEAC ‘agreed that incineration was preferable to burial’.3885 Presumably this means that the Committee members shared MAFF’s opinion on Dr Hunter’s ideas about burial in lime.

1994–96

<table>
<thead>
<tr>
<th>Year</th>
<th>Incineration</th>
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<td></td>
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<td>Other</td>
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<td>8,841</td>
<td>9,643</td>
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</tr>
</tbody>
</table>

10.108 MAFF’s and the public’s concerns about the disposal of BSE carcasses appear to have subsided, as the number of BSE cases began to fall, relieving the pressure on disposal facilities.

10.109 By April 1994 the results of Dr Taylor’s BSE inactivation study had been made available to the EC. Because these results had shown no rendering procedures were totally effective in inactivating the BSE agent, the EC redefined the conditions under which MBM could be manufactured if it was to be fed to farm animals (Commission Decision 94/382/EC3886). This Decision was issued in June 1994.3887 In the context of waste, this meant that MBM derived from SBO could not be considered safe, and was truly ‘waste’ in the sense of not having any use at all.

10.110 Also in 1994, the Advisory Committee on Dangerous Pathogens (ACDP) published guidance for workers entitled Precautions for work with human and animal Transmissible Spongiform Encephalopathies.3888 In relation to disposal of waste, the guidance advised that the carcasses of animals that had been experimentally infected with TSE should be disposed of by incineration.3889 It also advised that:

... final disposal of processed tissue should be by incineration using appropriate precautions during handling and packaging for carriage. Stored fixed material (bulk tissue, blocks and stained or unstained slides) from known or suspected cases of TSE must be handled as though it were infectious, and attention paid to the possibility of sharps exposure.3890

10.111 This was somewhat in contrast to the position in March 1989, when the risk to slaughterhouse workers had also been considered. It was felt at that time that BSE should be an impetus to encourage ‘all at risk occupationally to improve their normal standards of work hygiene’. It was suggested that ‘BSE should not, at this
time, be singled out. For further discussion of this topic see Chapter 8 of this volume.

10.112 During both the BSE and the later scrapie inactivation studies, a few tallow samples were tested for infectivity. No infectivity was detected in any of the tallow samples, even though one of them came from a process that produced highly infectious MBM. The overall conclusion was that neither BSE nor scrapie agents had a predilection to associate with fatty material like tallow. Nevertheless, some protein could be found in tallow. Therefore the theoretical possibility of the presence of extremely low levels of infectivity could not be formally excluded. As set out below, the Specified Bovine Offal Order 1995 reflected this by allowing tallow derived from SBO to be used for non-food or non-feedstuff purposes, or to be used in animal feed only after being subject to thermal hydrolysis at hyperbaric pressure. It, therefore, did not necessarily have to be disposed of as waste.

10.113 On 11 July 1994, Dr Matthews gave advice to Mr Eddy about ‘the effect of decomposition on the survival of the BSE agent in the context of disposal of BSE carcasses at landfill sites’. It is not clear what prompted Mr Eddy to ask for this. In his advice, Dr Matthews gave a brief account of MAFF’s efforts to dispose of carcasses:

We have traditionally disposed of carcases affected with notifiable diseases by burial, incineration or rendering, depending on the disease and local circumstances. With [foot and mouth disease] in particular, burial is preferred because it is the quickest and cheapest option, and carries less risk of disease spread than methods which require the carcass to be removed from the farm. In general there has been no evidence that burial has failed to inactivate the organism causing the outbreak. The one significant exception is anthrax. This is because anthrax spores are extremely resistant to environmental changes (including degradation of the carcass), and can reach the soil surface at a later date through the action of earthworms in particular. Incineration is therefore the preferred method of disposal for carcases infected with anthrax.

With BSE, we were left in 1988 with a preferred means of disposal – incineration – but insufficient incineration capacity to satisfy demand. Incineration was preferred purely on grounds of public and farmer perception, in that the animal/carcase was seen to be totally destroyed and moved from the farm, thus eliminating danger of recrudescence on farm. Unfortunately, in the absence of sufficient incineration capacity, off-farm burial remained an option until 1991 simply because we had no alternative. We only used land-fill sites approved for receipt of organic waste, and where it was assumed that site approval would take into account potential for contamination of ground water. There was no concentration of carcases at any one location in a tip, thus making it less likely that significant pockets of infection could remain. In all instances the carcases would have been buried without the head. At that time, after removal of brain tissue for diagnosis, the skull was incinerated at VICs.
10.114 Dr Matthews referred to the experiment whereby Dr Brown and Dr Gajdusek buried scrapie-infected material for three years (see above), and noted that the infectivity had been reduced by about 98 per cent. In commenting on this study, he wrote:

We believe that the process of decomposition in an entire carcase, buried so deeply as to avoid the protective effects of cold weather, would be more rapid and more acute than experienced in this experiment. We . . . would expect changes in the intact carcase with viscera still present to be more severe. Lime is no longer used at the time of burial precisely because it can delay acidification (this applies to burials for other reasons too).\(^{3896}\)

10.115 The VFS again revised its guidelines for the treatment of carcasses affected by BSE in March 1995. They were not materially different from the 1992 guidelines and continued to promote incineration at a VIC or commercial incinerator as the preferred method of disposal. Discussing alternative means, the guidelines said that incineration on farm using solid fuels, rather than gas or paraffin, was to be undertaken only ‘in exceptional circumstances, after consultation with appropriate authorities’.\(^{3897}\)

10.116 The Specified Bovine Offal Order 1995 introduced changes to the regime for handling and disposal of SBO. The object was to avoid cross-contamination. Only a rendering plant which had been ‘approved’ by the Minister was allowed to process SBO now.\(^{3898}\) At these plants, all MBM derived from SBO had to be placed in a container labelled ‘specified bovine offal’ and disposed of:

i. by burial at a licensed landfill site;

ii. as specified in the rendering plant’s approval; or

iii. in an approved incinerator.\(^{3899}\)

10.117 All tallow derived from SBO had to be placed in a container marked ‘specified bovine offal’ and:

i. disposed of by burial at a licensed landfill site;

ii. sent for purposes not connected with the preparation of food or animal feed; or

iii. sent for treatment by thermal hydrolysis at hyperbaric pressure (whereupon the resultant fatty acids could be used in animal feed).\(^{3900}\)

10.118 The operator of the rendering plant had to maintain records for two years of the weight of SBO-derived MBM and tallow consigned by the plant, as well as the date and destination of each consignment.\(^{3901}\)

10.119 By June 1996 the results of Dr Taylor’s scrapie inactivation study had been made available to the EC. Bearing in mind the earlier BSE inactivation study, and because these results had shown that all but one of the EU rendering processes failed
to inactivate the scrapie agent, the EC brought in a requirement that the only acceptable method for producing MBM for feeding to farm animals would be one involving steam under pressure at 133°C (Commission Decision 96/449/EC – July 1996).\footnote{L4 tab 6} The same studies concluded that solvent extraction led to only a very modest reduction in the levels of infectivity of scrapie.\footnote{S150 Taylor pp. 2–3} This reinforced the status of MBM derived from SBO as ‘waste’.

\textbf{10.120} In June 1997 the Environment Agency received a report it had commissioned from Det Norske Veritas (a firm of technical consultants), on an ‘Overview of Risks from BSE via Environmental Pathways’. The report was prepared in order that ‘the main issues of concern to the Environment Agency could be identified and to help determine what options were available for dealing with any issues raised’. The risk model used the following main elements: identification of pathways; infectivity of cattle waste products; and the transport and fate of cattle waste products in the environment.\footnote{M70 tab 10 p. 1}

\section*{Thruxted Mill}

\textbf{10.121} Some of the events relating to the Thruxted Mill which gave rise to issues of interest to the Inquiry occurred at dates outside the terms of reference of the Inquiry. However, evidence relating to Thruxted Mill illustrated some aspects of the waste disposal processes in a rendering plant during the period up to 20 March 1996 and sheds light on how local authorities and other government bodies assessed the impact of BSE on pollution.

\textbf{10.122} Thruxted Mill is a rendering plant in the Canterbury area and has been in operation since 1917. On 1 May 1996 it was licensed as one of the plants authorised to render specified bovine material (SBM) and cattle culled under the Government’s Over Thirty Months Scheme (OTMS).\footnote{S19B Colchester p. 3. The Over Thirty Months Scheme operates pursuant to the Fresh Meat (Beef Controls) (No 2) Regulations 1996 – L2 tab 24} In late June 1996 the Environment Agency (Southern Region) commissioned a risk assessment on the impact of the disposal of cattle effluent from the Thruxted Mill site. In March 1997 the risk assessment report noted the plant was licensed to process approximately 2,000 carcasses per week (equating to around 1,000 tonnes of material each week).\footnote{M70 tab 9 p. 1}

\textbf{10.123} The Mill is located above the North Downs chalk aquifer, which has long been used for public water supply. The Environment Agency report identified two operational public water supply boreholes, serving 140,000 people, located within 3.25 km of the Mill, both of which were in operation for many years before the onset of BSE. A third non-operational borehole was located 3.5 km north of the Mill.\footnote{M70 tab 9 p. 7}

\textbf{10.124} The Environment Agency reported that the Mill was not connected to main drainage and was approximately two kilometres from the nearest foul sewer. Since the early 1970s most of the surface drainage (from yards and roofs in the plant complex) had been directed through the effluent-holding tank and subsequent treatment systems. Earlier arrangements for surface drainage were uncertain, but it
was understood that during the 1960s the yard drainage was directed to a large-diameter well. The report found evidence to suggest ‘that small amounts of surface water have been discharged to the well until recently’.3908

Treatment and disposal of waste products from the rendering process

10.125 The report described how water driven off during the rendering process was condensed to form an effluent stream, which received primary treatment via a three-stage sedimentation tank.3909 Before 1985 the plant disposed of the treated effluent by discharging it into soakage trenches in wooded areas of land adjacent to the plant and allowing it to seep into the ground.3910 After first passing through clay, this treated effluent contributed to the recharge of the aquifer.3911

10.126 The Environment Agency provided evidence to the Inquiry that until May 1996 the solid material (sludge) produced from primary treatment of the effluent at Thruxted Mill was spread on fields in Kent. In the same month, shortly after the Mill was licensed to render culled cattle from the OTMS, the Environment Agency required the Mill to cease spreading the sludge on land. At first the Mill attempted to feed back the sludge into the rendering process, but this was unsuccessful. During the rest of 1996 and for much of 1997, the sludge was transported to Chelmsford and treated in an activated sludge plant before disposal onto fields in Essex. The sludge ceased to be transported in late 1997, when it was once again fed back into the rendering process at the Mill.3912 The disposal of solid material such as sludge is covered by the Solid Waste Management Licensing Regulations 1994. For further information on the treatment of different kinds of waste see Chapter 9 of vol. 14: Responsibilities for Human and Animal Health.

10.127 In 1985 the Southern Water Authority set discharge consent conditions relating to the total volume of effluent discharged per day and its composition.3913 The discharge consent conditions were not of a kind that would have had any effect on BSE infectivity. The Environment Agency report noted in 1997 that since August 1985 the treated effluent had been irrigated to the ground surface via pipes, which were moved regularly to provide uniform irrigation to the old discharge area. Between 1988 and 1996 the estimated discharge was between 80 m$^3$ and 100 m$^3$ per day, well within the discharge consent of 120 m$^3$ per day. However, in the absence of suitable on-site treatment facilities the effluent failed to meet the conditions with respect to the composition of the effluent.3914

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3908 M70 tab 9 p. 23
3909 S198 Colchester p. 3. Primary treatment involves settlement of effluent to remove solids
3910 M70 tab 9 p. 23
3911 M70 tab 9 p. 1
3912 DO01 tab 12 p. 15
3913 M70 tab 9 p. 24. The Environment Agency told us that the relevant sections of the Control of Pollution Act 1974 came into force on 4 July 1984, thus giving powers to the relevant authorities to set discharge consent conditions on certain effluents (S563 Environment Agency para. 2.2)
3914 M70 tab 9 pp. 23–4
New effluent treatment plant and disposal system

10.128 In 1995 the Mill’s owner, Canterbury Mills Ltd, was successfully prosecuted by the NRA following a breach of the consent conditions we referred to above in October 1994, and was fined. The prosecution the company drew up plans for making substantial improvements in effluent quality and the system of disposal, which were agreed with the Environment Agency on 28 November 1995. The plans involved considerable work on improving the treatment plant, most of which has since been completed. The Environment Agency told the Inquiry:

Part of the plan was to discharge improved quality aqueous condensate to a new subsurface soakaway, the subject of the Planning Inquiry in January–February 1997. The Agency, to take account of the planning situation and to increase its enforcement capability, issued a prohibition notice on the Mill in November 1996. That notice, in addition to further quality conditions, imposed a time limit on discharges to the existing surface soakaway.

10.129 The new treatment plant consisted of a dissolved air flotation unit, a rapid sand filter and a biological treatment plant. The effluent was first treated in the dissolved air flotation unit to reduce the suspended solids in the effluent. It then went through biological treatment, which reduced the biological oxygen demand and ammoniacal nitrogen. It then passed through a further dissolved air flotation unit and finally to the sand filter for polishing.

10.130 The subsurface drainage system was to consist of 43 lateral soakaway pipes buried less than one metre below the surface of a new area of land. Although the Mill and the land previously used by it for effluent disposal lie within the territory of Ashford Borough Council, the new drainage system was planned in a new area lying just across the border, within the jurisdiction of Canterbury City Council. Canterbury Mills Ltd therefore had to apply to that council for planning approval to construct the drainage system. It lodged the application on 31 January 1996.

10.131 In a statement the Environment Agency told the Inquiry:

... a series of events starting with the ministerial statement establishing the connection between BSE and new variant CJD in March 1996 and including the selection of the Mill by MAFF to render SBM as part of the selective cull, led to the Agency immediately organising an enhanced regulatory regime.

In addition, the Agency employed two independent specialist consultants to review all relevant risks associated with effluent disposal from the site. The Consultants first visited the Mill in early June 1996.
This risk assessment report was presented to the Environment Agency in March 1997.\textsuperscript{3924}

As with the Mill and the existing soakaway, the proposed soakaway was located directly above the chalk aquifer. There were concerns among members of the public about the possible risk to the local population if effluent contaminated with BSE prions made its way into the water supply. Dr Alan Colchester set out these concerns in his statement to us.\textsuperscript{3925} In the same statement Dr Colchester wrote that:

\begin{quote}
while the proposed new system seemed likely to reduce problems of odour and offensive surface lagoons of effluent, I did not feel satisfied that the new system would avoid the theoretical risks to employees or passers-by of surface contact with infectivity in the effluent.\textsuperscript{3926}
\end{quote}

During its consideration of the planning application the Council was presented with conflicting scientific views about the potential health risks associated with the planned drainage system. As a result, it was not immediately able to grant or refuse the planning application by the factory and on 26 March 1996 it deferred the decision ‘pending consultation on safety issues’.\textsuperscript{3927}

In July 1996 the Mill owners appealed to the Secretary of State on the grounds of non-determination by the Council. The appeal was heard in a public planning inquiry in Canterbury in February 1997.\textsuperscript{3928} The Environment Agency had been consulted by Canterbury City Council on the planning application, and it was now invited, along with other parties, to provide evidence to the Planning Inquiry as an ‘interested party’. The consultants who were preparing the risk assessment report for the Environment Agency used their work in progress to prepare reports, which were presented at the planning inquiry, on behalf of the Agency.\textsuperscript{3929}

At the time of writing no decision had been made on the appeal.

### Spreading blood on land

On average, a slaughtered cow yields about 13.6 kg of blood. While blood is not the main product of the slaughtering process, valuable uses could usually be found for most of it. A small amount was sold for use in the manufacture of processed food (eg, black pudding, adhesives for sausages), pet food, fertiliser, glue, foam fire extinguishers and pharmaceuticals and the preparation of leather.\textsuperscript{3930} However, most blood collected in slaughterhouses went to renderers to be made into blood meal for use in animal feed manufacture.\textsuperscript{3931}

Where no valuable use could be found it was not uncommon at the onset of the BSE crisis for the unprocessed blood to be spread on land, including grazing land.
For the slaughterhouse operator spreading blood on land was an inexpensive way to dispose of a by-product which would otherwise be viewed as waste. For a farmer on whose fields the blood was spread it was a useful fertilisation measure. Therefore, it recycled an otherwise useless by-product of one process for use in another. It could only be done subject to the consent of the local authority, and the landowner had to be licensed under the Control of Pollution Act 1974.3932 Once the blood had been spread the Diseases of Animals (Waste Food) Order 1973 (Waste Food Order), which applied across Great Britain, prohibited the farmer from allowing livestock or poultry access to the fields until enough time had passed for all blood to disappear from the ground or grass.3933 The Diseases of Animals (Waste Food) Order 1974 had a similar effect in Northern Ireland.3934 The Orders do not state, in terms, how long animals had to be kept off the fields. Interpretation of the Orders seems to have been left up to the discretion of the relevant Agriculture Departments.

The State Veterinary Service (SVS) closely monitored the practice of spreading blood on land.3935

In a letter to Mr Derek Wilson (VO) dated 5 June 1989, Dr Matthews (SVO) made it clear that he considered MAFF’s position on the practice of spreading unprocessed blood on land to be outdated, as it was based on guidelines issued in 1978:

> When blood has been used as a fertilizer, the dressed field should not be grazed for 4 months in the case of bovine/sheep blood, and 6 months in the case of pig blood. If liquid slaughterhouse waste is being spread, then it becomes more difficult to specify any time period before allowing animals access to the field. This will depend on the nature of the waste and its contents.3936

Dr Matthews went on to say that these guidelines were now inadequate ‘to deal with a practice that has become more widespread with the rising cost of disposal of waste’, but that it was all the advice that he could offer. He did not explain why he thought the guidelines were inadequate.

In September 1989, Mr Wilson visited a farm that used slaughterhouse blood as fertiliser on its fields. He described the practice to Mr Mott, the DVO:

> Blood and slaughterhouse waste have been spread on the land for about 25 years. [A] tanker (2000 gallon capacity) with a spray on the back takes liquid waste which is blood and washing water from slaughterhouse to farm daily. ‘This is usually half full’. Waste is sprayed almost every day on arable or pasture depending on time of year. I inspected one field of stubble turnips where the last waste had been sprayed on the weekend. Small clots about 1cm across with the appearance of dropped solder were apparent across the soil and vegetation surface about every 5cm. When sprayed on the grass the practice is to ‘wait for rain to wash the blood in’. The blood is never spread near standing cattle who are reported to be frightened of the spreader.3937
10.144 Mr Wilson wrote that in spring the time between applying the blood and allowing cattle to graze on the affected land was four to six weeks and that a lapse of six months was ‘unacceptable’ to the farmer. Mr Wilson concluded that the farmer ‘seems to be adopting a sensible attitude to spraying and disposal but only 4-6 weeks can, from time to time, elapse between application and grazing’ but added that the presence of rooks and seagulls feeding on the affected land ‘could act as a vehicle for the spread of rapidly transmissible disease to other farms’.3938

10.145 Mr Wilson’s report sparked an exchange of correspondence over the next few months. Mr Kevin Taylor took the view that the MAFF guidelines needed revision, and that delays of four to six months were difficult to justify on veterinary grounds, when such a quarantine period was not required for pasture in the event of a confirmed notifiable disease. He was ‘positive about the insignificance of the practice in relation to BSE’, and did not think that the Waste Food Order was being contravened, provided all of the blood had soaked into the fields before cattle were allowed to graze.3939 Mr Ray Bradley, Head of the MAFF Pathology Department, wrote:

On the basis of current evidence I would not have thought that spreading bovine blood from healthy animals on fields is a significant risk for exposing them to BSE agent in sufficient quantity to produce disease. No animals should graze fields after blood treatment until sufficient time has elapsed to ensure destruction of all known conventional pathogenic organisms and until it is no longer recognisable as blood (ie. degraded to ‘fertiliser’ status). The length of this period should be determined by someone with experience of these factors but I would not have thought it would need to be more than a few weeks.3940

10.146 When consulted on this issue, Dr Richard Kimberlin expressed his opinion that four to six months was a suitable interval to allow between spreading blood on land and allowing animals to graze on that land, to ensure that conventional pathogenic organisms were destroyed.3941 Mr Hugh Fraser of NPU thought that six months was appropriate.3942

10.147 Mr Meldrum tended to the view that, for both scientific and presentational reasons, consideration should be given to amending the Waste Food Order to prohibit the spreading of slaughterhouse waste in its raw state on farm land. On 4 December 1989 he requested Mr Taylor and his colleagues to advise him on this.3943

10.148 The Inquiry did not find any evidence of Mr Taylor’s response to Mr Meldrum on this issue. However, in a minute to Mr Lawrence dated 15 February 1991 he wrote that:

. . . the practice [of spreading unprocessed blood on land] is widespread and may have become more so. It has also been going on for a long time without, so far as I am aware, being responsible for the spread of animal disease. The emergence of BSE does not alter the situation much: there is no evidence that
the titre of infectious agent which may be present in blood is significant, and when we last checked there had been no cases of BSE on the organic farms which used blood as a fertiliser. The Waste Food Order controls seem to be effective in practice. Time intervals are not laid down between spreading and stock access, but variability is necessary to allow for variability in weather and soil conditions, and it would be difficult to make statutory provision for this.3944

Discussion

Preliminary questions

10.149 We asked ourselves two preliminary questions as a context for assessing the adequacy of the action taken in relation to BSE risks in waste material First, how apt were the existing regulatory arrangements on waste for coping with an agent like BSE? Second, what markers were put up by the various expert committees about the need to give careful attention to waste as a pathway of transmission?

1. The regulatory arrangements already in place

10.150 It is plain from the contemporary criticisms, and major reorganisation of responsibilities and powers that ensued, that at the time BSE emerged the existing arrangements covering waste disposal under the Control of Pollution Act 1974 were not working well. Discussing the disposal of solid waste, the Select Committee on the Environment in 1989 observed:

Never, in any of our enquiries into environmental problems, have we encountered such consistent and universal criticism of existing legislation and of central and local government as we have during the course of this enquiry.

10.151 The system was at the same time having to be adapted to meet EU requirements designed to ensure waste was recovered or disposed of without endangering human health or harming the environment and to apply the principle of ‘producer pays’ to disposal costs.

10.152 Thus, the task of disposing safely of BSE carcasses and SBO took place within a regulatory system that was in trouble and transition. The new legislation and responsibilities put in place to remedy matters took time to bed down. Chapter 9 in vol. 14: Responsibilities for Human and Animal Health describes the main features of the system and the major changes introduced in the regulation of water and sewerage, waste tips, waste spreading and air quality. We had the impact of this situation very much in mind when we came to consider what was and was not done about BSE waste.
2. Markers about the importance of considering waste disposal

10.153 We were struck by the absence of any overt recognition in the proceedings of either the Southwood Working Party, the Tyrrell Committee or SEAC of the variety of pathways for disease that waste disposal might present. Individual aspects were considered from time to time. These were mainly concerns about contamination from identified items such as brain and spinal cord and with items causing public questions such as blood spreading on fields. None of these bodies seems to have thought it desirable to consider the possible infectivity of air particles from open burning.

10.154 One of the Tyrrell recommendations, however, had been to review whether there were ‘hitherto unrecognised’ pathways of transmission of BSE. The multiple forms of waste disposal certainly came within this category. We discuss in vol. 7: Medicines and Cosmetics the reasons why this comprehensive overview or ‘audit’ was not carried out. So far as pathways for waste were concerned there was initial information available within MAFF that could have been tapped, although the subject clearly ran much wider. In April 1990 Mr Lawrence asked the MAFF Meat Trade Adviser Mr Rogers to prepare a list of slaughterhouse products by way of providing a ‘starting point’ for embarking on the audit exercise. Mr Rogers commented at the end of his list, which focused on products with an economic value:

> There may be a hazard from disposal of tankage material intercepted from the drainage system which in some cases years ago was disposed of with blood by spreading on land but should now be better controlled. Solids will probably go to be rendered and liquid treated in the effluent system.

10.155 This point does not seem to have been taken further. SEAC do not appear to have been aware of it, nor do they appear to have themselves raised concerns about the destinations of waste products. On the contrary, when they paid a site visit to inform themselves about slaughterhouse practices they were reassured to see that contaminating material on carcasses was being hosed off.

Relevance of existing experience in disposing of animal waste

10.156 MAFF already had well-established routines for disposing of carcasses from compulsory slaughter under the Animal Health Act. The special problems that arose in the case of BSE cases included the sheer scale of the epidemic and its widespread distribution across the UK. The shortage of incinerators to cope with soaring numbers of dead animals meant that carcasses often had to be transported long distances. It led to expedients such as open pyre burning that attracted considerable public criticism, but did have the merit of helping to deal with the problem at the time. We discuss this further below.

10.157 On the face of it there were also established routines for handling unfit meat, enforced by local authorities, that could conveniently be applied to disposing of SBO. Much unfit material removed from carcasses normally went under a movement permit system to be processed into a marketable product through ‘sterilisation’, in particular by rendering into tallow and MBM. Thus, much unfit
meat was not waste in the sense of having no further use. If, however, the material was disposed of instead of processed, it became ‘controlled’ waste that had to be disposed of at a licensed site. The system was known to have weaknesses and be open to abuse by the unscrupulous, but was considered acceptable at the time.

10.158 We discuss in volumes 5 and 6 the extent to which the human and animal SBO bans achieved their respective objectives of keeping SBO out of the human and animal food chains. Even if these objectives were fully achieved, each of the handling processes for SBO generated at various points their own volume of waste material – solids, effluent and airborne particles – that might contain the BSE agent. Like other controlled wastes, they were discharged into rivers and sewers, emitted into the air or spread on land as fertiliser. These waste disposals were governed by the patchwork of arrangements that, as we have noted above, were attracting such heavy criticism. Moreover, after the introduction of the voluntary ban on SBO in animal feed, MBM and tallow made from SBO were increasingly treated as waste, ie, a product with no beneficial use.

10.159 We can see with hindsight that the impact of BSE on the emission of waste to land, air and water needed fresh thinking. As vol. 14: Responsibilities for Human and Animal Health explains, there were a number of controls on hazardous emissions but this regulatory system was not designed to deal with potentially lethal agents that were of minute size, undetectable by standard tests and of unknown degradability. The various pathways involved and what might be done about them needed special consideration and review. This was not to happen until March 1996 when the prospect of a massive cattle slaughter programme at last brought DOE and MAFF together to discuss ‘the potential problems arising from the various disposal routes’. 3945

How MAFF handled BSE carcasses and waste

10.160 We examined what matters were in fact considered. We also looked at the separate set of concerns that arose about the practice of spreading waste blood on fields. We set out below our views on the effectiveness of the action taken and conclude with some observations about the lessons this holds for the future.

1. Carcass disposal

10.161 When the compulsory slaughter scheme came into operation, MAFF sent out detailed instructions to their field staff about disposals. They favoured incineration at VICs or the CVL as the preferred option, then, ‘in order of decreasing desirability’:

- off-farm burning on waste ground or a local authority site
- incineration on farm
- burial in a local authority tip
- burial on farm by a contractor

3945 YB96/3.27/3.2
10.162 Given the nature of the BSE agent this seemed to us the right set of priorities.

10.163 As the number of reported cases of BSE rocketed in 1989 and 1990, strenuous efforts were made by MAFF to get new incinerator capacity up and running as well as to seek other methods of disposal. They eventually got the disposals problem under control in 1992, as illustrated by the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Incineration</th>
<th>Burial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VIC On farm</td>
<td>Elsewhere On farm</td>
<td>Elsewhere</td>
</tr>
<tr>
<td>1988</td>
<td>460 57</td>
<td>887 24</td>
<td>801</td>
</tr>
<tr>
<td>1989</td>
<td>752 919</td>
<td>3,675 73</td>
<td>2,269</td>
</tr>
<tr>
<td>1990</td>
<td>1,081 1,988</td>
<td>10,616 19</td>
<td>2,703</td>
</tr>
<tr>
<td>1991</td>
<td>2,709 507</td>
<td>27,090 9</td>
<td>344</td>
</tr>
<tr>
<td>1992</td>
<td>3,036 66</td>
<td>40,345 2</td>
<td>0</td>
</tr>
</tbody>
</table>

10.164 Although, looked at from this perspective, the numbers dealt with by burial were not large, they created considerable public disquiet. While disposal in the ground was less obviously offensive to the public than burning, there were concerns about leaching from buried carcasses into water supplies, whether from farms or from local authority waste tips.

10.165 Ministers queried the wisdom of burial, as did DOE officials. As we have seen, the view of officials in MAFF was that no risk was involved. We note that this was not seen as a matter that needed to be referred to SEAC and that a study on it was not carried out until 1997. This was as part of a comprehensive ‘overview of the risks associated with BSE via environmental pathways’ commissioned by the EA from outside consultants, in the light of the volume of carcasses to be disposed of under the OTMS scheme.

10.166 DOE officials also queried the apparent inconsistency of banning burial on local authority sites of raw SBO – derived from what were only potential carriers of the disease – while permitting whole carcasses of animals actually suffering from the disease to be buried on farm or in tips. MAFF had logical answers. The heads of such animals had been removed and burnt at VICs. Burial was under veterinary supervision, or on ‘controlled waste’ licensed tips. None the less the concerns remained, and as we have seen, burning in closed incinerators, with burial only as a last resort, was throughout the MAFF goal.

10.167 Could they have achieved this goal earlier? The weakness in the MAFF approach was their consistent underestimates of the likely course of the epidemic. Thus they successively planned on the following basis:

- July 1988: 60 new cases a month. Expected to rise to 100 a month
- January 1989: 100 new cases a week, not expected to diminish till 1992
- April 1989: 130 cases a week, predicted to rise to 200 a week
- March 1991: 500 cases a week, expected to rise to 700 a week.
10.168 If the true numbers of cattle already infected had been appreciated, this might have affected some of the policy decisions taken. In the case of carcass disposal, the optimistic view of the likely future incidence of BSE meant that the extra incinerator provision they secured was repeatedly outstripped by demand. More realistic estimates might have provided a powerful trigger for a concerted plan to increase incinerator capacity more comprehensively or to establish how this might be done.

10.169 Those responsible for carcass disposal arrangements can not be blamed for proceeding on the estimates at the time which reflected the ignorance of the extent to which recycling of the disease had already taken place. In dealing with what became a Sisyphean task, the MAFF team showed commendable energy and persistence in seeking solutions.

10.170 We noted that, in the process of doing so, MAFF officials resisted DOE proposals – subsequently dropped – for a register of animal burial sites. On the face of it, this was a worthwhile proposal for protecting public health from dangerous waste. However, the purpose of the interdepartmental consultation had been to enable them to express any legitimate objections they had before a decision was taken by DOE. MAFF had real practical reasons for concern and raised these with DOE. It was entirely reasonable that they should have done so.

10.171 As regards open pyre burning, the volume was never high because of public objections, and much of it was on MOD land, well away from dwelling houses. The preferred strategy was to encourage private sector provision of closed burning. This too encountered problems. There was vigorous resistance to the grant of planning permission for incinerators, never a popular form of development among local residents. Some local authorities feared they might be left with a worrisome legacy of premises no longer needed to handle BSE carcasses. At the same time the proposed introduction of new, tighter regulations over incinerator standards threatened to reduce existing capacity for handling BSE cases and was resisted by MAFF, successfully, so far as smaller incinerators were concerned.

10.172 MAFF officials are not to be criticised for the energetic efforts they made to overcome reluctance to grant the necessary permissions for carcass disposals and new incinerators, nor for their lack of enthusiasm for new regulations and requirements that would make their task more difficult. In all these matters it seems to us that MAFF officials acted properly in laying their considerations and information in front of those responsible for decision.

10.173 These were reasonable responses in the light of the difficult and unpopular task they were having to carry out and the threat to public health if the disposal system were to break down.

2. Direct disposal of raw SBO

10.174 So far as unfit meat was concerned, it seems that this generally went off for rendering. Local Authorities were accustomed to operating a system of movement permits before unfit meat could leave the slaughterhouse or knacker’s yard, and the limited exceptions under which unfit meat could, if in a container mainly of green offal (and in the case of carcass meat or specified offal, if stained) go to the
renderers without a movement permit. They are not likely to have had experience of unfit meat going to waste tips.

10.175 The 1989 SBO regulations provided that unsterilised SBO could only be removed from a slaughterhouse under a movement permit. It would not need to be stained if it were going to excepted premises, ie:

i. A hospital, medical or veterinary school, laboratory or similar institution for instructional or diagnostic purposes or the premises of a manufacturing chemist (in circumstances where he receives the offal for the manufacture by him of pharmaceutical products); or

ii. Premises used for the manufacture of products other than food and not used for the manufacture of food.

10.176 It seems that in practice, however, confusion arose among the many local authorities operating waste tips, with some permitting raw SBO to be dumped, while others refused permission.

10.177 We considered what had led to this confusion. There appeared to be several factors. First, there were the variety of LA practices under the Control of Pollution Act. Second, the new Inspectorate of Pollution had not yet got into its stride and appeared reluctant to offer advice. Third, as noted earlier in this volume, the local authority associations had been unable to give the draft SBO Regulations much consideration in 1989 because of the heavy involvement of their limited staff with the Environmental Protection and Food Safety Bills.

10.178 We consider that once the confusion was brought to their attention, MAFF were prompt in offering definitive advice through Mr Crawford’s letter in June 1990. His advice was:

It is the clear intention of the Regulations that no raw, untreated offal to which these regulations apply should be taken to a landfill site for disposal except in an emergency. There are no such restrictions on sterilised offal.

3. Disposal after treatment

10.179 Up to 1991, as noted, SBO transformed into MBM and tallow could be disposed of either through the market, or on licensed tips like any other controlled waste, once rendered. In 1991 new secondary legislation was introduced. The final disposal of MBM from SBOs for the first time became controlled under a tighter regime than other unclassified controlled wastes. It could be sent only to premises approved under a MAFF licence. In practice, that meant an incinerator or licensed waste tip though some permits were granted for temporary storage in warehouses.

4. Wastes produced during separation and treatment of SBO

10.180 This was the aspect of waste disposal that received the least scrutiny in relation to the new problems posed by BSE. Only in 1996 did it begin to receive detailed consideration.3946
At the time that it was decided that SBO should not be permitted in human food, it was to be expected that in slaughterhouses, knacker’s yards and other premises where cattle were killed, waste contaminated with SBO would be passing down drains as effluent, ending up in sewers or rivers. Slaughterhouse or rendering plant waste, or sewage sludge from works handling their effluents, might all lawfully be spread as fertiliser on land where animals subsequently grazed or crops were grown. This was seen as having a positive recycling and ecological value.

Following the voluntary ban on SBO in animal feed, the number of plants willing to render SBO into MBM and tallow steadily decreased. It could be expected that the raw material handled by these plants would include a significant amount of tissue which had come from cattle incubating BSE. Concerns surfaced in 1996 in terms of occupational risk from inhaled dust at the four plants dedicated to SBO rendering. The Advisory Committee on Dangerous Pathogens stated in April 1996 that they considered that TSEs ‘including BSE, are not transmissable by aerosols or fine dust particles’. This was a point of significance to those who later were concerned about dust emanating from vehicles transporting waste MBM and the buildings where it was stored.

What could have been done differently?

Although much of the evidence of the concerns raised over the BSE risk from effluent from Thruxted Mill relates to a time outside the period of this Inquiry, we thought these concerns and the action taken in response to them illustrated some of the difficulties that arise in dealing with secondary wastes. Appropriate tests and studies of BSE in effluent would have had application to all rendering plants and any desirable precautions could have been taken. Similar issues apply to slaughterhouses, head-boning plants and knacker’s yards. Concerns over BSE risk from effluent could usefully have been considered, and perhaps resolved, much earlier for the benefit of all.

Who could have taken the lead?

We asked ourselves who might have taken this initiative. Prior to the establishment of the Environment Agency, the DOE was an obvious candidate. However, as noted above, MAFF did not inform them of the features of the BSE agent that might require a fresh look at the capability of the existing regulatory system to handle it.

We do not underestimate how difficult a task it would have been, involving so many agencies and with so many unknowns. The 1997 work shows what careful scrutiny is involved and the wide variety of interested parties. It was outside our remit to review how that was followed up. An examination of this sort, conducted earlier, could have considered whether, as a matter of practicality, because of the special characteristics of BSE, waste risk material should be dealt with at source as far as possible. This would probably have required new procedures. The fate of solid waste and effluent from certain processes such as head-splitting and brain-removal would have needed particularly careful consideration.
Dilution and degradation of harmful agents were both key features of minimising risks to public health and the environment. In the case of BSE questions arose as to the extent of dilution and degradation. Waste disposal authorities had a particular need to be well informed about ways of inactivating the agent and whether repeated exposure to small amounts might have a cumulative effect. They had a shared interest in research on these matters, both of which remain unresolved today.

At the beginning of this discussion we noted that no overview of risk from waste disposal practices appears to have been asked for or attempted by the Southwood Working Party, the Tyrrell Committee and SEAC. All of them, however, advocated a systematic review of the destination of all bovine materials. Had this been carried out, it might have been expected to identify many of the matters covered in this chapter and where more research or development of new techniques were needed. It would also have revealed the need for MAFF to carry out its risk management on a much wider canvas than its veterinary interests.

As it was, we saw little or no consideration of the issues BSE posed for the existing regime over waste disposal.

**Spreading of blood and slaughterhouse waste**

The only such area that received some sustained consideration by MAFF and led them to consult SEAC was the practice of spreading blood and other slaughterhouse waste on fields. Partly driven by media interest, this was the cause of some concern within MAFF and led them to question the existing guidance to farmers. However, as noted in vol. 11: *Scientists after Southwood*, SEAC did not consider that blood carried an infective risk when they reviewed it in 1991.

During the period to 20 March 1996 SEAC were not asked to consider the agricultural use of waste from rendering plants. This practice, which involved ‘beneficial use’ of the material in agriculture meant that it was not treated as controlled waste and was in effect subject to no control or regulation. This was a matter we did not have time to explore in our inquiry. However, *prima facie*, with an agent such as BSE, it would appear desirable to establish whether such material contains the BSE agent, whether its spreading poses any risk to animals or humans thereafter and to impose consistent controls.

**Lessons from these aspects of BSE**

These aspects of the BSE story demonstrate some lessons:

- We think the most important lesson for the future is that identification of pathways along which a transmissible agent might pass should always include waste. This might take many, not all immediately obvious, forms and require diligent tracing through a series of stages. This is likely to require a special exercise carried out on a much wider basis than the sphere of individual Departments.

- A problem in responding to BSE was the complex and disjointed swathe of arrangements covering land, water and air waste disposal and
pollution. Even had a comprehensive overview identified the many waste pathways that needed to be considered, there would have been problems in developing an integrated policy approach. Matters have been improved through the creation of the Environment Agency. If this has not yet been done, it would be helpful to establish a clear lead role, similar to that exercised by the HSE on occupational risk, for the issue of consistent advice and guidance to those encountering new types of hazardous, or potentially hazardous, animal waste material.

- It might have been appropriate to consider into which category waste from potentially infective animal tissues might fall. There needs to be a clear mechanism for determining whether particular types of material should be allocated to the ‘special’ or ‘hazardous’ waste categories, thus triggering appropriate disposal arrangements. This applies also to cases where, as with BSE, the hazard is potential rather than proven. These are matters on which it would seem wise to clarify general principles and their application in advance of, rather than in the course of, any new threat.

- We found it difficult to distinguish between ‘agricultural’ and ‘controlled’ waste in respect of the risks posed by BSE. We were concerned that rendered material spread for agricultural purposes is not apparently a ‘controlled waste’, as it is in beneficial use, nor is it apparently covered by the provisions concerning rendered SBO material. Suspect tissues and processed materials need consistent consideration and criteria. Where subsequent action differs, it should be on the basis of reasoned analysis.

- We thought that the practice of spreading slaughterhouse and rendering waste on fields, while consistent with notions of recycling, none the less needs review. This would help ensure consistent precautionary procedures and guidance across the UK as a whole against the spread of animal disease or risk to humans.

- In the programme of BSE research, work on transmissibility through wastes was notable by its absence. Consistently, with what we have said above, the need for research on this aspect should be given careful consideration, both in relation to BSE and in the event of any future threat of this nature.

- Major changes have taken place in the structure of the waste recycling and disposal system as a result of BSE, in particular the virtual disappearance of knackers for handling fallen stock and the changed nature of the rendering industry. It would be desirable to review the efficacy of the arrangements today and the incentives they provide for the safe disposal of risk material.

- In considering ways to make the national system of animal disease surveillance and control more effective, as recommended in vol. 2: *Science*, new links between the notification status of disease and associated waste disposal procedures might usefully be explored.