

SELECT COMMITTEE ON
ANIMALS IN SCIENTIFIC
PROCEDURES

VOLUME I—REPORT

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CONTENTS

	<i>Paragraph</i>	<i>Page</i>
PREFACE		4
SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS		6
CONCLUSIONS		6
RECOMMENDATIONS		6
CHAPTER 1: INTRODUCTION	1.1	4
Legislation in the United Kingdom	1.1	4
Trends in animal use	1.6	4
The Three Rs	1.12	4
Comparison to other regulatory systems	1.14	4
Regulation in the United States	1.17	4
Regulation in France	1.23	4
Regulation in Japan	1.28	4
Issues raised	1.29	4
CHAPTER 2: ETHICS	2.1	4
CHAPTER 3: THE PURPOSE AND NATURE OF ANIMAL EXPERIMENTS	3.1	4
Types of animal experiments	3.4	4
Non-laboratory animal research	3.11	4
Defence research	3.18	4
Government funded research abroad	3.25	4
CHAPTER 4: THE EFFICACY OF ANIMAL EXPERIMENTS	4.1	4
Fundamental and applied research	4.2	4
Toxicological research	4.16	4
The development of non-animal toxicological tests	4.26	4
Toxicology and the law	4.34	4
Potential of developing technologies	4.46	4
CHAPTER 5: REGULATION AND THE ANIMALS (SCIENTIFIC PROCEDURES) ACT 1986	5.1	4
The Inspectorate	5.5	4
Weighing of harms and benefits	5.19	4
Licence applications and bureaucracy	5.28	4
Training modules	5.42	4
The Animal Procedures Committee	5.48	4
CHAPTER 6: THE ETHICAL REVIEW PROCESS	6.1	4
Role of the ERP	6.6	4
Membership of the ERP	6.17	4
CHAPTER 7: THE THREE RS: ALTERNATIVES TO ANIMAL EXPERIMENTS	7.1	4
Use and development of the Three Rs	7.10	4
Centre for the Three Rs	7.17	4
Other ways to promote the Three Rs	7.27	4
CHAPTER 8: GENETICALLY MODIFIED ANIMALS	8.1	4
CHAPTER 9: PUBLIC INFORMATION	9.1	4
Section 24	9.11	4
A new discussion forum	9.19	4
Product labelling	9.23	4
Statistics of Scientific Procedures on Living Animals, Great Britain	9.26	4
Appendix 1: Membership and Declarations of Interest		4
Appendix 2: Terms of Reference		4
Appendix 3: Committee Visits		4
Appendix 4: Conference Proceedings, 21 May 2002		4
Appendix 5: List of Witnesses		4
Appendix 6: Glossary		4
Table: Project licences in force on 31/12/2000		4

Note

The evidence received by the Committee is published in two separate volumes—Volume II: Oral Evidence (HL 150-II) and Volume III: Written Evidence (HL 150-III).

In the text of the report:

- Q. refers to a question in the oral evidence;
- p. refers to a page in the written evidence; and
- para. refers to a paragraph number in this report.

REPORT

16 JULY 2002

By the Select Committee on Animals in Scientific Procedures

ORDERED TO REPORT

ANIMALS IN SCIENTIFIC PROCEDURES

PREFACE

The Select Committee on Animals in Scientific Procedures was appointed by the House of Lords in March 2001 to conduct an inquiry into the use of animals in scientific procedures in the United Kingdom. Following the dissolution of Parliament, the Committee was reappointed in June 2001. The membership of the Committee, together with their declarations of interest, is given in Appendix 1. The Committee's terms of reference are given in Appendix 2.

The Committee issued a call for evidence in April 2001, to which over 100 organisations and over 350 individuals responded with written submissions.¹ The Committee also took oral evidence from nearly 40 organisations and individuals between May 2001 and May 2002.² In addition, the Committee visited universities, pharmaceutical and testing companies and research laboratories in England, Scotland, France and the USA.³ Towards the end of its deliberations, the Committee convened a one-day conference of interested parties concerned with animal experiments. These included participants from the science community, industry, regulators and animal welfare and animal rights organisations.⁴ We are grateful to all those who presented written or oral evidence, and to those who hosted Committee visits in the USA, France, and here in the UK. We are also grateful to our Specialist Adviser, the Reverend Professor Michael Reiss.

Animal experimentation is a subject under almost constant review. During the course of the Inquiry, reports relevant to animal experimentation have appeared from the Home Office, the Animal Procedures Committee, the Boyd Group, the European Union Committee of the House of Lords, the Royal Society, the British Union for the Abolition of Vivisection and many others. Further reports are expected shortly from the Agriculture and Environment Biotechnology Commission and from the Animal Procedures Committee. Developments have also taken place in Europe, from the granting of legal rights to animals in Germany, to the progress of legislation on animal testing and cosmetics in the European Parliament. In this context, and particularly in areas of rapid technological change such as the genetic modification of animals, we expect that further reports will become necessary over the next few years.

On the basis of our review of the evidence and of the public debate about animal experiments, we have come to a number of conclusions about the current relationship between human beings and other animals in the context of the Animals (Scientific Procedures) Act 1986. The evidence shows that this relationship is not fixed, but has evolved under the influence of modern technological and scientific developments and our growing understanding of animal cognition and suffering. Nevertheless, we conclude that changes are needed in the institutional arrangements, in the information which is made available, and in the attitudes shown by all concerned, from the specialist to the public. These developments should contribute to an improved framework for balancing the legitimate requirements of science and the care and welfare of animals.

¹ These are published in the volume of written evidence (HL 150–III).

² This is published in the volume of oral evidence (HL 150–II).

³ A record of the Committee's visits is found in Appendix 3.

⁴ The record of the conference is found in Appendix 4.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The view of the Select Committee is that it is morally acceptable for human beings to use other animals, but that it is morally wrong to cause them unnecessary or avoidable suffering. (paragraph 2.5)
2. There is at present a continued need for animal experiments both in applied research and in research aimed purely at extending knowledge. (paragraph 4.14)
3. Toxicological testing in animals is at present essential for medical practice and the protection of consumers and the environment, as it often provides information that is not currently available from any other source. (paragraph 4.25)
4. The UK should strive not for the tightest regulation, but for the best regulation, properly enforced. (paragraph 5.33)
5. The availability to the public of regularly updated, good quality information on what animal experiments are done and why, is vital to create an atmosphere in which the issue of animal experimentation can be discussed productively. (paragraph 9.1)
6. There is scope for the scientific community to give a greater priority to the development of non-animal methods, and more consideration could be given to the pursuit of the Three Rs — reduction, refinement and replacement. (paragraph 4.15)
7. The development of scientifically valid non-animal systems of research and testing is important, not just to improve animal welfare, but to provide substantial benefits for human health. (paragraph 4.33)

RECOMMENDATIONS

Chapter 3: The Purpose and Nature of Animal Experiments

8. The Animal Procedures Committee should invite submissions from the Royal College of Veterinary Surgeons, the Farm Animal Welfare Council and others to establish the appropriate application of the 1986 Act or the modification of its regulations for experimental farm animals. (paragraph 3.17)
9. Government funded research or training using animals abroad should be consistent with the requirements of the 1986 Act. (paragraph 3.26)

Chapter 4: The Efficacy of Animal Experiments

10. The Government should take greater steps to promote the adoption of replacements and the incorporation of refinements into animal test guidelines issued by the International Conference on Harmonisation and the Organisation for Economic Co-operation and Development. (paragraph 4.40)
11. The Government and the scientific community should engage in a systematic and visible search for methods involving the Three Rs in toxicology. The Government should nominate one department to take the lead on this. (paragraph 4.44)
12. The UK Government should use their influence to urge the EU to make the development and validation of replacements for animal experiments a priority, particularly in toxicology. (paragraph 4.45)
13. The promotion of the commercial advantages of the Three Rs needs a clear lead from a nominated department within Government. (paragraph 4.49)

Chapter 5: Regulation and the Animals (Scientific Procedures) Act 1986

The Inspectorate

14. The Home Office Inspectorate should be subject to periodic review, by a body other than the Inspectorate itself. (paragraph 5.13)

15. Designated establishments should be inspected at least once a year by an Inspector from another area. (paragraph 5.17)

Weighing of harms and benefits

16. The substantive details of anonymised project licences, which describe the expected benefits of the research and harms to the animals involved, should be made public *after* they have been approved and funded. (paragraph 5.24)
17. The current restrictions on the use of terminally anaesthetised animals for training surgeons should be relaxed. (paragraph 5.27)

Licence applications and bureaucracy

18. Urgent consideration should be given by the Home Office to the simplification of project licences, with the aim of reducing the length of a typical licence to 10 pages. (paragraph 5.40)

Training modules

19. Visiting scientists and students in higher education should be allowed to carry out work under the licences of an established licence-holder, who would take responsibility for their actions and for the maintenance of animal welfare. (paragraph 5.46)
20. Scientists of whatever grade should have a personal responsibility for the welfare of animals in their care. (paragraph 5.47)

The Animal Procedures Committee

21. The secretariat of the Animal Procedures Committee should be strengthened and more clearly separated from the Home Office regulators. (paragraph 5.52)

Chapter 6: The Ethical Review Process

22. The Home Office should delegate interim authority to the local Ethical Review Process to approve routine or minor amendments. (paragraph 6.11)
23. Each Ethical Review Process should be required to have an external, lay member, whose term of office should be time-limited. (paragraph 6.21)

Chapter 7: The Three Rs: Alternatives to Animal Experiments

24. A Centre for the Three Rs should be set up, consisting of a small, administrative hub which co-ordinates research units embedded in existing centres of scientific excellence. (paragraph 7.18)
25. The current Animal Procedures Committee research budget of £280,000 should be given to the Centre to disburse. The Centre should co-ordinate the Government spend on the Three Rs across all departments. A Centre would also require further funding from Government, industry, and animal welfare charities. (paragraph 7.23)

Chapter 8: Genetically Modified Animals

26. A welfare assessment of all new strains of animals used in experiments (whether produced by new technologies or by more traditional methods) should be made as a matter of course. (paragraph 8.12)
27. Animals from genetically modified strains which are bred but not otherwise used in regulated procedures should be excluded from the Home Office *Statistics*, provided that they have no characteristics with adverse welfare implications. (paragraph 8.16)

Chapter 9: Public Information

28. Section 24 of the 1986 Act (the “confidentiality clause”) should be repealed. Specific justification should then be made for each class of information that needs to be kept confidential, such as the identity of researchers and matters of commercial confidentiality and intellectual property. (paragraph 9.18)

29. The Inspectorate should convene a regular forum to discuss specific scientific and welfare issues related to the use of animals in experiments. (paragraph 9.22)
30. A formal consultation on the *Statistics* should be carried out with a view to making them easier to interpret. (paragraph 9.29)
31. Serious efforts should be made to provide better statistics on animal suffering. The Home Office Inspectorate should develop or approve a “scoring system” for animal suffering which could be operated by Named Animal Care and Welfare Officers and Named Veterinary Surgeons, and used to provide data for the *Statistics*. (paragraph 9.38)

CHAPTER 1: INTRODUCTION

Legislation in the United Kingdom

- 1.1 During the eighteenth and nineteenth centuries, a number of pieces of legislation relating to animal treatment were passed in the UK. In 1781 the statutory surveillance of the treatment of cattle at Smithfield was introduced and this was soon followed by the licensing of slaughterhouses with attention being paid to humane killing methods. In 1822 a Bill was passed which stated that “if any person or persons having the charge, care or custody of any horse, cow, ox, heifer, steer, sheep or other cattle, the property of any other person or persons, shall wantonly beat, abuse or ill-treat any such animal, such individuals shall be brought before a Justice of the Peace or other magistrate”.
- 1.2 Many other anti-cruelty Acts followed including the 1876 Cruelty to Animals Act and the 1911 Protection of Animals Act. The 1876 Act regulated vivisection and introduced a licensing and inspection system. The 1911 Act made it an offence to “cruelly beat, kick, ill-treat, over-drive, over-ride, overload, torture, infuriate or terrify any animal”. It also forbade the causing of unnecessary suffering, but with certain categories of exemptions, one of which was vivisection.
- 1.3 The 1876 Act remained in force in the regulation of animal experiments until 1986. Since then, animal procedures in the UK have been regulated under the Animals (Scientific Procedures) Act. Some of the principal features of the Act are set out below:
- (i) the Act covers all non-human vertebrates and the common octopus (*Octopus vulgaris*). Mammals, birds, reptiles, amphibians and fish are protected, while invertebrate creatures such as squid, insects and protozoa are excluded;⁵
 - (ii) the Act regulates any experimental or scientific procedure which may have the effect of causing a protected animal “pain, suffering, distress or lasting harm”;⁶
 - (iii) the Act requires that all regulated procedures are carried out under three licences: a personal licence for the scientific investigator; a licence for the establishment where the procedure is to take place; and a project licence which details the numbers and types of animals to be used, the exact procedures to be performed, and the overall purpose of the project;⁷
 - (iv) the key element of the Act is commonly known as the cost/benefit analysis. This is applied to all proposed animal research in a project licence, and is defined as the weighing of “the likely adverse effects on the animals concerned against the benefit likely to accrue”.⁸ The analysis, and hence the decision whether to grant a licence or not, is made by the Secretary of State on the advice of the Inspectorate;
 - (v) in addition, a project licence should not be granted if there is a “reasonably practicable method not entailing the use of protected animals”, that is, an animal experiment should not be licensed if there is a realistic non-animal method.⁹ Where animals are used, the procedures must use “the minimum number of animals, involve animals with the lowest degree of neurophysiological sensitivity, cause the least pain, suffering distress or lasting harm, and are most likely to produce satisfactory results”;¹⁰
 - (vi) there is an Inspectorate, whose members advise on the granting of licences and carry out inspections of designated establishments.¹¹ The Inspectorate currently make some 2,100 visits each year, of which about two thirds are unannounced (Q. 130);
 - (vii) an independent committee, the Animal Procedures Committee (APC), advises the Secretary of State on the operation of the Act.¹² The APC currently has 22 members, and includes a barrister, philosophers and representatives from industry, academia, funding bodies, and animal welfare and anti-vivisection groups.¹³ The APC considers

⁵ Section 1(1) of the 1986 Act. In this report “animal” refers to an animal protected under the Act.

⁶ Section 2(1).

⁷ Sections 3–8.

⁸ Section 5(4).

⁹ Section 5(5)(a).

¹⁰ Section 5(5)(b).

¹¹ Section 18.

¹² Section 19.

¹³ In this report we distinguish between broadly different points of view, although we recognise that these categories are not discrete. “Animal rights groups” consider that animals have intrinsic rights which preclude their use by humans, such that all animal experiments should immediately be discontinued. “Animal welfare groups” may or may not accept the need for animal

some of the most controversial project licence applications, such as the use of non-human primates in procedures of substantial severity, and the use of animals to practise microsurgery.¹⁴ In its deliberations, the APC is enjoined to have regard “both to the legitimate requirements of science and industry and to the protection of animals against avoidable suffering and unnecessary use in scientific procedures”.¹⁵ The APC publishes an annual report which is laid before Parliament;¹⁶

- (viii) *Statistics of Scientific Procedures on Living Animals* (the *Statistics*) for Great Britain are published annually by the Home Office. Equivalent statistics for Northern Ireland are published annually by the Department of Health, Social Services and Public Safety;¹⁷
 - (ix) Section 24 of the Act prevents the Inspectorate, or any other official who receives confidential information in the course of carrying out duties under the Act, from disclosing that information. In practice, this means that there is no requirement for the details of any animal procedure to be made public. The Inspectorate are also prohibited from making public details of any breaches of the Act, although a summary of infringements is included with the annual *Statistics*.
- 1.4 Subsequent to the passing of the 1986 Act there have been a number of developments with regard to its implementation. In its 1996 annual report, presented to the incoming government in August 1997, the APC published an interim review of the operation of the Act. It concluded that the Act did not require radical reform but recommended a number of changes so as, *inter alia*, to help the Inspectorate and give the public a better understanding of the cost/benefit assessment; to document the consideration of non-animal methods in project licences; to provide appropriate training for those involved in the killing of animals; to publicise how infringements of the Act are handled by the Home Office; and to increase the size of the Inspectorate and its administrative support. The Government accepted these and other recommendations: some have already been implemented; others await implementation.
- 1.5 Since the 1997 review by the APC, a number of other regulatory developments have taken place, including:
- a ban on the testing of finished cosmetic products on animals (6 November 1997);
 - a ban on the use of great apes (6 November 1997) – though none had in fact been used since the passing of the 1986 Act;
 - a ban on the testing of alcohol and tobacco products on animals (6 November 1997);
 - a *de facto* ban on the testing of cosmetic ingredients (16 November 1998);
 - a ban on the use of animals to produce monoclonal antibodies by the ascites method, save in exceptional cases (from 1 January 1999),¹⁸
 - the introduction of the Ethical Review Process (ERP) (from 1 April 1999);
 - a ban on the acute oral Lethal Dose 50% (LD50) test (OECD test guideline 401) save in exceptional circumstances (21 October 1999),¹⁹ and
 - a change in the balance of membership of the APC intended to ensure its greater independence.

experiments, but, regardless of their ultimate aims, accept the position that animals are likely to be used in scientific procedures for the time being, so efforts should be concentrated on minimising the number of animals used, and improving the welfare of those that are used. “Anti-vivisectionists” are those who are opposed to all animal experiments — this group encompasses all animal rights groups and some, but not all, animal welfare groups. For further discussion, see Professor Stephen Clark, “Thinking about biotechnology: towards a theory of just experimentation” (p. 111).

¹⁴ The use of animals to develop other surgical skills has been prohibited since 1987.

¹⁵ Section 20(2).

¹⁶ Section 20(5).

¹⁷ Section 21(7).

¹⁸ The ascites method involves the injection of a severe irritant and hybridoma cells (cells cloned from the fusion of a cancerous cell with a healthy antibody-producing cell) into the body cavity of a mouse or rat. Large amounts of monoclonal antibody-rich fluid are produced and this is collected. However, the procedure is widely agreed to cause considerable suffering.

¹⁹ The LD50 test was devised in 1927 to assess the acute oral toxicity of substances. It involves feeding increasing doses of a test substance to animals to discover what dose kills 50% of them within a given time. There is no limit either to the number of animals used, or to the quantity of the dose. This has now been substantially replaced by the Fixed Dose Procedure which uses approximately one quarter of the animals required by the LD50 and reduces the severity of the test. The LD50 test is still occasionally used, for example by the Ministry of Defence (MOD), but its use is subject to special justification (see Q. 1583 and paras 2–3 of the memorandum supplementary to the MOD’s oral evidence).

Trends in animal use

- 1.6 The official annual publication of statistics on the use of animals in Great Britain is based on the detailed forms returned by project licence holders at the end of each year, or on termination of their licence.²⁰ The forms collect a large amount of data including:
- species used;
 - number of procedures carried out and number of animals used. On the relatively small number of occasions where an animal is used for two or more procedures, 2.7% of occasions in 2000, each procedure is counted separately – so that the number of animals used each year is slightly less than the reported number of procedures;
 - primary purpose, classified as one of: fundamental biological research; applied studies (human medicine or dentistry, and veterinary medicine); protection of man, animals or the environment by toxicological or other safety or environmental evaluation; education and training; forensic enquiries; direct diagnosis; and breeding;
 - source of animals;
 - stage of development, genetic status, and breeding (including all genetically modified animals); and
 - target body system (e.g. nervous system, multiple systems).
- 1.7 The most recent Home Office report was published in 2001 and relates to the year 2000. It shows that there has been a significant downward trend in the number of animals used in the UK over the last 25 years, so that the number now is only just over half of what it was then. However, in 2000 the number of animal procedures increased, compared to the previous year, by 58,000 (2.2%) to 2.71 million. This increase is due to the number of genetically modified (“GM”) animals counted solely because of the genetically modified status, even though many of these GM animals are not actually used in any scientific experiment.²¹ Without the inclusion of these GM animals, the number of animal procedures in 2000 would have decreased, compared to the total the previous year, by approximately 15%.
- 1.8 The creation and use of GM animals continues to increase. In Great Britain in 2000 there were 581,740 procedures in which GM animals were used or bred, 14% more than in 1999. Around 99% of these were on mice. The number of scientific procedures involving GM animals, which would be classified as scientific procedures under the Act if normal, non-GM animals had been used, was 118,551.²²
- 1.9 Most procedures are carried out on mice (59%), followed by those on rats (20%), fish (9%), birds (4.5%), guinea pigs (2%), ungulates (hooved mammals) (2%) and rabbits (1.5%). Other figures include dogs (0.3%), non-human primates (0.13%) and cats (0.07%).
- 1.10 Most procedures are carried out for the purposes of fundamental biological research (32%), applied human medicine (27%) and breeding (26%). Applied veterinary medicine comprised 7% of procedures, and protection of man, animals or the environment 6%.
- 1.11 Action on 39 infringements was completed in 2000, compared to 28 in 1999 — a summary of information on infringements is included with the annual *Statistics*.²³

The Three Rs

- 1.12 In 1959, two British scientists, the zoologist William Russell and the microbiologist Rex Burch, published *The principles of humane experimental technique*, a study of the ethical aspects of animal research commissioned by the Universities Federation for Animal Welfare

²⁰ Home Office *Statistics of Scientific Procedures on Living Animals*, Great Britain, 2000. These statistics, published by the Home Office, apply only to Great Britain. Statistics for Northern Ireland are collected and published along similar lines by the Department of Health, Social Services and Public Safety. In Northern Ireland in 2000 14,124 animals were used, a fall of 1% since 1999, though the number of procedures increased by 1%. Nearly 60% of animals used were rats and mice, and no procedures were carried out on primates. There were 13 licensed establishments, which received a total of 157 visits from the Northern Ireland Inspectorate.

²¹ See Chapter 8, Genetically Modified Animals.

²² See Table 3.3 of the *Statistics*. This figure includes procedures classified as: “Generation of founder animals”, “Used in further regulated procedures”, “Used in production and other procedures” and “Used in safety evaluation studies”.

²³ See pp. 96–97 of the *Statistics*. Currently, only the number of infringements is reported, together with a short commentary on the types of infringements encountered. Some infringements are technical and have no impact on animal welfare, others are more serious. From next year infringements will be divided into three categories to provide a clearer indication of the severity of the infringements.

(UFAW). They said that all animal experiments should incorporate, so far as is possible, the Three Rs: replacement, reduction and refinement. They have been defined as:²⁴

Replacement of conscious, living vertebrates by non-sentient alternatives;

Reduction in the number of animals needed to obtain information of a given amount and precision; and

Refinement of procedures to reduce to a minimum the incidence or severity of suffering experienced by those animals which have to be used.

- 1.13 The Three Rs are widely accepted by the international scientific community — almost all those who use animals have said in evidence that they agree with the principle that reduction, refinement, and replacement should take place wherever possible. Many of those who disagree with the use of animals in scientific procedures also agree with the principle of the Three Rs, but are concerned that they are not always implemented. Some anti-vivisectionists dispute the Three Rs concept on the basis that both reduction and refinement tacitly acknowledge that animals should continue to be used. Dr James Kirkwood, giving evidence with UFAW, considered that refinement tended to be overlooked, and that better use could be made of research into animal cognition.²⁵ Dr Alan Goldberg, from Johns Hopkins University, said that he preferred the term “humane science” (Q. 1516). Despite these various reservations, the Three Rs have had an international impact on the debate surrounding animal experiments. We discuss the Three Rs in greater detail in Chapter 7.

Comparison to other regulatory systems

- 1.14 During the course of the Inquiry, the Committee heard oral evidence about the regulatory system in France, Japan and the United States, and also visited France and the United States.²⁶
- 1.15 Virtually all witnesses agreed that the UK has the tightest system of regulation in the world. Not only does the 1986 Act require personal, institutional, and project licences, but the UK is the only country to require an explicit cost/benefit assessment of every application to conduct animal research.²⁷ All experimental protocols are reviewed both by the local Ethical Review Process and by the Inspectorate. All establishments are subject to frequent inspection. In Great Britain, there are currently 25 Inspectors (Q. 1869), who inspect over 250 establishments.²⁸ An average facility would be visited about 4 times per year (Q. 1890). The number of inspectors is due to increase to 33 over the next two years.
- 1.16 Inspectors in the UK deal exclusively with animals used in scientific procedures, and have considerable expertise in laboratory animal science. In both the US and in France, inspectors are generalist veterinarians who are responsible for animals on commercial farms and in zoos and circuses, and may have little direct expertise in laboratory animal science.

Regulation in the United States

- 1.17 Animal procedures in the United States are regulated in three ways.²⁹ First, the Animal Welfare Act (1966 as amended), which is enforced by the Animal and Plant Health Inspection Service of the United States Department of Agriculture (USDA). Following an amendment passed in May 2002, the Animal Welfare Act no longer covers procedures on rats, mice and birds. All other warm-blooded animals are covered. The Animal Welfare Act also requires that each institution has an Institutional Animal Care and Use Committee (IACUC) which is responsible for the day-to-day enforcement of the Act. Institutions are subject to twice-yearly unannounced visits by the USDA Inspectorate, who have the power to impose fines. There are 96 USDA Inspectors to monitor around 8,800 institutions.

²⁴ Grayson, L., *Animals in Research: For and Against* (London: British Library, 2000), p. 204.

²⁵ Qs 615–17. See also para. 3.3.

²⁶ Written evidence was also received from the British Embassy, Bonn, about regulation in Germany. We note that a proposal to incorporate animal welfare into the Basic Law was recently approved by both Houses of the German parliament (p. 47 and p. 359).

²⁷ For further details on the international comparison of regulatory systems, see written memorandum by the Research Defence Society paras. 5–7. See also the European Science Foundation Policy Briefing 15, “The use of animals in research” (August, 2001), available at www.esf.org/publication/115/ESP15.pdf (July 2002).

²⁸ The number of certificates of designation in force in Great Britain on 31st December 2000 was 258 (see the *Statistics*, p. 96). The Animals (Scientific Procedures) Act 1986 applies to the whole of the UK. The regulation of the Act in Northern Ireland, including inspection and the gathering of statistics, is devolved to the Department of Health, Social Services and Public Safety.

²⁹ See the transcript of the meeting on 4th July 2001, and the note on the visit to the United States in Appendix 3.

- 1.18 Second, the Public Health Service Policy on Humane Care and Use of Laboratory Animals, given statutory mandate by the Health Research Extension Act 1985. This is enforced by the Office of Laboratory Animal Welfare (OLAW). This applies to any experimenter or institution which is in receipt of federal funds, and which uses any vertebrate (including rats, mice and birds). This Act also requires each institution to have an IACUC. OLAW enforces the standards set out in the *Guide for the Care and Use of Laboratory Animals* published by the Institute for Laboratory Animal Research. This system was described to us by OLAW as “enforced self-regulation”: institutions have to deposit a “written assurance” of compliance, but inspections are only carried out “for cause”, that is, when there is specific reason to believe that animal welfare has been compromised. OLAW has the power to withhold federal funding.
- 1.19 Third, most large companies and major universities receive accreditation from AAALAC (Association for Assessment and Accreditation of Laboratory Animal Care). AAALAC is a non-governmental, not-for-profit association, which accredits over 600 institutions in 18 countries, including four in the UK. Standards are high, but accreditation is voluntary. The system works largely by self-evaluation and peer review. Inspections by AAALAC occur once every three years, with prior notice. The sanction is loss of accreditation, and we were told that this would affect the institution’s ability to attract work and research funding.
- 1.20 The effect of this complex system of regulation is that some institutions are inspected by three bodies, while others (those which are privately funded, use only rats, mice and birds, and choose not to apply for AAALAC accreditation) are subject to no federal regulation at all. The number of animal procedures not covered by regulation is difficult to quantify.
- 1.21 The success of the regulation is also reliant on the effectiveness of the local Institutional Animal Care and Use Committee. These committees approve proposals for animal experiments and monitor animal welfare standards. They are required to have a lay member, external to the organisation, who represents the local community.³⁰ Some of these committees are undoubtedly excellent, but recent research has shown that they are not consistent in their assessment of whether a protocol should be permitted.³¹ These committees are similar to the Ethical Review Process in the UK, except that they are concerned with “Animal Care and Use”, not ethics. Only once during our visit to the US was it suggested that the IACUC should consider ethical aspects of experimentation.³²
- 1.22 Conversely, animal rights groups note that much more information about individual animal procedures is available in the US than in the UK. Information on particular procedures and inspections is placed on the internet, although this is also now subject to review because of the violent activities of some animal rights groups.³³

Regulation in France

- 1.23 Animal procedures in France are subject to the same European legislation as applies in the UK, Directive 86/609/EEC.³⁴ The French Ministry of Agriculture is responsible for the law which is enforced by the decentralised Veterinary Service.³⁵ The main controls are the institutional and personal licences.³⁶
- 1.24 An institutional licence is granted following an inspection of the premises and lasts for 5 years. In addition to giving details of housing facilities for the animals, it must state the reason for the use of animals but only in very broad terms, for example, “To prove the safety and efficacy of new drugs”.
- 1.25 A Personal Licence is granted following the receipt of the relevant application form — there is no formal interview or visit by the Veterinary Service. Personal Licences, which include outline details of proposed protocols (akin to the Project Licence in the UK), are usually less

³⁰ In the UK, Ethical Review Process committees are encouraged, but are not required, to have a lay member. We discuss this further in Chapter 6.

³¹ Scott Plous and Harold Herzog, ‘Reliability of Protocol Reviews for Animal Research’, *Science* 293 (27th July 2001), pp. 608–09.

³² This occurred during our visit to Huntingdon Life Sciences in New Jersey. We consider that this is a good example of how regulation in the UK can even have a positive impact on animal welfare in other jurisdictions.

³³ See, for example, *Nature*, 415, 14 February 2002, p. 723.

³⁴ This regulates, among other things, care and accommodation standards for animals, personal and institutional licences, training, and the requirement to publish statistics on animal use.

³⁵ See also the transcript of the meeting on 4th July 2001, and the note on the visit to Paris in Appendix 3.

³⁶ Two institutions in France also receive AAALAC accreditation.

than 10 pages long. They are usually approved within a month, and often within 2 weeks. Students do not need licences, but train under the direction of a licensed Professor.

- 1.26 Under this system, each researcher is responsible for the suitability of protocols, but protocols are not specified on the licence. The Veterinary Inspectors considered that this made it difficult for them to assess whether replacement, reduction and refinement methods were seriously considered. Recently, non-compulsory ethics committees have begun to be introduced which discuss individual protocols and give consideration to the Three Rs.
- 1.27 In France, there is at least one Veterinary Inspector in each Département. In the Paris area there are three Inspectors, two of whom work part-time, who monitor 150 institutions and over 1,500 licensed scientists. We were told that this makes the enforcement of care and welfare standards difficult. The Veterinary Inspectors considered that the system was essentially based on trust.

Regulation in Japan

- 1.28 We draw attention to points made by the British Embassy, Tokyo.³⁷ The system in Japan is one of self-regulation. Animal experiments are regulated by a single clause within the recently amended (1 December 2000) “Law for the Humane Treatment and Management of Animals”. This clause merely places a burden on all those using animals to cause minimal distress and suffering (Q. 247). There is no formal inspection, and no reporting requirement for the numbers of animals used.³⁸

Issues raised

- 1.29 Developing trends in regulation, in animal science, and in the public debate have led us to consider the questions:

- Do human beings have the right to experiment on other animals?
- Do animal experiments work?

We then consider the following key issues:

- The role of the Inspectorate;
- The weighing of harms and benefits (the “cost/benefit analysis”);
- The administration of licences;
- The Animal Procedures Committee;
- The Ethical Review Process;
- The development of the Three Rs;
- Genetically modified animals;
- Public information;
- Openness and Section 24 of the 1986 Act; and
- The Home Office *Statistics*.

³⁷ See transcript of the meeting on 4th July, 2001. We did not visit Japan.

³⁸ No institutions in Japan receive AAALAC accreditation, although one application is in the process of being prepared.

CHAPTER 2: ETHICS

- 2.1 There is no doubt that the issues raised by the remit of the Select Committee, besides being practical, are also moral or ethical. They centre on the question of how human beings should treat other animals. Moral beliefs and sentiment differ about the answer to this question.
- 2.2 There are those who, following a suggestion by Jeremy Bentham in the late 18th century, hold that all creatures capable of suffering are on an equal footing with human beings, regardless of “the number of the legs, the villosity of the skin, or the termination of the *os sacrum*”.³⁹ These people hold that being sentient confers a moral right on animals that they should not be used by human beings for research whose purpose is mainly to benefit humans.⁴⁰ Some activists are prepared to uphold this view by violence.⁴¹
- 2.3 More commonly, there are those who hold that the whole institution of morality, society and law is founded on the belief that human beings are unique amongst animals. Humans are therefore morally entitled to use animals, whether in the laboratory, the farmyard or the house, for their own purposes. And this belief is sometimes combined with a further belief that there is a moral imperative for human beings to develop medical and veterinary science for the relief of suffering, among both humans and other animals. This moral imperative permits the use in research laboratories of animals, whose suffering must be weighed against the ultimate relief of suffering towards which research is directed. This is encapsulated in the weighing of harms and benefits (the “cost/benefit” assessment) in the 1986 Act.
- 2.4 The belief that human beings have the moral right, and in some contexts the moral imperative, to use animals in research, does not entail that animals may be bred and kept for human purposes with total disregard for their suffering. The deliberate or negligent causing of suffering to another, whether human or animal, is a moral vice, cruelty, which is sometimes a crime. Therefore we have a moral duty to avoid or minimise animal suffering wherever possible.
- 2.5 **The unanimous view of the Select Committee is that it is morally acceptable for human beings to use other animals, but that it is morally wrong to cause them unnecessary or avoidable suffering.**

³⁹ *Introduction to the Principles of Morals and Legislation* (1789), chapter 17 “Of the Limits of the Penal Branch of Jurisprudence”, section 1, footnote. The note concludes, “the question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?”.

⁴⁰ This is the view taken by philosophers such as Peter Singer (whom the Committee met during their visit to the United States), and organisations such as the BUAV (Q. 393) and PETA (Q. 1172).

⁴¹ None of those who presented evidence to us said that they endorsed violence, though we did not receive written evidence from some of the more extreme animal rights groups.

CHAPTER 3: THE PURPOSE AND NATURE OF ANIMAL EXPERIMENTS

- 3.1 The reason why animals are used in scientific procedures is to collect data deemed to be valuable. The data are intended to benefit human beings, sometimes through the acquisition of knowledge for its own sake, but more often because the knowledge gained will lead to medical or other benefits. In some cases the data are intended to benefit either the individual animals themselves or, more usually, other animals (veterinary research).
- 3.2 It is true that better quality data on human beings could be obtained were the information gathered by using human subjects. However, animals are used because the majority of people consider that humans are entitled to use animals in ways which would not be acceptable if applied to humans.⁴²
- 3.3 Some people believe, in addition, that animals may be used because they suffer less than humans would, if subject to the same procedures. This belief is partly verifiable. Some animals, certainly mammals and birds, have similar pain receptors and central nervous pathways to humans, and may therefore have much the same capacity to feel physical pain as humans do.⁴³ But the capacity to feel pain is not the same as the capacity to experience suffering or distress, and this is less easy to measure.⁴⁴ It is extremely difficult to conclude with confidence how much suffering or distress is caused by an animal's experience of pain, its memory of or anticipation of pain, or by the fact of its confinement in a laboratory. As Professor Marian Dawkins noted, "recognition of physical health is relatively easy, the recognition of psychological health is more difficult" (Q. 1793). Researchers need to take a balanced view, but ensure that this view is fully informed by ongoing developments in the understanding of animal cognition and suffering.⁴⁵

Types of animal experiments

- 3.4 The Home Office place animal research into seven different categories in their annual *Statistics*, according to the primary purpose of the procedure.⁴⁶ In discussions between the Committee and witnesses, however, there was a general understanding of three types of research, though these categories do not cover all possible aspects of animal research and are not themselves clear cut.⁴⁷
- 3.5 One, research carried out for the sake of extending pure knowledge, or fundamental research, can often be justified under section 5(3) of the Act as "advancement of knowledge in biological or behavioural sciences". Objectors to the use of animals in such research sometimes maintain that it has little or no practical purpose. However, although such research might have no immediate application to medicine, it often yields up considerable, if not wholly foreseen, benefits through the conduct of good science in a particular research field. For example, much of the work conducted in the 1940s by Sir Andrew Huxley and Sir Alan Hodgkin on squid axons eventually proved an essential underpinning for advances in the treatment of patients with neurological disorders. Thus the distinction between pure and applied research is not clear cut.⁴⁸ The Royal Society argued that "virtually all research that is carried out on animals under the Act is directed towards some form of human welfare" (Q. 1010).
- 3.6 Two, applied research — research directed towards specific applications (except assessment of toxicity, discussed below). This includes, but is not limited to, research involving "the prevention...or the diagnosis or treatment of disease, ill-health or abnormality, or their effects, in man, animals or plants".⁴⁹ Applied research also includes the use of animals in the

⁴² See Chapter 2: Ethics.

⁴³ For example, the BUAV (Qs 413 and 416).

⁴⁴ Q. 1830. See also Lord Soulsby of Swaffham Prior and David Morton, eds, *Pain, its nature and management in man and animals*, Royal Society of Medicine, London, 2000.

⁴⁵ See also editorial in *Nature*, 416, 28 March 2002, p. 351.

⁴⁶ Further details on the definition of these categories can be found in the *Statistics*, pp. 5–6.

⁴⁷ For example, the distinction between "fundamental" research and "toxicology" made by Dr Langley (Q. 459), and the difference between "fundamental" research and "applied" research disputed by the Research Defence Society and the Association of Medical Research Charities (Q. 871).

⁴⁸ Systematic surveys conclude that fundamental research does sometimes lead to technological advances, including advances in medicine, but that the extent of this is hard to quantify with any validity (Faulkner, W, 'Conceptualizing Knowledge used in Innovation: a second look at the science-technology distinction and industrial innovation', *Science, Technology and Human Values* 19 (1994), 425–58).

⁴⁹ The 1986 Act, Section 5(3)(a).

- manufacture and testing of vaccines and the “pharming” of animals — animals which might be used to create pharmaceutical products in their milk.
- 3.7 Three, toxicological testing — research used to assess the toxicity of compounds for the protection of man, animals or the environment. This is mostly required by law, both in the UK and in other jurisdictions. This research includes the testing of ingredients and product testing on: pharmaceuticals;⁵⁰ industrial and agricultural chemicals;⁵¹ and a few household products.⁵² The testing of finished-product cosmetics or of ingredients intended primarily for cosmetics is no longer permitted in the UK.⁵³
- 3.8 Other approved uses of animals are for education and training, forensic inquiries, direct diagnosis, and the breeding of animals for experimental or other scientific use.⁵⁴
- 3.9 Around four fifths of animal procedures in the UK are carried out as part of applied research or research for pure knowledge. This research takes place primarily in universities and pharmaceutical companies.
- 3.10 Toxicological testing, which comprises less than a fifth of all animal procedures, involves establishing acceptable levels of safety of new compounds. These compounds include medical drugs, industrial chemicals, fertilisers and a few household products. Such research is usually carried out by contract research organisations on behalf of large chemical and pharmaceutical companies. Much of this research, including the safety testing of new industrial chemicals and new drugs, is required by law.⁵⁵

Non-laboratory animal research

- 3.11 Most animal procedures take place in laboratories. Some experimental procedures also take place on farm animals — horses, donkeys, pigs, goats, sheep, cattle and deer — which are kept in agricultural housing. Approximately 32,000 farm animals were used in the UK in 2000, comprising 1.2% of the total number of animals used. The majority of these were sheep (16,078 animals), pigs (8,326) and cattle (6,801).
- 3.12 During the course of our inquiry, we heard from a number of people involved with research on farm animals.⁵⁶ We also visited the Scottish Agricultural College, the Moredun and Roslin Institutes near Edinburgh, and the Beltsville Agricultural Research Center in the United States.⁵⁷
- 3.13 Dr Judy MacArthur Clark, the Chairwoman of the Farm Animal Welfare Council, said that the Act worked “reasonably well for farm animals” (Q. 1090) but that problems arose from exactly what the Act did and did not cover. This point was also made during our visit to Scotland, when we were told that a given procedure would not fall under the Act if it were considered a part of normal animal husbandry, but that the same procedure would fall under the Act if it were considered experimental. The resulting paperwork acts as a disincentive for veterinarians to engage in nutritional or behavioural research, even though such research could produce welfare benefits and involves virtually no pain or distress. Dr MacArthur Clark agreed that this was an example of bureaucracy working against animal welfare (Qs 1093–94). Experimental animals are also required by the Act to have larger accommodation than animals used in commercial farming. This causes problems for those who wish to carry out research on animals housed under commercial farming conditions (Q. 1109).
- 3.14 We received forthright written and oral evidence from Professor W. R. Allen of the Thoroughbred Breeders’ Association Equine Fertility Unit. Professor Allen said that the Home Office regulations were drawn up with laboratory animals in mind. Under the Act, for example, an animal may not be given more than one general anaesthetic without special permission from the Secretary of State.⁵⁸ Professor Allen said that this provision meant that,

⁵⁰ See *Toxicological research* in Chapter 4.

⁵¹ See in particular our comments on the EU Chemicals White Paper in paras 4.41–4.45.

⁵² Lord Sainsbury (Q. 1687). The Boyd Group is working on a paper on this topic.

⁵³ *Statistics*, p. 19. The European Parliament has recently approved an amendment to the Cosmetics Directive (76/768/EEC), the effect of which will be to ban the testing of cosmetics on animals in Europe by 2004.

⁵⁴ We consider issues raised by the breeding of genetically modified animals in Chapter 8.

⁵⁵ In 2000, there were 455,000 toxicology or safety procedures, 84% of which were required by legislation or other regulations (*Statistics*, p. 19).

⁵⁶ See oral evidence from: Farm Animal Welfare Council and Professor W. Allen, 5th February 2002; Royal College of Veterinary Surgeons, 8th May 2002.

⁵⁷ See Annex 3.

⁵⁸ Section 14(2).

without special permission, the least painful method of embryo transfer in horses — via a ventral midline laparotomy incision performed under general anaesthesia — could be performed only once. However, he was permitted to transfer embryos up to four times a year using a far more painful surgical procedure which required only local anaesthetic.⁵⁹ This was another example where the Act and its implementation actually worked to the detriment of animal welfare.

- 3.15 The Royal Veterinary College expressed concern about regulations governing anaesthesia (Q. 1747), and minor anomalies in accommodation sizes (Q. 1759). Other witnesses said in written evidence that the Act was not always appropriate for experimental farm animals: taking a blood sample is a routine part of farm animal husbandry, but is counted as a procedure under the Act if carried out for experimental purposes.⁶⁰
- 3.16 It is right that the Act should apply to experimental procedures on both farm animals and laboratory animals, but it appears that not enough consideration is given to differences between the two. We are concerned that the Act, which is framed for laboratory animals, may operate to the detriment of animal welfare in experimental farm animals.
- 3.17 **We recommend that the Animal Procedures Committee should invite submissions from the Royal College of Veterinary Surgeons, the Farm Animal Welfare Council and others to establish the appropriate application of the 1986 Act or the modification of its regulations for experimental farm animals.**

Defence research

- 3.18 The MOD has stated that all their animal procedures comply fully with the 1986 Act.⁶¹ They further state that they conduct no research to develop new offensive weapons that involves the use of animals, and that the majority of animals used at Dstl Porton (the Defence Science and Technology Laboratory at Porton Down) are employed in the development of new vaccines, treatments or medical procedures.⁶² Much of this work, including the development of surgical techniques and the creation of new vaccines, has potential benefits for civilians (Q. 1584).
- 3.19 The MOD claim to have made significant progress in the implementation of the Three Rs in defence research. Replacement methods include *in vitro* testing (tests carried out “in glass” rather than in living animals), and physical and computer modelling. Refinement methods include telemetric techniques, which are less intrusive and reduce animal stress.⁶³ From what the MOD has said, it might be that other branches of Government could learn from them in the implementation of the Three Rs.
- 3.20 In addition to full compliance with the Act, there is also an independent committee, the Animal Welfare Advisory Committee (AWAC), which oversees defence research. The 6th Annual Report of the AWAC, which covers the period 31st October to 28th February 2002, is now available on the Ministry of Defence website.⁶⁴ The AWAC also oversees the very few animal experiments which are still carried out at QinetiQ, the recently privatised part of the old Defence Evaluation and Research Agency.
- 3.21 With regard to openness, the Minister estimated that about 90% of the animal research carried out by the MOD is eventually published in the public domain (Q. 1603). We note that the MOD does not have an external lay member on its ERP, although members of the AWAC do have a standing invitation to attend meetings.⁶⁵
- 3.22 It is notable that very few of our witnesses raised defence research as a matter of particular concern, although it has been the subject of a number of Parliamentary Questions in the House of Commons. We did not make a detailed investigation into this subject, but in both written and oral evidence we were told that defence research is subject to the same strict controls as all other animal research. Indeed, the MOD should be commended for being rather more proactive than many research establishments in their search for reductions, refinements and replacements to animal procedures.

⁵⁹ University of Cambridge, Professor Allen (pp. 345–46).

⁶⁰ Horserace Betting Levy Board (Veterinary Advisory Committee) (p. 185); we were also told this during our visit to Scotland (Annex 3).

⁶¹ MOD (p. 124).

⁶² MOD (p. 125).

⁶³ The MOD list ‘alternative’ methodologies in use at Dstl Porton Down (p. 126).

⁶⁴ www.mod.uk

⁶⁵ MOD supplementary memorandum to their oral evidence.

- 3.23 We do, however, have concerns with the training of military surgeons. Currently, UK military surgeons participate in exercises in Denmark to practise battlefield surgical techniques on terminally anaesthetised pigs. The Minister said:
“I think this is of such importance...there is absolutely no doubt that [this training] would save soldiers’ lives.” (Q. 1596)
- The Minister said that a formal application for this training to be carried out in the UK was never made (Q. 1596), but gave the impression that it was easier for the MOD to contract out this training to another country, rather than pursue permission in the UK.
- 3.24 Given the importance of this research to the armed forces, we would hope that were such an application ever made to the Home Office, it would be approved. We are encouraged by the recent memorandum by Lord Sainsbury (June 2002) which indicated that an application might be considered, and policy reviewed, if it had support from the MOD and the Royal Colleges.⁶⁶

Government funded research abroad

- 3.25 The example of the MOD sending surgeons to train in Denmark raises a point of principle. We have no objection *per se* to procedures involving animals being carried out abroad under well-regulated jurisdictions such as Denmark, especially as any collaboration is likely to reduce the overall number of animals used. But we would question why the MOD, or any Government body, would wish to carry out animal procedures abroad if such procedures would not be permitted in the UK.
- 3.26 **We recommend that Government funded research or training using animals abroad should be consistent with the requirements of the 1986 Act.**

⁶⁶ DTI supplementary memorandum to their oral evidence.

CHAPTER 4: THE EFFICACY OF ANIMAL EXPERIMENTS

4.1 We consider the efficacy of animal experiments in two general areas of use, research and toxicology. Within each area we raise the questions:

- Do experiments on animals provide valuable information?
- Are there other practicable means of discovering that information which do not use animals?

Fundamental and applied research

4.2 Scientists who use animals argue that research involving animals has been vital to the understanding of disease and in the development of possible cures. Research scientists do not solely work on animals, but use animal research as one method among many. Scientists say that they prefer not to use animals, both because of the potential suffering caused to the animals, and also because of the high costs involved in both time and money. Animal use, they argue, continues only where it is absolutely necessary.

4.3 Other witnesses to the Committee argue that animal experimentation as a method for protecting human health is at best flawed, at worst pointless. They consider that, for this purpose, it is inaccurate and often misleading, as results in animals cannot be “read across” to humans. They also claim that non-animal methods have not been as well-funded as animal research, so the relative efficacy of the two approaches has not been fairly tested. They argue that animal research continues only because it has always been done, and scientists have had to conform to this expectation or risk being isolated.

4.4 The main criticisms levelled against the use of animals in research are:

- research on animals is unethical. Harm should not be caused to any animal unless it is for the ultimate benefit of that particular animal;
- research on animals is ineffective. Diseases manifest themselves in different ways in animals than in humans. New compounds (for example, new pharmaceutical products) may be beneficial to certain animals, but have no effect on humans. Similarly, compounds which might have been beneficial to humans have in the past been ruled out because they have produced negative results in animals;⁶⁷
- animal research is harmful to human health, because it diverts money away from non-animal research, and some drugs have serious side-effects which are not discovered until the drug is administered to patients. A number of witnesses argued that animal research provides misleading information, and is responsible for the growing trend in drug-related doctor-induced illness (“iatrogenesis”);⁶⁸
- there is a record of failure in modelling disease. Induced conditions, such as artificially induced Parkinson’s Disease caused by chemical or physical lesions in the brains of mice, are not good models of naturally occurring conditions.⁶⁹ Equally, drugs which have been effective in combating stroke in animals have been ineffective in humans;⁷⁰
- some animal research is trivial;⁷¹ some is used to develop products which duplicate existing ones;⁷² and some is of little relevance —retrospective analyses show that some animal research is never cited in the literature;⁷³
- animal use continues largely through habit, scientific inertia, and the availability of funding from pharmaceutical companies and research councils. If the same amount of

⁶⁷ The point that animals are different from humans and that the results of the research on animals are therefore not applicable to humans is made by almost every opponent of vivisection, including the BUAV, the NAVS, PETA, Professor Vernon Coleman, Doctors and Lawyers for Responsible Medicine and many members of the public who submitted written evidence.

⁶⁸ Professor Vernon Coleman (Q. 1276) and Doctors and Lawyers for Responsible Medicine (Qs 1721–24). See also paragraph 4.17.

⁶⁹ BUAV (p. 89). The MRC disagree (p. 221), as do the Parkinson’s Disease Society of the UK (p. 251).

⁷⁰ FRAME and Dr Hadwen Trust (Q. 462). Professor Rothwell said that a treatment for stroke had been developed (Q. 651), but this statement was criticised by Dr Pandora Pound (p. 317).

⁷¹ The BUAV cite the development of sucralose (p. 98).

⁷² BUAV (p. 81).

⁷³ PETA (p. 255).

money and intellectual effort had been invested in non-animal methods over the years, scientists would have discovered similarly effective drugs.

4.5 Scientists and industry have countered that animal research is effective. The Department of Health, which spends approximately £6 billion each year on pharmaceuticals, asserts unequivocally that:

“Properly regulated animal research is absolutely essential to the discovery of new treatments as well as to the assessment of safety and efficacy of medicines”.⁷⁴

4.6 In particular those in favour of animal research argue that:

- animals are used to develop an understanding of normal, healthy biological systems;
- animals are used as models for humans.⁷⁵ Animal research helps scientists to understand the mechanisms of diseases and compounds, as well as their specific effects. Humans would of course be better models and human volunteers are always used in later stages during clinical trials. Experimenting on humans at the early stages of drug development is unacceptable, so the best available models — animals — should be used instead;
- many mammals are physiologically very similar to humans: they have similar vital organs — brain, heart, lungs, liver, kidneys — and process toxins in the liver in similar, though not identical, ways. General scientific opinion argues that “similarities in mammalian physiology are such as to justify limited extrapolation across species.”⁷⁶ For example, work on new forms of oral contraceptives can be undertaken on rodents or sheep, as the pituitary gland, which is responsible for the release of reproductive hormones, is similar in all mammals including humans;⁷⁷
- the usefulness of animal models is illustrated by the similarity of the veterinary and human pharmacopoeias, and the same drugs are often used to treat the same diseases;⁷⁸
- research on animals is often carried out for the overall benefit of other animals;
- animals are required for the manufacture of each batch of certain medical preparations. It is not simply a question of using animals for the initial research phase. In particular, there are a number of vaccines, including the polio vaccine, where each new batch needs to be tested on animals to ensure efficacy and safety;⁷⁹
- the unpredictable nature of discovery reinforces the need for fundamental research, as well as applied research closely targeted to specific diseases: new discoveries, though sometimes unforeseen, are the result of carrying out “good science” in a particular research field;⁸⁰
- animal research is needed because systemic effects can be investigated only in whole body systems. Scientists agree that research *in vitro* is, where possible, preferable, as experimental conditions can be more easily controlled, and the results are more repeatable and reliable. But such research can only examine certain effects of a drug on a particular type of cell. To understand how different organs in the body interact under the effects of a drug, a whole organism — an animal — is needed; and
- animal experiments continue to be used because they have produced, and continue to produce, extensive and beneficial advances in science: “Virtually every medical achievement of the last century has depended directly or indirectly on research in animals”.⁸¹

⁷⁴ DoH (p. 163).

⁷⁵ See in particular Dr Michael Festing, ‘The Use of Animals as Models of Humans in Biomedical Research’, (p. 140).

⁷⁶ Mr Smith, Royal Veterinary College (Q. 1752).

⁷⁷ Goodman, S. & Check, E. ‘The great primate debate’, *Nature*, vol. 417 (2002), 684-87; see also the Society for the Study of Fertility (p. 321).

⁷⁸ *New Scientist*, 8th June 2002, p. 53.

⁷⁹ Dr Langley from the Dr Hadwen Trust acknowledged that this is a “problem area”, but pointed out that the rabies vaccine, for example, became purer and safer once it was tested *in vitro* (Q. 418).

⁸⁰ See *Types of animal experiments* in Chapter 3.

⁸¹ United States Public Health Service, quoted by the Royal Society (p. 286). The Royal Society also gives specific examples of the “Contribution of Animal Research to Medical Advances” (pp. 286–93). This paper was also submitted by Professor Colin Blakemore.

- 4.7 Research scientists argue that there are already strong incentives to use non-animal methods. They are sensitive about subjecting animals to scientific procedures. Animal experiments are expensive compared to *in vitro* alternatives, while using non-animal methods involves less bureaucracy and avoids the delays associated with the current licensing system. Scientists recognise that animal models are more variable than *in vitro* models. Scientists therefore say that they have every incentive not to use animals where possible.
- 4.8 On balance, we are convinced that experiments on animals have contributed greatly to scientific advances, both for human medicine and for animal health. Animal experimentation is a valuable research method which has proved itself over time.
- 4.9 What cannot be ascertained, however, is whether many of these advances could have been made by other methods. We have been told that certain procedures and approaches which use animals, and which can subject them to considerable suffering, have been pursued over long periods of time with apparently limited success.⁸² It seems to us that non-animal methods have not always been given sufficient consideration.
- 4.10 There is no doubt that considerable reduction in the use of animals has taken place. Nearly a million fewer animals were used in scientific procedures in 2000 than were used in 1987, just after the 1986 Act was introduced.⁸³ Since the introduction of the Act a “culture of care” has been established.⁸⁴ In the last 15 years great progress has been made in the introduction of non-animal methods. Since 1995, procedures for toxicological testing have fallen by nearly one third.⁸⁵ The internet has made the retrieval of relevant data far easier. Replacement methods have been developed in fields such as computer modelling (*in silico* methods) and *in vitro* assessment, while refinements have been developed in areas such as the establishment of humane endpoints and telemetrics.⁸⁶ Reduction in the number of animals used has been achieved through better statistical training and better experimental design. The acute oral LD50 test has been largely replaced by the Fixed Dose Procedure, leading to a reduction in animal use.⁸⁷ Refinement methods, including the better understanding and application of humane endpoints, are now routinely used. Scientists have led this great improvement in animal welfare, but new methods rapidly become the standard methods, such that it is soon forgotten that any improvement has taken place.⁸⁸
- 4.11 Like members of any profession, scientists become accustomed to particular methods of working. Animal experimentation is such a standard part of fundamental biological research that it might be hard for an individual to gain recognition and funding if he or she persisted in using only non-animal methods.
- 4.12 Scientific status also derives from discovering the new. Lord Sainsbury, the DTI Minister, said that scientists were motivated primarily by discovery (Q. 1699). Replacements, refinements and reductions are not discoveries of the kind for which scientists generally strive. The status of those who work to develop replacements or refinements to animal experiments is questionable.⁸⁹ There are, for example, no specific university posts in the Three Rs. The Home Office Minister, Angela Eagle, speaking of the development of reductions, refinements and replacements, said, “I do not get the impression...that it is one of the most exciting and sought after areas of scientific endeavour” (Q. 538). The development and use of non-animal methods has always taken place, but it has had a low profile. We consider that there is merit in providing additional impetus for the development and use of the Three Rs.
- 4.13 In considering the use of animals in fundamental research, we have therefore reached two basic conclusions.
- 4.14 **There is at present a continued need for animal experiments both in applied research, and in research aimed purely at extending knowledge.**

⁸² For example, the use of animal models for stroke and the use of genetically modified mice as models for cystic fibrosis (see Qs 462 and 463); and research into xenotransplantation, BUAV (p. 64).

⁸³ The figures are — 1987: 3,631,400 procedures; 2000: 2,714,700 (*Statistics*, table 20).

⁸⁴ Dr James Anderson, introductory session, House of Lords conference (Appendix 4).

⁸⁵ *Statistics*, p. 19.

⁸⁶ MOD (p. 126).

⁸⁷ See footnote 19.

⁸⁸ Dr Michael Festing, giving evidence with the Royal Society (Q. 1057).

⁸⁹ This point was made to us by Dr Langley from the Dr Hadwen Trust (Q. 477) and Professor Balls from ECVAM (Q. 1466), although other witnesses, such as Professor Goldberg from Johns Hopkins University (Q. 1518) and the Royal Society (Q. 1051), disagreed with this view.

4.15 **There is scope for the scientific community to give a greater priority to the development of non-animal methods, and more consideration could be given to the pursuit of the Three Rs.**

*Toxicological research*⁹⁰

- 4.16 In toxicology, *in vivo* tests (tests carried out in live animals) form only part of a complex process of risk assessment that takes account of other sources of information, including analysis of chemical structure and *in vitro* tests. The purpose of toxicological risk assessment is to evaluate the likelihood of harmful effects resulting from exposure to specific doses or concentrations of particular chemicals, and thus to inform the risk management process (actions such as prohibition of the use of a chemical, the specification of maximum recommended doses, or the provision of advice on safety precautions).
- 4.17 In the development of new pharmaceutical compounds, testing in animals is similarly only one stage of a much larger process. Pharmaceutical companies have told us that, of half a million compounds initially considered, preclinical lead optimisation screening (selecting the most likely candidate compounds using *in vitro* and *in silico* methods) reduced the number tested in animals to ten.⁹¹ Of this ten, seven were rejected, three went on to clinical trials in humans, and just one would eventually be released onto the market.
- 4.18 Many of those opposed to the use of animal experiments were particularly critical of *in vivo* toxicological tests. Their principal arguments were:
- species differences mean that tests in animals are inapplicable to humans. Aspirin, for example, is a teratogen⁹² in many animals, but not in humans.⁹³ Aspirin also has beneficial effects in humans (for example, in helping to prevent strokes) which are not reproduced in animals.;
 - animal-based toxicology has failed to protect human health. Adverse drug reactions have risen 10-fold between 1990 and 2000.⁹⁴ Some witnesses cited the thalidomide tragedy as an example of the failure of *in vivo* toxicity testing;
 - tests on new drugs which are shown to be toxic in animals are sometimes later or concurrently carried out in humans anyway, so why are the tests done in animals in the first instance?⁹⁵ Animal tests are done in order to give legal protection to pharmaceutical companies if their products are later found to be toxic;
 - many new drugs are “me too” drugs — versions of drugs which are already on the market. Animals should not be used to test drugs which are not medically necessary, but simply aim to provide profits for pharmaceutical companies;
 - regulators are too inflexible — toxicity assessments should not be carried out on a “tick the box” approach. Not enough use is made of existing data from humans and animals, and many substances have an extensive history of use which should be taken into account when assessing toxicity. The EU Chemicals White Paper, which proposes to back-test many thousands of chemicals, would require millions of unnecessary animal deaths in order to satisfy regulators, rather than to improve safety standards;
 - the validation requirements for non-animal tests are in marked contrast to the almost total lack of formal validation of animal test methods.⁹⁶ Standards of validation required by regulatory bodies for new non-animal tests are more stringent than the standards of validation required for animal tests. Results from animal methods are still held to trump results from other methods.

⁹⁰ See the report of the Working Group on Toxicology (House of Lords conference, 21st May 2002), printed as part of Annex 4 to this Report.

⁹¹ For a discussion of this process, see Christopher Atterwill and Mark Wing, ‘*In Vitro* Preclinical Lead Optimisation Technologies (PLOTs) in Pharmaceutical Development’, *Alternatives to Laboratory Animals*, 28 (2000), 857–67.

⁹² A teratogen is any substance or factor which can cause malformation of the embryo or foetus.

⁹³ BUAV (p. 104).

⁹⁴ Report by the Audit Commission, *A spoonful of sugar: medicines management in NHS hospitals* (2001), cited by the BUAV (p. 104). See also paragraph 4.4.

⁹⁵ Professor Vernon Coleman (Q. 1235). This question is answered, at least in part, in the memorandum by the Parliamentary Under-Secretary of State, Lord Hunt of Kings Heath, printed with his oral evidence.

⁹⁶ Dr Gill Langley, “Animal and non-animal tests—an uneven playing field for validation”, BUAV (p. 100).

- 4.19 Scientists argue that the use of two species and the existence of historical data enable toxicologists to use animal tests to contribute to the overall assessment of hazard. All our witnesses agreed that *in vivo* toxicological tests were imperfect; scientists argued that despite their imperfections, animal tests are often still the best available. In particular, scientists argued that:
- the whole toxicological process, taking into account known species differences, and allowing for variation within species, can provide an acceptably accurate assessment of what level of dose of a given compound is likely to be safe;
 - *in vivo* toxicology is necessary to obtain whole organism toxicity responses, rather than the responses of individual cell-types which can be assessed *in vitro*;⁹⁷
 - poisons in humans are processed by the liver, and the liver is where most adverse effects are found. Scientists, however, cannot yet artificially replicate the functions of the liver, and are currently left with no choice but to continue to use animals in toxicological testing where liver function is important.⁹⁸
 - the use of two species in a toxicological assessment is a compromise which provides some reassurance that important toxic effects have not been missed. The two most commonly used species, the rat and the beagle, are well calibrated models — so much research has been carried out in the past that similarities and differences between them and humans can be assessed with a reasonable degree of confidence;
 - doses given to test animals are at a much higher level than those given to human patients, in order to allow for both inter-species and intra-species variation;
 - the thalidomide tragedy in the UK occurred because the animal testing was incomplete. More extensive testing on pregnant rabbits, as was done in the US where the drug was not licensed, revealed the devastating side effects;⁹⁹
 - improvements in toxicology are taking place all the time. Increased use is made of: *in vitro* methods,¹⁰⁰ computer modelling;¹⁰¹ and data extracted from human and animal patients.¹⁰² All these non-animal methods are used wherever possible, especially for the preliminary screening of drugs. In many cases, though not all, animal toxicity tests “provide valuable information, not available from any other source, for assessing human health effects”;¹⁰³
 - adverse drug reactions are usually the result of poor prescribing practice and over-dosing. Rare effects, in a small sub-group of the human population, are very difficult to predict using laboratory tests, or even using clinical trials in humans.
- 4.20 The scientific position was summarised by Dr Robert Coleman:
- “we have a moral and a legal obligation with new compounds to do our very best to ensure that anybody who takes them is not going to come to harm. Part of that process is testing in animals and if we get it wrong, we get it wrong, but more often than not we will get some information that will be valuable to us. Some compounds slip through the net. I do not really see how we can overcome it. It does not mean to say that [animal testing] does not have a value.” (Q. 1574)
- 4.21 The effectiveness of *in vivo* toxicity tests is difficult to assess, due to the ethical constraints on testing chemicals in human subjects which have shown adverse findings in animals. Only in the case of pharmaceutical substances, administered in doses judged to be safe, or after accidental exposure to chemicals, can the results of animal tests be checked against actual human experience.

⁹⁷ Dr Smith (Q. 1003).

⁹⁸ At present, once they are removed from the body, liver cells last for no more than a few hours, which limits their usefulness for *in vitro* studies.

⁹⁹ Department of Health, “Assessment of Reproductive Toxicity” (p. 173).

¹⁰⁰ See Professor Iain Purchase, “Prospects for Reduction and Replacement Alternatives in Regulatory Toxicology”, *Toxicology in Vitro*, 11 (1997), 313-19; for developments in *in vitro* tissue culture methodology see FRAME (p. 149).

¹⁰¹ See memorandum by Professor Denis Noble (p. 250).

¹⁰² Professor Balls (Q. 1465).

¹⁰³ Paragraph 9 of “The value of animal toxicity results for predicting human health effects”, Professor Iain Purchase (printed with his oral evidence).

- 4.22 The scientifically most valid method for assessing toxicology, as all our witnesses agreed, would be to test directly in humans — but this could involve an unacceptable risk to those involved, and it is said that insufficient volunteers would be forthcoming.¹⁰⁴
- 4.23 Recently, the International Life Sciences Institute (ILSI) undertook a study of a series of pharmaceutical compounds that had shown toxicity in human clinical trials.¹⁰⁵ This study found that in 71% of cases, the effects seen in people were foreshadowed in the animal tests carried out prior to the clinical trials. Moreover the efficacy of the animal tests for the direct purposes for which they were intended was still higher. Of the 29% of effects not detected in animal tests, the majority were of a type that the animal tests were not designed to detect, or were intrinsically undetectable in this type of test, for example, headache, dizziness, and certain skin reactions.
- 4.24 The Department of Health argue that the current system has proved itself through use: “the current test battery, based on a mixture of *in vitro* and *in vivo* tests, has been shown to be extremely effective in terms of predicting human toxic responses”.¹⁰⁶
- 4.25 **We consider that toxicological testing in animals is at present essential for medical practice and the protection of consumers and the environment, as it often provides information that is not currently available from any other source.**

The development of non-animal toxicological tests

- 4.26 The current system of toxicological testing may be effective in most instances, but there is little doubt that it could be improved. About two thirds of the compounds which are approved for clinical trials in humans are not subsequently licensed for general use. Of those drugs which do make it to market, some are subsequently withdrawn when previously undiscovered toxic effects come to light. It has been argued that the toxicity of at least some of these compounds could have been determined by better use of *in vitro* methods (Q. 1568).
- 4.27 The science underpinning the current system is also unsophisticated. The dose shown to be safe in animals, the “No Adverse Effect Level”, is typically divided by 10 to take account of differences between animals and humans, and by 10 again to take account of differences in individual susceptibility.¹⁰⁷ These factors are highly approximate, and Professor Purchase observes that “the current default value for one component of the ‘interspecies’ factor may be too small”.¹⁰⁸
- 4.28 Dr Gill Langley, of the Dr Hadwen Trust, argued that many of the standard toxicological animal tests have never undergone formal validation, or have failed retrospective validation.¹⁰⁹ Professor Combes, from FRAME (Fund for the Replacement of Animals in Medical Experiments) was particularly critical of the carcinogenicity bioassay (Q. 458). In giving oral evidence with the Department of Health, Sir John Pattison acknowledged that “There is a dearth of research in this area” (Q. 1485). All sides of the debate on the use of animals acknowledge that there are problems with animal toxicity testing.
- 4.29 Partly for this reason, and partly because toxicology assesses clearly defined end-points, greater progress has been made in finding non-animal methods in toxicity than in pure or applied research (Q. 459). The European Centre for the Validation of Alternative Methods (ECVAM), is shortly to publish a report on “Alternative (non-animal) methods for chemicals testing: current status and future prospects”.¹¹⁰ While progress has been made, the Minister, Angela Eagle MP, warned that “the easy ways of replacing animal use have been attained already” (Q. 540).¹¹¹
- 4.30 The development of replacement tests for existing animal tests is difficult. The problem was explained by Herman Koeter of the OECD.¹¹² He said that toxicological assessment was like

¹⁰⁴ Dr Robert Coleman (Q. 1574).

¹⁰⁵ Olson, H. et al., ‘Concordance of the Toxicity of Pharmaceuticals in Humans and Animals’, *Regulatory Toxicology and Pharmacology* 32 (2000), 56–67. This paper is mentioned by the Department of Health (p. 174). The DoH also submitted this paper, and nearly 50 other scientific papers, in support of their written evidence.

¹⁰⁶ DoH (p. 171).

¹⁰⁷ Paragraph 11 of “The value of animal toxicity results for predicting human health effects”, Professor Iain Purchase.

¹⁰⁸ *Ibid.*

¹⁰⁹ Dr Gill Langley, “The efficacy of animal tests in toxicology”, BUAV (p. 99).

¹¹⁰ Worth, A. P. & Balls, M., eds. (2002). *Alternative (non-animal) methods for chemicals testing: current status and future prospects*. A report prepared by ECVAM and the ECVAM Working Group on Chemicals. ATLA 30, Supplement 1, 1-125.

¹¹¹ This point was also made by Professor Purchase (Q. 646).

¹¹² This meeting took place during our visit to Paris (see Appendix 3).

a jigsaw puzzle, with many different tests all interlocking. Replacing individual tests was difficult, and unlikely to result in the saving of many animal lives. What was needed was not the gradual replacement of individual pieces of the jigsaw, but a whole new system of toxicology — a paradigm shift of significant magnitude.

- 4.31 We recognise that this is a difficult process. Angela Eagle said that “We are at the stage where it is much harder to see how some of the experiments currently being done could be replaced but that does not mean that some of our most creative, finest scientific brains out there ought not to turn their minds to it” (Q. 540). We agree.
- 4.32 During the conference we held in the House of Lords on 21st May 2002, delegates considered that the replacement of 90% of animal experiments in toxicology would take at least 20 years.¹¹³ The development of non-animal toxicological methods therefore needs sustained investment and research over a period of time. Any serious undertaking to develop non-animal tests needs substantial Government backing, and a sustained and co-ordinated, international effort.
- 4.33 **We consider that the development of scientifically valid non-animal systems of research and testing is important, not just to improve animal welfare, but to provide substantial benefits for human health.**

Toxicology and the law

- 4.34 Many toxicological tests are required by law.¹¹⁴ In the UK, the Medicines Control Agency demands proof of safety before it will license a new drug. Similarly, the Health and Safety Executive demands the toxicological assessment of industrial chemicals and various other products, which requires information “some of which can only be obtained from animal testing”.¹¹⁵
- 4.35 Regulations on toxicity testing for new compounds have now largely been harmonised internationally. This is clearly beneficial in terms of animal use. For example, instead of three very similar sets of tests being carried out for a new drug to be licensed in the European Union, the United States and Japan, only one set of tests needs to be carried out which is accepted by the regulatory authorities in all three jurisdictions.
- 4.36 For new drugs and medicines, the harmonisation body is the ICH — the International Conference on Harmonisation. There are four members — regulators from the US, from Japan, and from the European Union, and representatives from the global pharmaceutical industry. Better harmonisation has already led to a reduction in animal use (Q. 892), and the ICH plays “an important quasi-legal role in drug development”.¹¹⁶
- 4.37 For new chemical compounds, the harmonisation body is the OECD — the Organisation for Economic Co-operation and Development. There are 39 member states. Adoption of non-animal toxicological tests is slow, as the OECD requires consensus from all member states before new test guidelines are adopted.¹¹⁷
- 4.38 It is important for regulatory authorities to keep abreast of technological developments, and to be aware of new non-animal testing methods which these may allow. We recognise that decisions on whether individual animal tests can be replaced or refined cannot be taken unilaterally by the UK Government, but there appears to be no reason why the UK Government should not take the initiative for moving the agenda forward.
- 4.39 One area where the Government could take the initiative is in welfare standards in toxicological testing. Currently, rats involved in many toxicological experiments are kept in wire-bottomed cages. These are easier to clean than solid-bottomed cages, and the lack of nesting material means that no extraneous substances can interfere with the test. Such cages potentially have a welfare cost, as rats not only have no nesting material, but the wire floor can cause prolonged physical discomfort. It is possible that these wire-bottomed cages seriously compromise the welfare of hundreds of thousands of animals each year. We learnt from the Organisation for Economic Co-operation and Development that no government had yet even asked the OECD to consider including in OECD Test Guidelines the

¹¹³ See Report of the conference of 21st May, 2002 (Appendix 4), and Professor Balls (Q. 1457).

¹¹⁴ 84% of UK toxicological tests were required by law or regulation in 2000 (*Statistics*, p. 19).

¹¹⁵ Health & Safety Executive (p. 162).

¹¹⁶ DoH (p. 164).

¹¹⁷ See note of the meeting with Herman Koeter from the OECD in Appendix 3, and also Lord Sainsbury (Q. 1696).

recommendation to use solid-bottomed cages, nesting materials, and other relatively uncontroversial environmental enrichments.

- 4.40 **We recommend that the Government should take greater steps to promote the adoption of replacements and the incorporation of refinements into animal test guidelines issued by the International Conference on Harmonisation and the Organisation for Economic Co-operation and Development.**
- 4.41 A number of witnesses have highlighted the importance of the need for co-ordinated international action has been highlighted by the recent European Commission White Paper, *Strategy for a future Chemicals Policy*.¹¹⁸ This proposes carrying out toxicity tests on thousands of chemicals which have been in use for some time. The Institute for Environment and Health, in a report prepared for the DTI in April 2001, estimated that at least 12 million vertebrates would be required for the testing proposed.¹¹⁹
- 4.42 The White Paper on Chemicals has already been the subject of an Inquiry by the House of Lords European Union Select Committee.¹²⁰ We note and endorse their conclusion relating to animal testing that “the very success of any chemicals strategy depends on the public being reassured that a serious effort is being made to develop alternatives to animal testing” (para. 191).
- 4.43 We also consider that there is very little political will to reduce the need for animals in toxicology. At the European level, the funding for ECVAM is under constant pressure.¹²¹ In the United Kingdom, our questioning of different Government departments has revealed that no department is prepared to take responsibility for the issue of animals in science in general, and for the need for animals in toxicology in particular. We therefore note and endorse the further observation of the House of Lords European Union Select Committee that “there is a lack of resources and of political will in the EU to bring non-animal tests into use” (para. 197).
- 4.44 **The Government and the scientific community should engage in a systematic and visible search for methods involving the Three Rs in toxicology. The Government should nominate one department to take the lead on this.**
- 4.45 **The UK Government should use their influence to urge the EU to make the development and validation of replacements for animal experiments a priority, particularly in toxicology.**

Potential of developing technologies

- 4.46 There is considerable potential for companies specialising in the Three Rs. We have taken evidence from Dr Robert Coleman, the Director of Pharmagene in the UK, and have met Dr Paul Silber, the Director of In Vitro Technologies in the US. Both companies illustrate the commercial potential for non-animal technologies, particularly in screening compounds in the relatively early stages of drug development.
- 4.47 Dr Coleman said that there were problems with the availability of human tissue for use in *in vitro* studies.¹²² It is important that the events at Bristol Royal Infirmary and Alder Hey do not provoke a reaction which prevents the provision of human tissues to appropriate companies.
- 4.48 We also note that recent developments in computer modelling in the UK have potential for use in toxicology. The Food and Drug Administration in the United States is in discussions about how a particular computer model can be incorporated into current regulation.¹²³ Such replacement technologies are likely to be increasingly important in the future. In parts of Europe, there is a move away from animal-based research, particularly in toxicology. The UK should act now to be in the forefront of new developments.
- 4.49 **The promotion of the commercial advantages of the Three Rs needs a clear lead from a nominated department within Government.**

¹¹⁸ Presented by the Commission in February 2001 (COM(2001)88 final). See also para. 4.18.

¹¹⁹ *Testing Requirements for Proposals under the EC White Paper, “Strategy for a future Chemicals Policy”*, MRC Institute for Environment and Health, University of Leicester, 2001.

¹²⁰ 13th Report, Session 2001–02, “Reducing the Risk: Regulating Industrial Chemicals” (HL Paper 81).

¹²¹ Professor Balls (Q. 1442).

¹²² See memorandum by Dr Robert Coleman (printed with his oral evidence).

¹²³ Professor Denis Noble (p. 250).

CHAPTER 5: REGULATION AND THE ANIMALS (SCIENTIFIC PROCEDURES) ACT 1986

- 5.1 Among those who work under the Act, there is a general acceptance that the basic legislation works well. Disagreement with the operation of the Act is focused on practical matters arising out of the Act, rather than with the Act itself.
- 5.2 Witnesses who are opposed to vivisection clearly object to the premises of the Act. Section 24 — the statutory bar on the disclosure of information by the Home Office — was frequently criticised by both animal rights and animal welfare groups, who argue that informed debate without the disclosure of appropriate information is impossible.
- 5.3 Many witnesses who were concerned with animal welfare rather than with animal rights were perhaps surprisingly uncritical of the Act. With the exception of Section 24, their complaints were that many aspects of the Act were not being adequately enforced. Many were particularly critical of the lack of adequate inspection, and by what they considered was the less than rigorous enforcement of the requirement that no animal procedure should be performed where there is a non-animal replacement, and that refinements and reductions should be incorporated wherever possible.
- 5.4 What follows is a consideration of some of the detailed aspects of the operation of the 1986 Act, and how we consider beneficial changes could be made.

The Inspectorate

- 5.5 The Inspectorate is composed of registered medical and veterinary practitioners, who usually have experience of biomedical research and possess appropriate postgraduate qualifications.¹²⁴ Inspectors are both highly skilled and specifically trained in laboratory animal science. Although scientists often complain about the licensing system, many are highly complimentary about the Inspectors themselves. Currently there are 25 Inspectors. The Home Office hopes to increase the number of Inspectors to 33 by the beginning of 2004, but we note that recruitment has been particularly slow in the past year, and even this timetable seems optimistic.¹²⁵
- 5.6 Some have argued that as Inspectors have all been involved in animal experimentation at some point, they cannot be trusted to operate the Act impartially.¹²⁶ Inspectors have also been accused by some animal welfare groups of becoming too closely involved with licence holders, so that they do not inspect premises sufficiently rigorously. Others reply that the Named Veterinary Surgeon (NVS) and Named Animal Care and Welfare Officer (NACWO) ensure that the animals' interests are represented, and that the Inspectors are extremely rigorous in their inspections.
- 5.7 Belief in the impartiality of the Inspectorate has been undermined by allegations such as those made by Uncaged Campaigns concerning Imutran, a company which undertook research into xenotransplantation.¹²⁷ The Home Office, despite promising in November 2000 that members of the APC would participate in any investigations into allegations of malpractice, did not invite the APC to participate in the investigation into Imutran. Indeed, no formal investigation took place, only a routine review of compliance issues by the Inspectorate.¹²⁸ The actions of the Inspectorate, which were criticised by Uncaged, were also not subject to scrutiny by an external body.
- 5.8 The name "Inspectorate" suggests to the general public that inspection of animals is a large part of its role, and the Inspectorate do indeed carry out around 2,100 visits to licensed, designated establishments each year. Some witnesses have argued that the Inspectorate should spend even more time in its role as the "police force" of the 1986 Act.¹²⁹ The Chief Inspector, however, disagreed:
- "the greatest contribution the Inspectorate makes to laboratory animal welfare is at the design and planning stage. I hesitate to say that we should be taking resources away from that at present to put back into inspection" (Q. 129).

¹²⁴ See the memorandum by the Home Office (printed with the oral evidence of 3 July 2001).

¹²⁵ Qs 1871–74.

¹²⁶ BUAV (Q. 445).

¹²⁷ For further details, see the report by the RSPCA, "Non-Human Primates in Xenotransplantation Research in the UK" (June 2002).

¹²⁸ Robert McCracken, a member of the APC, was unhappy with this review: "the concerns raised ... were not allayed by the brief, routine report by the Inspectorate" (Q. 804).

¹²⁹ NAVS (Q. 1323).

- 5.9 We agree that good advice on project design and the incorporation of the Three Rs has a far more beneficial effect on animal welfare than the maintenance of minimum standards through increased inspection. In their dual role of advisor and inspector, the Inspectorate have created a culture of care which is far more effective than the threat of a few more unannounced visits.¹³⁰
- 5.10 We have therefore considered, but rejected, the proposal that the Inspectorate should be divided into those who advise on the Project Licences and those who actually inspect the premises. The detailed knowledge of the projects in progress enables the Inspectorate to continue to advise on procedures to the benefit of both science and animal welfare. We therefore agree with the assessment of the Home Office Minister, Angela Eagle MP, that “there is a synergy between the licensing process and the inspection process” (Q. 519).
- 5.11 We conclude, however, that the Inspectorate are an inappropriate body to monitor the effectiveness of new Home Office regulations. This was demonstrated by the review by the Inspectorate of the implementation of the Ethical Review Process (ERP).¹³¹ We consider this review to be flawed on many counts: the Inspectorate paid only cursory attention to the resource implications of implementing the ERP; shortcomings are blamed on local implementation while the Home Office and Inspectorate exonerate themselves entirely; and interviews were conducted by Inspectors, thus discouraging licence holders from voicing any criticisms of the implementation of the process by the Inspectorate. Any such future reviews of the effects of changes in policy should be conducted by a more independent group such as the Animal Procedures Committee.
- 5.12 Both these matters, the independence of the inspection process and the independence of policy review, centre on the monitoring of the Inspectorate — *Sed quis custodiet ipsos custodes?*¹³² The independence of the Inspectorate is important if the public is to have confidence in the regulatory system; it is also important that researchers consider that they receive consistent, impartial advice.
- 5.13 **We recommend that the Inspectorate should be subject to periodic review, by a body other than the Inspectorate itself.**
- 5.14 We wish to avoid being over-prescriptive on how such a review might be carried out. We suggest that such a review might be instigated by the APC. We note also that the reviewing body would need to have access to all the Inspectorate’s records, including notes of what was seen and done during inspections of designated establishments.¹³³ We consider that this level of information should be made available to ensure that the Inspectorate is sufficiently accountable.
- 5.15 We consider that the Inspectorate is a trustworthy, professional body. They certainly had the confidence of the Minister, Angela Eagle MP, who considered that “the Inspectorate do a very, very good job to a high degree of integrity. They do not let the friendly relationships they may have with individuals that work in labs have an effect on the work they are producing” (Q. 538). However, we also recognise that it is important to remove any suggestion of complicity between the local Inspector and the Licence holders.
- 5.16 Furthermore, the practice whereby one Inspector does the bulk of the advice and inspection in one establishment has led to examples of inconsistency. Lord Winston said, “We have had licences turned down by one Inspector in the United Kingdom where elsewhere the same licence has been given in the north of England” (Q. 1842). Inspections already occasionally involve Inspectors with particular expertise from other areas (Qs 1928–30). We consider that this good practice should be extended and formally instituted.
- 5.17 **We recommend that designated establishments should be inspected once a year by an Inspector from another area.**
- 5.18 We are also interested in the idea put forward by Professor Page, that “lay visitors” should accompany inspectors on their visits (Q. 946).¹³⁴ We invite the Home Office to consider how “lay visitors”, possibly NACWOs or lay members from ERPs, might be encouraged and

¹³⁰ As Les Ward, Director of Advocates for Animals commented, the “law is based on trust. It does not matter how many inspectors you have.” (Q. 1368)

¹³¹ Published in November 2001.

¹³² Juvenal, Satires VI, l. 347. In this context translated as, “But who will inspect the inspectors themselves?”.

¹³³ Robert McCracken said that much of this information was currently unavailable even to the APC (Q. 849).

¹³⁴ Robert McCracken put forward a similar idea for “Boards of Visitors”, similar to those for prisons, in paragraph 9 of his memorandum (printed with his oral evidence).

enabled to obtain access to other research establishments, to ensure consistency of inspection and to spread best practice in animal care.

Weighing of harms and benefits

- 5.19 The weighing of harms and benefits, often called the “cost/benefit analysis”, lies at the heart of the 1986 Act. Before licensing any procedure, the Act requires the Secretary of State to take account of “the likely adverse effects on the animals concerned against the benefit likely to accrue”.¹³⁵ A note on the “cost/benefit” assessment by the Chief Inspector in 1993 states that “almost none of the elements in the cost/benefit analysis lend themselves to strict quantification. What is required is a balanced, rational judgement of justification based upon the information gathered.”¹³⁶
- 5.20 It has been suggested that the term “cost/benefit” is misleading, as “cost” refers to the harm done to the animals involved rather than to any financial cost. Parallels with cost/benefit analyses in financial contexts also suggest that the assessment is quantifiable, whereas in practice it is really a question of professional judgement. It has therefore been suggested that it should be renamed “harm/benefit”.
- 5.21 The assessment of harms and benefits is what gives the Act its flexibility, but also means that confidence in the Act is predicated on confidence in whoever carries out the assessment — usually the Inspectorate on behalf of the Secretary of State. Under the current system, Dr Hubrecht from UFAW considered that the projected benefits were sometimes exaggerated, while the projected harms to the animals over their entire life were not always taken into account (Q. 619). This view was supported by Dr Maggie Jennings from the RSPCA (Q. 612).¹³⁷ It is therefore important that the assessment is carried out in as transparent a manner as possible. It is important too that researchers do not rely on the Inspectorate, the ERP, the NVS or the NACWO to take animal suffering into account. Researchers must accept personal responsibility for the life-long welfare of their animals.
- 5.22 The APC is currently in the process of producing a report on the cost/benefit assessment, but we understand that this will not be available until the autumn of 2002.
- 5.23 Currently there is too little information on how decisions on cost/benefit are reached. It has been suggested that project licences should be made publicly available *before* they are approved, so that interested groups can suggest replacements, reductions and refinements, or point to similar research which has already taken place.¹³⁸ We consider that such a practice would only delay further the already lengthy licensing process. We do, however, consider that the public should be able to discover the principles on which the weighing of harms and benefits is done.
- 5.24 **We recommend that the substantive details of anonymised project licences, which describe the expected benefits of the research and harms to the animals involved, should be made public *after* they have been approved and funded.**
- 5.25 The Government have indicated that there are certain procedures which use animals which the Secretary of State will not permit. One of these is the use of animals for surgical training. At present, all applications to practise microsurgery on anaesthetised animals that are not allowed to recover have to go to the APC. All other applications to practise surgery are not permitted under the Act.
- 5.26 This seems to us to be misguided. We would far rather that surgeons carried out their first operations on terminally anaesthetised animals rather than on us, and assume that most patients share this view. The benefits likely to accrue from the acquisition of certain technical skills seem to be of far more immediate applicability to human and animal welfare than many of the justifications under which the use of animals is licensed. Surgeons often go to Canada or other countries to practise surgery on animals.¹³⁹ Such training should be licensed in the UK.

¹³⁵ Section 5(4).

¹³⁶ A Note on the Cost/Benefit Assessment is printed in the APC Annual Report for 1997, pp. 50–59.

¹³⁷ This is also one of the principal conclusions of the RSPCA report, “Non-Human Primates in Xenotransplantation Research in the UK” (June 2002), of which Dr Jennings is the principal author.

¹³⁸ BUAV (Q. 449). This is also discussed in the APC’s Report on Openness (2001), paras 32–33.

¹³⁹ This was said in the programme, “Frontline: Animal Research”, presented by Professor John Martin, British Heart Foundation Professor of Cardiovascular Medicine, University College, London (who also submitted written evidence). The film was originally broadcast on Channel 4 on 6 & 7 September 1995 and again on 17 March 1997. The MOD confirmed that surgeons did indeed go abroad to practise surgery on animals (Q. 1594).

- 5.27 **We recommend that the current restrictions on the use of terminally anaesthetised animals for training surgeons should be relaxed.**

Licence applications and bureaucracy

- 5.28 It is worth emphasising that the 1986 Act requires personal, institutional, and project licences. The UK is the only country to require an explicit cost/benefit assessment of every application to conduct animal research. All protocols are examined by the local Ethical Review Process and the Inspectorate; research proposals are also subject to peer review by funding bodies. All establishments are subject to frequent and stringent inspection.
- 5.29 Most scientists who conduct research on animals are content with these requirements. They take pride in the fact that the UK has rigorous ethical standards, and are aware that good animal welfare leads to good science. There has, however, been a substantial amount of criticism, not of the Act itself, but of the way in which it has been implemented and the associated delays.
- 5.30 In particular, complaints about the levels of bureaucracy relate to the time taken to process project licences and amendments to licences. The Expert Group on Efficient Regulation, chaired by Professor Iain Purchase, produced a report in October 2001 which compared the time taken to comply with comparable regulations in the UK, Germany, France and the United States.¹⁴⁰ Professor Purchase also submitted to this Committee a summary of the report which indicated that the total time taken to prepare a submission for approval and receive approval was 31 weeks in the UK, 17 weeks in Germany, and 6 weeks in the US.¹⁴¹
- 5.31 The effect of this bureaucratic burden in the UK is disputed. Many scientists argue that bureaucratic restrictions lead to research being hindered, abandoned or carried out abroad. This was supported by anecdotal evidence.¹⁴² Other witnesses countered that there was very little concrete evidence to support this view, and that other factors, such as the availability of good scientists, had far more effect on the siting of research.¹⁴³ The reality is hard to discover: bureaucratic delays do not force industry to move research out the UK, but they are a factor which affects decisions on where to site new research. As Dr Kipling from the ABPI said, “the key issue is the lost opportunities” (Q. 985). We do not wish the science base in the UK to be adversely affected by unnecessary bureaucracy.
- 5.32 Numerous witnesses acknowledged that the UK has the most tightly regulated system of animal procedures in the world. This is often said with pride, as if tight regulation intrinsically led to improved animal welfare. We do not agree. Bureaucracy in itself does not contribute to animal welfare. In fact, we have heard anecdotal evidence that bureaucracy can actively harm animal welfare. Witnesses from the Royal Society said that unnecessary standardisation of animals’ environments could lead to poor welfare, and that bureaucracy had led to experiments being carried out on three animals instead of on one.¹⁴⁴ Professor Blakemore gave the example that a minor amendment to use a new and superior anaesthetic took over three months for approval (Q. 972). Dr Matfield from the Research Defence Society said that amendments to licences had taken so long to be approved that research had become outdated and was therefore abandoned half way through — with the consequent unnecessary use of animals (Q. 928).
- 5.33 **We consider that the UK should strive not for the tightest regulation, but for the best regulation, properly enforced.**
- 5.34 Following discussions of the Pharmaceutical Industry Competitiveness Task Force in 2001, the Home Office agreed with industry a licensing time of 35 “clock days”.¹⁴⁵ The Home Office say that the great majority of licence applications are now processed within this time. This is a step in the right direction, and we commend the Home Office for improving their standards to this level. The DTI say that the Government are making progress towards solving

¹⁴⁰ *The Regulation of the Use of Animals in Scientific Procedures*, the Expert Group on Efficient Regulation (October, 2001).

¹⁴¹ French scientists considered that the question of approval was simply not relevant.

¹⁴² For example, Professor Clive Page from King’s College London spoke of emphysema research being carried out in the US rather than in the UK (Qs 871–73), and said that he had sent research students abroad on four recent occasions (Q. 874); Lord Winston spoke of carrying out research in the US due to a “scientific misunderstanding” by the Home Office (Q. 1835); see also memoranda by the Laboratory Animals Science Association and Professor John Martin.

¹⁴³ For example, the Royal Society (Q. 1035) and the DTI (paragraph 40 of the memorandum printed with their oral evidence).

¹⁴⁴ Professor Patrick Bateson and Dr Michael Festing (Q. 1039).

¹⁴⁵ “Clock days” are working days when the project licence is actually with the Inspectorate. If the licence needs to be returned to the applicant, days when the licence is with the applicant or in the post are not included.

- the problem of bureaucracy, but they also admit that there are a number of issues still to be reviewed, including the simplification of project licences.¹⁴⁶
- 5.35 The Home Office has been slow, for example, to develop a system to allow licences to be filled out and processed electronically. In evidence, officials from the Home Office indicated that they are now addressing this problem, although they would not say when such electronic processing would be possible (Q. 1896). This is not encouraging given past experience of the implementation of new computer systems.
- 5.36 We also consider that project licences are unnecessarily complicated. We have been permitted to see 5 project licences. The two shortest of these were between 40 and 50 pages long; the longest licence consisted of just over 300 pages. We understand that the Home Office is beginning a consultation with industry to see how these licences could be simplified, and we strongly support this. It is also clear that scientists themselves are partly to blame. The Royal Society said that applications from universities tend to be less well put together than those from industry (Q. 1042).
- 5.37 We still consider that, overall, the Home Office has not given enough consideration to the effects of bureaucracy on the science base in the UK. The amount of evidence we have received on the subject of bureaucracy is considerable, but is dismissed by the Home Office as anecdotal (Qs 1879-81). The Chief Inspector did not address the question of how minor amendments to project licences could be processed more quickly, but said that such amendments should not be necessary (Q. 1882).
- 5.38 The current attitude of the Inspectorate and the Home Office is insufficiently self-critical — they insist that the documentation works well, and that all delays and difficulties are the fault of those who fill in the application forms. The Inspectorate made what we consider to be an unhelpful distinction between “information” and “detail” on project licences. If, as the Chief Inspector said, too much superfluous detail is given, then licence applicants should be advised accordingly (Qs 1880–82).
- 5.39 We would like to see the Inspectorate taking responsibility for simplifying the licences, and clarifying exactly what is and what is not required. We consider that they could take a greater role in spreading best practice in licence applications.¹⁴⁷ We note that, in France, the average length of the equivalent licence is 10 pages, which for many projects we consider to be a reasonable length.
- 5.40 **We recommend that urgent consideration should be given by the Home Office to the simplification of project licences, with the aim of reducing the length of a typical licence to 10 pages.**
- 5.41 In addition, we consider that the system of approval of amendments to project licences needs to be streamlined. Some amendments are substantial, and should be subject to the same rigorous approval process as the initial licence application. Other amendments, however, are minor or routine, and in many cases either have no effect on animal welfare or have a beneficial effect on animal welfare. We discuss how the system of approval of such minor and routine amendments could be improved in the next chapter.

Training modules

- 5.42 All holders of personal licences under the Act are required to attend training modules.¹⁴⁸ Although one or two witnesses complained about these modules, they were not a matter of particular concern except in two areas: visiting scientists and students in higher education.¹⁴⁹
- 5.43 Visiting scientists, however experienced or well qualified, are required to complete training Module 1 — this lays out the historical background to the Act, gives an introduction to ethical aspects of the use of animals in scientific procedures, and explains the way in which the Act operates. Professor Blakemore said this was “a training and examination procedure that is designed for novices” (Q. 977) and that it was “a hindrance to Britain’s participation in the international business of research” (Q. 956); similarly, Professor Bateson of the Royal Society said “We are very worried about the slowness of that procedure...If we cannot get visitors to come here that is really going to affect UK research.” (Q. 1036)

¹⁴⁶ Paragraphs 22–23 of the memorandum printed with the DTI’s oral evidence.

¹⁴⁷ There are welcome signs that this is beginning to happen — see note by Professor Rothwell (p. 184).

¹⁴⁸ See Appendix F of the Home Office *Guidance on the Operation of the Animals (Scientific Procedures) Act 1986*.

¹⁴⁹ Professor Blakemore (Q. 956); and the Royal Society (Q. 1036).

- 5.44 The Chief Inspector was aware of the problem, but did not consider that the Home Office should be responsible for its solution.¹⁵⁰ As with a number of other issues, we consider that the Home Office would rather distance itself from problems than be proactive in finding and providing solutions.
- 5.45 We were told that a similar problem applied to students taking one year intercalated courses. By the time that they had received their licences there was scarcely time for them to do any research.¹⁵¹ In France, by contrast, students work under the tutelage of a Professor, who remains responsible for their actions and for animal welfare. We consider that this system should be extended.
- 5.46 **We recommend that visiting scientists and students in higher education should be allowed to carry out work under the licences of an established licence-holder, who would take responsibility for their actions and for the maintenance of animal welfare.**
- 5.47 **We recommend that scientists of whatever grade should have a personal responsibility for the welfare of the animals in their care.**

The Animal Procedures Committee

- 5.48 The Reverend Professor Michael Banner, the Chairman of the APC, summed up its role as: “an independent and expert body...charged under the Act with giving advice to the Secretary of State on his duties in relation to experimental animals. We can have issues referred to us by the Home Secretary, though that has been infrequent. Otherwise we undertake... as a rolling programme, a review of the various important elements of the Act and its operation” (Q. 3).¹⁵²
- 5.49 The APC is charged with keeping the Act under review. Professor Banner said that it has a “wide representation of nearly all viewpoints” (Q. 2). Members are unpaid, and the work of the APC is limited both by the availability of its members and by the limited resources of its secretariat. We have also heard that the APC cannot always obtain all the papers it needs to carry out its scrutiny role effectively.¹⁵³ The APC disburses £280,000 per annum for research into the Three Rs.
- 5.50 The APC has a very general function in considering controversial licence applications and in keeping the Act under review, but it has no executive authority and no clear lines of accountability. It is a committee looking for a role. We consider that it should take a more active part in monitoring the work of the Inspectorate;¹⁵⁴ and that it should continue to hold high level meetings to discuss questions of the validity of animal and non-animal tests. We hope, also, that the APC might help to keep matters raised in this report before Government.
- 5.51 In this report we make a number of recommendations where we envisage that the APC will take a greater role. It is likely to need more resources, and consideration should also be given as to whether members of the APC should be paid.¹⁵⁵
- 5.52 **We recommend that the secretariat of the Animal Procedures Committee should be strengthened and more clearly separated from the Home Office regulators.**

¹⁵⁰ Q. 1988 and Q. 1992.

¹⁵¹ Royal Society (Q. 1037 and Q. 1041).

¹⁵² See also para. 1.3(vii).

¹⁵³ Robert McCracken, paragraph 7.1 of the memorandum printed with his oral evidence.

¹⁵⁴ See paras 5.13-5.14.

¹⁵⁵ Currently, the Chairman of the APC receives an honorarium, but other members receive only expenses.

CHAPTER 6: THE ETHICAL REVIEW PROCESS

- 6.1 From 1st April 1999, all certificate holders in licensed establishments have been required to have in place an Ethical Review Process (ERP). The aims of the process are:
- (i) to provide independent advice to the certificate holder, particularly with respect to project licence applications and standards of animal care and welfare;
 - (ii) to provide support to the Named Veterinary Surgeon (NVS) and the Named Animal Care and Welfare Officer (NACWO), and advice to licensees regarding animal welfare and ethical issues arising from their work;
 - (iii) to promote the use of ethical analysis to increase awareness of animal welfare issues and develop initiatives leading to the widest possible application of the Three Rs.¹⁵⁶
- 6.2 The process has had many benefits. The ERP has enhanced the status of Named Veterinary Surgeons and Named Animal Care and Welfare Officers, and given them a platform to express their views. It has brought together expertise from across institutions to give advice on experimental design and the writing of project licences. ERPs are also encouraged, but are not required, to involve lay members.
- 6.3 The Home Office review of the ERP, published in November 2001, concludes that: “There is no doubt that the ERP has made a positive contribution to the production, care and use of animals for experimental and other scientific purposes”.¹⁵⁷
- 6.4 These benefits, however, come at a cost, and one which has not been fully recognised by the Inspectorate. In its review of the ERP prepared by the Inspectorate, the time taken to operate the ERP was dealt with in only the most cursory manner, and no attempt to quantify the opportunity and monetary costs was made.¹⁵⁸
- 6.5 Moreover, in their review the Inspectorate take a somewhat Panglossian view — that all is for the best in this best of all possible worlds. They recommend that the ethical review process statement issued by the Home Office should remain unchanged.¹⁵⁹ They say that flaws with the ERP are solely the fault of inadequate implementation by individual institutions, and they fail to acknowledge the complaints of scientists that “the Home Office provided little or no guidance on how ERP should be established”.¹⁶⁰

Role of the ERP

- 6.6 These early problems with the ERP are now beginning to be solved. Even those who remain sceptical about the overall value of the ERP acknowledge that: “ERP has undoubtedly brought benefits in ensuring high quality of training of scientists, and of animal welfare, greater involvement of NACWOs and has probably improved the quality and clarity of project licences overall”.¹⁶¹
- Nonetheless, we consider that the ERP is often an ineffective way of achieving these benefits.
- 6.7 At the moment, we consider that the ERP duplicates much of the work of the Inspectorate. This seems to be partly the fault of the scientists who use animals in research (as the Home Office suggests), and partly the fault of the Home Office (as many scientists suggest). Licensed establishments are required to have an ERP, a body of expertise to scrutinise project licences, but their remit is limited to amending and improving the licence application before it is submitted to the Inspector. The Inspector then carries out the cost/benefit assessment in exactly the same way as occurred before the introduction of the ERP.
- 6.8 We consider that better use could be made of the work already done by the ERP. At present, both new project licences and minor amendments are scrutinised by the ERP, who may require changes, scrutinised again by the Inspectorate, who may also require changes, and passed to the Home Office. Some controversial licences are then passed to the Animal Procedures Committee, other even more controversial licences are passed to Ministers, and

¹⁵⁶ These aims are set out in paragraph 3 of the Annex to the PCD Circular 3-4.98.

¹⁵⁷ *Review*, p. 13.

¹⁵⁸ Huntingdon Life Sciences estimate the annual cost of running an ERP to be £100,000 a year (p. 187).

¹⁵⁹ The statement is contained in Appendix J to the Home Office *Guidance on the Operation of the Animals (Scientific Procedures) Act 1986*.

¹⁶⁰ Professor Nancy Rothwell (p. 278).

¹⁶¹ *Ibid*.

- advice may be sought from independent assessors. Under the Act, all decisions on project licences have to be taken by the Secretary of State. In practice, these decisions are delegated to the Animal Procedures and Coroners Unit (APCU) in the Home Office (Q. 1963).
- 6.9 Project licences last for up to five years. This elaborate process of scrutiny may be appropriate for licences which last the full five years, and scientists are mostly content with the agreed processing time of 35 clock days. For routine or minor amendments, however, the processing time of 35 clock days, in addition to the time spent by the ERP, is considerable. This is not only frustrating for scientists, but has adverse consequences for animal welfare.¹⁶²
- 6.10 The Chief Inspector said that a move was gradually being made towards making project licences give “performance standards” rather than “engineering standards”.¹⁶³ Where licences are written to “performance standards”, the ERP examines each case to ensure that the standards are adhered to. We are in favour of moving towards this system, but the Home Office and Inspectorate need to issue guidelines on, and examples of, exactly what is required.¹⁶⁴ This may be an effective long-term strategy, but it seems unlikely that licences, however well drafted initially, will be flexible enough to incorporate all the advances and technological changes which may occur during the maximum five year duration of the licence. There is always likely to be a need for routine or minor amendments. The long term strategy also does not address the immediate concerns of processing amendments.
- 6.11 **We recommend that the Home Office should delegate interim authority to the local Ethical Review Process to approve routine or minor amendments.**
- 6.12 Under such a system, once the ERP had approved an amendment, it could immediately be implemented. Within a week, a retrospective notification would be given to the Home Office. The Inspectorate would monitor the performance and effectiveness of ERPs, as they do at the moment. Any ERP found to be operating unsatisfactorily could have its delegated interim authority to approve amendments suspended or withdrawn.
- 6.13 We envisage that the Inspectorate should draw up guidance on which amendments should be considered “routine or minor”. Such amendments might include: the use of a different strain (though not a different species), provided there was no significant additional detriment to animal welfare; improvements to animal welfare, such as environmental enrichment or the use of better anaesthetics; small changes in the number of animals used (for example up to 10%); and small changes to the procedures used to obtain samples or administer test substances.
- 6.14 The Chief Inspector said that empowering ERPs to make licensing decisions would require primary legislation (Q. 1910). We do not believe this to be true — in most instances decisions are already delegated from the Secretary of State to the Home Office. Moreover, we have heard that there is already scope for the granting of interim authorities to make changes to protocols.¹⁶⁵ Our proposal would simply extend this principle. We consider that this problem can be overcome if there is the political will to do so, especially as this recommendation, to slim down bureaucracy and stimulate research, is in keeping with recent policy statements by Government.
- 6.15 We consider that the rapid processing of routine or minor amendments has clear benefits, both in terms of improving animal welfare and in terms of reducing the burden of bureaucracy. We also consider that it will reduce the burden of trivial work on Inspectors. Lord Sainsbury noted the problem of excessive paperwork, which “was distracting the Inspectors from getting on and considering the animal welfare because people were spending a lot of time just processing the paper and ticking boxes” (Q. 1667). Animal welfare will be improved if Inspectors are given more time to make full use of their extensive expertise.
- 6.16 With this recommendation our intention is clear — to reduce the burden of unnecessary bureaucracy and associated costs and delays. We consider that this proposal will also have a beneficial effect on animal welfare, both by speeding up the implementation of amendments which improve animal welfare, and by preventing unnecessary animal use. We have no wish to impose further burdens on ERPs, the Inspectorate, or the Home Office. We emphasise that

¹⁶² See para. 5.32.

¹⁶³ Q. 1911. This distinguishes between specifying on the licence a quality standard to which all work will be done (“performance standard”), and specifying the exact procedures to be carried out (“engineering standard”).

¹⁶⁴ Professor Rothwell (p. 184).

¹⁶⁵ David Robb from Inveresk Research said, “I have been aware in the past of receiving verbal authority from an inspector to waive conditions on a project licence where the waiver was going to avoid the increased use of animals as long as that waiver was followed by a formal approach to amend the licence within a short period” (Q. 362).

these suggestions rely on a reasonable interpretation being made of “routine or minor” amendments. We do not intend to compromise animal welfare, but equally these recommendations will have no effect if the Home Office defines “routine or minor” amendments to include only the most trivial of changes. It may well be that any changes are best made by operating pilot schemes, or by gradually extending the definition of “routine or minor”. We have made what we consider to be realistic and practical suggestions for dealing with a problem presented to us by many witnesses. It is up to the Home Office to consider these recommendations in the spirit in which they are made, and make a clear commitment to operating the Act as effectively and efficiently as possible.

Membership of the ERP

- 6.17 In order to ensure that ERPs are of sufficiently high standard, and to maintain public confidence in the regulatory system, we consider that ERPs should be strengthened.
- 6.18 Each ERP should include at least one lay member who should be totally external to the institution. The advantages of lay membership are clear. Lay members, as outsiders to the scientific community, can ask fundamental questions about justification which scientists might pass over as being seemingly too obvious to need justification. They can represent ethical viewpoints which those who are immersed in science might not normally consider. Lay membership allows a form of public scrutiny which should contribute to greater openness and a more rounded assessment of animal research.¹⁶⁶
- 6.19 Many ERPs currently have lay membership, but such members are frequently non-scientific employees in the same institution. If lay members are to be effective in their role of scrutinising project licences, then they need to be able to express freely opinions which scientists may find uncomfortable. A lay member employed by an institution may not be in a position to criticise colleagues as rigorously as might be desirable. This is not to suggest that any conscious pressure has ever been brought to bear on any individual; it is however undesirable that a lay member should be under even sub-conscious pressure not to be as frank as possible and for self-censorship to operate.
- 6.20 Most of our witnesses were in favour of lay membership in principle, though a number said that lay members were difficult to find in practice.¹⁶⁷ We recognise that finding such lay members is not always easy. Nonetheless, lay membership of Institutional Animal Care and Use Committees is already obligatory in the US (where many lay members are lawyers or ministers of religion) and there seems to be no good reason why it should not also be possible in the UK. We note that many UK establishments already have external lay members on their ERP. This good practice has been encouraged by the Home Office for some time. We consider that encouragement alone has not been effective.
- 6.21 **We recommend that each Ethical Review Process should be required to have an external, lay member, whose term of office should be time-limited.**

¹⁶⁶ The advantages of lay membership are recognised by many witnesses, including the Boyd Group (p. 45); GlaxoSmithKline (p. 156); the Royal College of Obstetricians and Gynaecologists (p. 280); the University of Birmingham (p. 338); and the Wellcome Trust (p. 354).

¹⁶⁷ For example, the Research Defence Society (Q. 934) and the MOD (Q. 1624).

CHAPTER 7: THE THREE RS: ALTERNATIVES TO ANIMAL EXPERIMENTS

- 7.1 The Three Rs — reduction, refinement, and replacement — form a framework for the minimisation of pain, suffering, distress and lasting harm in animal experiments. They are widely accepted as a guiding principle by the majority of scientists and many anti-vivisectionists.¹⁶⁸
- 7.2 The Three Rs are often referred to collectively as “alternatives”. Although this term is in current use, a number of witnesses said that it was misleading.¹⁶⁹ To the public, the term “alternative” suggests the replacement of an animal experiment, not simply a reduction in the number of animals used, or the refinement of an experimental protocol.
- 7.3 Some anti-vivisection groups were also unhappy with the concept of the Three Rs. Those who are fundamentally opposed to animal experiments consider that replacement is the only “R” worth arguing for.¹⁷⁰ Refinement and reduction, they argue, merely serve as a smokescreen to allow scientists to continue to experiment with animals. Other animal groups, however, such as UFAW, argued that animal experiments are unlikely to stop completely for some considerable time. Given that situation, such groups maintain that animal welfare and animal rights groups should focus on practical matters of reducing pain and distress. They argue that there is considerable scope for minimising animal suffering, and the preoccupation with “replacement” is not to the ultimate benefit of the animals involved.
- 7.4 It is unrealistic to suppose that we can change the use of the word “alternatives”. We do not consider however that the word “alternatives” should be replaced solely by the word “replacements”. Both long-term and short-term gains in animal welfare are important — that is to say, effort should be made to find replacements, but also reductions and refinements.
- 7.5 In considering the question of the use of animals in scientific procedures, we have been persuaded that benefits do arise from animal experiments. We are not, however, persuaded that enough effort is always made to avoid the use of animals. We are similarly not persuaded that where this is not possible, sufficient effort is always made to minimise the number of animals used, and to minimise the pain and suffering inflicted on each animal.
- 7.6 The justification for the use of animals in scientific procedures hinges on such procedures being necessary. It is therefore important that all possible steps are taken to implement the Three Rs.
- 7.7 This is important for reasons of animal welfare. It is also important for reasons of good science. Replacement *in vitro* tests tend to produce less variable results than animal tests. Better welfare leads not only to more contented animals, but can make animals better models for human disease — a recent paper shows that “Environmentally enriched mice may actually mimic human disease more accurately”.¹⁷¹
- 7.8 Public confidence that only necessary animal research is carried out relies in part on the effective development and use of the Three Rs. Equally, scientists who experiment on animals need an up-to-date understanding of ethology (how animals behave in their normal environment), including expressions of pain in particular species, in order to implement appropriate refinement techniques. Steps to minimise animal suffering need to be taken, and need to be seen to be taken. Only if efforts are continually being made to reduce, replace and refine animal experiments can scientists who rely on animal experimentation expect to gain and retain public confidence.
- 7.9 We recognise that, to date, most advances in the Three Rs have been made by scientists in the course of their work. We have also seen that most of those who work using animals take great care of them and are concerned for their welfare. Particularly following the introduction of the ERP, it seems to us that reduction, refinement and replacement techniques which have already been developed are implemented. The question remains as to who will take responsibility for developing new techniques in the Three Rs. Scientists have many pressures on their time, and on their budgets. Without any specific focus on their implementation we do not consider that the development of the Three Rs is likely to proceed at a satisfactory rate.

¹⁶⁸ See *The Three Rs* para. 1.12.

¹⁶⁹ For example, Animal Aid (p. 2).

¹⁷⁰ For example, the Dr Hadwen Trust (Q. 457).

¹⁷¹ Dr E. Hockly et al., “Environmental Enrichment Slows Disease Progression in R6/2 Huntington’s Disease Mice”, *Annals of Neurology*, 51 (2002), pp. 235–42, p. 235. The abstract of this paper is reprinted as part of the DoH’s memorandum following their oral evidence.

Use and development of the Three Rs

- 7.10 Under the 1986 Act, no animal procedure can be licensed where there exists a “reasonably practicable method not entailing the use of protected animals”.¹⁷² The Act also requires researchers to incorporate reductions and refinements wherever possible.¹⁷³ Virtually all our written submissions made reference to the use and development of alternatives to animal experiments, and in particular to the Three Rs of reduction, refinement and replacement.
- 7.11 Scientists said that consideration of the Three Rs was an integral part of planning research using animals. The project licence form requires the applicant to demonstrate that the Three Rs have been considered. Funding bodies also require that non-animal methods receive due consideration.¹⁷⁴ Scientists said that replacements, reductions and refinements are continually developed by scientists themselves in the course of their work. They argued, as we have already noted (see para. 4.10), that scientists have made considerable progress in reducing the numbers of animals used.
- 7.12 Those opposed to vivisection, however, were highly sceptical that scientists took the Three Rs sufficiently seriously. They asserted that scientists enthusiastically endorsed the Three Rs as a way of ensuring that they were seen to be taking animal welfare seriously, even though, in practice, very few changes to standard animal research practice were ever made. Professor Balls, from the European Centre for the Validation of Alternative Methods said that the support for the Three Rs from the scientific community is “often rather shallow” (Q. 1451). Dr Goldberg, from Johns Hopkins University, said that scientists did not look for the Three Rs enough, as they had not been trained to do so (Q. 1532).
- 7.13 We welcome the progress which has already been made by the science community, but there seems to us to be scope for further work to develop methods involving the Three Rs. Many scientists have insufficient time to spend on the Three Rs, and we did not consider that there was a consistent consideration of them.¹⁷⁵ We also consider that there is inadequate recognition for the work of scientists in this field.¹⁷⁶
- 7.14 Scientists are required by the Act to use existing replacement, reduction and refinement techniques, but even where existing Three Rs are incorporated into scientific thinking, there seems to be little onus on any individual to search actively for new ways to improve animal welfare. Moreover, while there may exist a financial incentive to develop replacements and reductions (in terms of reducing the costs of obtaining and keeping animals), there is less incentive to develop refinements.¹⁷⁷
- 7.15 Refinements are often as simple as incorporating environmental enrichments into existing procedures. However, before such enrichments can be incorporated, more research needs to be undertaken to demonstrate that the enrichment (such as the provision of nesting material or toys in cages, or even solid cage bottoms) will not interfere with the results, and prevent comparison with existing data. The science community has had little incentive to undertake such research as its first concern is with the validity and reliability of its existing methods, and validation of new enrichment techniques costs money. Such studies are beginning to be done, especially as it is now coming to be recognised that enrichment techniques can improve the validity of animal experiments.¹⁷⁸ We consider that this sort of work needs more encouragement.
- 7.16 In May 2001, the MRC established a Centre for Best Practice for Animals in Research to develop and disseminate information and guidance on the Three Rs. This is a welcome beginning, but its focus is on animal welfare and good practice — it has no specific mandate to look for replacement alternatives. Currently, it is only available to holders of MRC grants. We consider that this idea should be built upon to create a new initiative.

¹⁷² Section 5(5)(a).

¹⁷³ Section 5(5)(b).

¹⁷⁴ Wellcome Trust (Q. 1427), and MRC and BBSRC (Q. 743).

¹⁷⁵ Lord Winston said that scientists “may well have turned a blind eye many times to alternatives” and “that may be still happening in the use of animals”. He continued, however, that it happened much less than it used to and that many organisations had changed their attitude (Q. 1866). The RSPCA also acknowledged that some organisations had responded well to developments in the Three Rs, but said that there was no “long-term, global, strategic commitment to replace animals” (p. 294).

¹⁷⁶ See para. 4.12.

¹⁷⁷ Dr Dexter from the Wellcome Trust noted that most of the funding applications received were for replacement (Q. 1422).

¹⁷⁸ “Environmental enrichment” paper by Hockly et al. (see footnote 171).

Centre for the Three Rs

- 7.17 We recognise that many new techniques related to the Three Rs have been developed by scientists in the course of their work. We consider that there is a need for further impetus to support and encourage them to be innovative. In taking evidence, we heard that there is very little support for the idea of an independent research laboratory which would itself develop new experimental or toxicological techniques related to the Three Rs. We recognise that research into the Three Rs needs to be integrated into traditional science. Only by embedding such research into existing scientific structures will the necessary expertise become available.
- 7.18 **We recommend that a Centre for the Three Rs be set up, consisting of a small, administrative hub which co-ordinates research units embedded in existing centres of scientific excellence.**
- 7.19 In making this specific recommendation we have been particularly influenced by our visit to the Center for Alternatives to Animal Testing (based at Johns Hopkins University in the United States), the evidence we received from ECVAM and the OECD, and the conference we held towards the end of our evidence gathering with representatives from industry, funding bodies, and animal welfare and rights groups.¹⁷⁹
- 7.20 The form of this “Centre”, a collection of small, devolved units, is crucial. We envisage that the administrative hub would be a portal to relevant databases, provide a forum for sharing information, help to prevent duplication of animal research, and possibly include a database of “negative results”.¹⁸⁰ It might co-ordinate existing funding for the Three Rs which is already provided by Government, charities and industry. It should also be a resource for researchers to provide reliable, validated information on the Three Rs.¹⁸¹ It could encourage and co-ordinate research on animal pain and cognition, and use the results of such research to provide better standards of accommodation and care. It could promote conferences, and act as a focal point for efforts to lobby appropriate international bodies.
- 7.21 The hub would co-ordinate small research groups with different specialisations incorporated into existing research centres at universities and medical schools. These small units would draw on existing expertise in research centres, and act as drivers to incorporate research into the Three Rs into the everyday business of research science. We consider, for example, that one such group should be sited in the MRC’s own laboratories, in order to complement their excellent initiative of a Centre for Best Practice for Animals in Research.
- 7.22 The centre should be jointly funded by Government, charities and industry. As the NAVS observe, such a centre would also provide a respected and official focus for public charitable giving. The public might be surprised to learn that the Home Office budget dedicated to searching for the Three Rs in animal experiments is a meagre £280,000 per annum. Even the more optimistic figure, given by the Home Office, that across all departments the Government spend £2 million per annum (Q. 174), is small in comparison with the £6 billion spent annually on medicines by the Department of Health.
- 7.23 **We recommend that the current Animal Procedures Committee research budget of £280,000 should be given to the Centre to disburse. We further recommend that the Centre should co-ordinate the Government spend on the Three Rs across all departments. A Centre would also require further funding from Government, industry, and animal welfare charities.**
- 7.24 The obvious objection to the setting up of such a centre is cost. Costs do not exist in a vacuum, and we recognise that new money spent by Government on a centre for the Three Rs could otherwise be spent on new research. The argument can be characterised as, “Why should the Government spend considerable amounts of money on keeping a few activists happy when it should be funding a cure for cancer?”
- 7.25 The principal justification for such a centre is that all sides of the debate on animal procedures say that animals are highly imperfect models. It will be for the benefit of science, and ultimately of human health, if better methods of research and testing could be developed. Another reason has already been discussed — the justification for the use of animals is predicated on the elimination of unnecessary animal use. Public opinion in the UK is also

¹⁷⁹ The report of the conference’s Working Group on a Centre for the Three Rs is in Appendix 4.

¹⁸⁰ We note that there are plans to launch an on-line *Journal of Negative Results in Biomedicine* later this year (*Nature*, 27th June 2002, p. 891), and envisage that something similar, focusing on animal experiments, should be feasible.

¹⁸¹ Lord Winston noted that “Anywhere that could give scientists the information on the possible alternatives to using animals would be really helpful” (paragraph 7 of the memorandum printed with his oral evidence).

only in favour of animal research where it is absolutely necessary and suffering is kept to a minimum.

- 7.26 We consider that a Centre will encourage more research into the Three Rs and build on the considerable amount of research which is already undertaken by the scientific community. We also consider that a Centre will demonstrate in the clearest way possible that steps really are being taken to minimise animal use, and minimise the infliction of “pain, suffering, distress or lasting harm”.

Other ways to promote the Three Rs

- 7.27 We recommend that the following suggestions to promote the use and development of the Three Rs should also be considered.
- 7.28 Funding bodies should encourage applicants who propose using animals in their work to state what developments in the Three Rs each application incorporates.
- 7.29 Academic and professional journals should agree a standard set of keywords for articles relating to research on the Three Rs, so that relevant articles can more easily be found in databases.¹⁸²
- 7.30 Journals should encourage contributors to include information on how the Three Rs are developed or used in their research. Given the limited space in journals, this information could be made available on the web.

¹⁸² The MRC’s Centre for Best Practice has indicated that it is considering this.

CHAPTER 8: GENETICALLY MODIFIED ANIMALS

- 8.1 A genetically modified (GM) animal is one whose genetic make-up (its DNA) has been changed using the technologies of genetic engineering. In some cases genes are moved from one species (for example, a human) to another (normally a mouse). In other cases one or more genes that would normally be found in a species are removed. The most commonly used method of genetic engineering is microinjection — the injection of foreign DNA into a fertilised egg under a microscope.¹⁸³ The creation and use of genetically modified animals is regulated by the 1986 Act.¹⁸⁴
- 8.2 At present, the principal uses of GM animals are in basic scientific research, typically to understand more about the functioning of human genes. It is hoped by those who advocate such research that this will lead to advances in human and animal medicine.¹⁸⁵
- 8.3 The overwhelming majority of GM animals used in the UK are mice. Of the 581,740 procedures on GM animals counted in the 2000 *Statistics*, 575,160, or nearly 99%, involved mice.¹⁸⁶ Other GM animals counted were rats, rabbits, ungulates, birds, reptiles, amphibians and fish. There were no procedures on GM cats, dogs or primates.
- 8.4 While the total number of animals used in scientific procedures has remained fairly static over the last few years, the proportion of GM animals used has dramatically increased. In 1995, 215,300 procedures on GM animals were included in the Home Office *Statistics* (8% of the total); in 2000, 581,740 procedures on GM animals were included (21% of the total).¹⁸⁷ Most of our witnesses considered that this trend of an increase in GM animal use would continue. We note, however, that the number of GM animals actually used in research programmes is far below the number recorded by the *Statistics*. We return to this below.
- 8.5 Some witnesses raised concerns about the technology of genetic modification as applied to animals. Mice, for example, are often genetically engineered with the express intention of breeding animals which develop cancers and other diseases. Witnesses argued that the process of genetic modification is imprecise and cannot be exactly targeted. This not infrequently leads to the creation of malformed fetuses and offspring. They also argue that genetic modification is inherently different from “traditional” methods of selective breeding.¹⁸⁸
- 8.6 Other witnesses have argued that GM animals have great potential to advance scientific understanding and human well-being.¹⁸⁹ GM animals can be used to research links between genetics and disease. Witnesses also argue that GM animals can be better models than non-GM animals for human diseases and their treatment. The production of genetically engineered mice should aid research against a wide range of diseases such as muscular dystrophy, sickle-cell anaemia, Alzheimer’s disease, atherosclerosis and various cancers. The production of the human protein alpha-1-antitrypsin by sheep may help people with cystic fibrosis or emphysema. We also note that the development of certain strains of GM animals may help to introduce refinements: for example, GM mice are being developed to replace primates in testing polio vaccine (Q. 870).
- 8.7 There is already a burgeoning literature on genetic engineering, which has been a highly controversial subject across Europe. There are also a number of reports about the use of GM animals. ECVAM produced a report of a workshop *The Use of Transgenic Animals in the EU* in 1998.¹⁹⁰ In May 2001, the Royal Society produced a report on the use of GM animals which concluded that:

¹⁸³ See the Animal Procedures Committee *Report on Biotechnology* (June 2001) pp. 8–9; available at www.apc.gov.uk/reference/biorec.pdf (at July 2002).

¹⁸⁴ In addition, in the UK any laboratory involved in genetic modification must be registered under the Genetically Modified Organisms (Contained Use) Regulations 2000. These require all work with GM animals to be subject to a risk assessment for effect on human health and safety. The Environmental Protection Act 1990 requires that anyone keeping GM animals must carry out an assessment of the risks to the environment, which must include hazards arising from the escape of the animals and the risk of such hazards occurring.

¹⁸⁵ See APC *Biotechnology* report, pp. 32–35.

¹⁸⁶ *Statistics*, Table 3.3.

¹⁸⁷ Home Office *Statistics*, p. 91.

¹⁸⁸ See memoranda by FRAME (p. 152), the NAVS (pp. 242–44), and the RSPCA (para. 305).

¹⁸⁹ See the Wellcome Trust (p. 356) and the report by the Royal Society, *The Use of Genetically Modified Animals*, Policy Document 5/01 (London, 2001).

¹⁹⁰ Available at <http://altweb.jhsph.edu/publications/ECVAM/ecvam28.htm> (as at July 2002).

“the development of GM animals has been hugely beneficial in many areas...but serious concerns remain about welfare and health and safety issues”.¹⁹¹

- 8.8 Just one month later, in June 2001, the Animal Procedures Committee produced a report on Biotechnology.¹⁹² The APC considered that GM animals did not need new legislation, but did require special consideration under the Act, particularly with regard to welfare.¹⁹³ We note that, after a year, the Government have still not responded to the recommendations of that report. Also in 2001, the Department of Health looked at infection risks in xenotransplantation.¹⁹⁴ The Agriculture and Environment Biotechnology Commission is due to report on animals and biotechnology in September 2002.¹⁹⁵ There have also been a number of reports by Non-Governmental Organisations which have been critical of the development and use of GM animals.¹⁹⁶ In the light of the rapid pace of development across the whole field of GM animals, the Committee has not felt it appropriate to produce yet another detailed review of an area which will soon move on. Instead, we confine ourselves to two general points.
- 8.9 The first is that, from the point of view of the 1986 Act, an important question is whether a new strain (or variety) of GM animal is “normal” from a welfare point of view — that is, it suffers no more than do ordinary animals of the species. If the GM strain is in this sense normal, then no special regulations under the 1986 Act should apply. Our witnesses disagreed over the extent to which GM animals suffered. Moreover, we note that some animals created by traditional methods of selective breeding also suffer: Dr MacArthur Clark from FAWC said that “selective breeding of poultry...has now resulted in a bird that is likely to be clinically lame by the time it is eight weeks old” (Q. 1092). In the reports by the Royal Society, the APC and others, there is at least a consensus that there is not enough information about the actual levels of suffering, if any, experienced by GM animals.
- 8.10 We endorse the emphasis of the APC report, that much better information on the welfare of GM animals needs to be obtained. Such a preliminary assessment would be made by the first users of the strain (the project licence holder, the Named Veterinary Surgeon and the Named Animal Care and Welfare Officer) and monitored by the Inspectorate.
- 8.11 The Inspectorate already advise on cost/benefit decisions involving GM animals. In order to perform this function, Inspectors need to have a sense of whether a particular GM animal is in pain or suffering: this is required for the full “cost” element in the cost/benefit analysis to be taken into account. Inspectors must therefore already be carrying out some form of assessment of any pain or suffering inherent in a strain of GM animal.
- 8.12 **We recommend that a welfare assessment of all new strains of animals used in experiments (whether produced by new technologies or by more traditional methods) should be made as a matter of course.**
- 8.13 The second general point we wish to make concerns the recording of GM animals in the annual *Statistics*.¹⁹⁷ Of the 581,740 procedures included in the 2000 *Statistics*, only in 118,551 procedures were animals actually used in scientific research programmes.¹⁹⁸ The breeding of any GM animal is currently classified as a scientific procedure, even though many animals suffer no adverse welfare implications as a consequence of the genetic modification.

¹⁹¹ *The Use of Genetically Modified Animals*, p. viii. This report was not universally welcomed: for one critique see Dr. Mae-Wan Ho, Director, Institute of Science in Society (p. 215).

¹⁹² See footnote 183 above. See also the review, ‘A Critique of the Animal Procedures Committee Report on Biotechnology’, *Alternatives to Laboratory Animals (ATLA)*, 30 (2002), pp. 131–34, which is largely favourable, though makes the criticism that ethical frameworks for considering GM animals are not considered.

¹⁹³ Of the 24 recommendations made by the APC, 16 make reference to the assessment or consideration of animal welfare.

¹⁹⁴ Muir, D. A. & Griffin, G. E. (2001) *Infection Risks in Xenotransplantation*: Prepared for the Department of Health, London. “Xenotransplantation” is the replacement of an organ in an individual by the equivalent organ taken from another species. Experiments on xenotransplantation are regulated by the 1986 Act. Clinical and regulatory issues relevant to xenotransplantation are kept under review by UKXIRA (United Kingdom Xenotransplantation Interim Regulatory Authority).

¹⁹⁵ The latest version of the draft prepared by the Sub-Group is available at www.aebc.gov.uk

¹⁹⁶ For example, by GeneWatch UK (Rutovitz, J. & Mayer, S. (2002) *Genetically Modified and Cloned Animals. All in a Good Cause?*) and Compassion in World Farming (Turner, J. (2002) *The Gene and the Stable Door: Biotechnology and Farm Animals*).

¹⁹⁷ See further discussion of the *Statistics* in Chapter 9.

¹⁹⁸ See Table 3.3 of the *Statistics*, and para. 9 of this report.

We agree with the MRC (Q. 722) that animals which are not subject to “pain, suffering, distress or lasting harm” should not be included in the published *Statistics*.¹⁹⁹

- 8.14 We consider that the current practice of including in the *Statistics* all GM animals which are bred, whether they have adverse welfare implications or not, is misleading. If only the animals actually used in research programmes were counted, the total number of animals, including GM and normal, reported as having been used in the *Statistics* would have fallen over the last few years. We consider that the headline figures of the number of animals used or procedures undertaken which are given in the annual *Statistics*, are therefore misleading.
- 8.15 The Inspectorate told us that certain strains of GM animals can be excluded from the *Statistics* if they can be proved to be normal (Q. 1950). We consider that the welfare of all GM animals needs greater attention, but that, as a corollary, those animals which are assessed as having no immediate welfare implications should be removed from the aegis of the Act.
- 8.16 **We recommend that animals from genetically modified strains which are bred but not otherwise used in regulated procedures should be excluded from the Home Office *Statistics*, provided they have no characteristics with adverse welfare implications.**

¹⁹⁹ This opinion is endorsed by, among others, the Physiological Society (p. 260), and Professor J. M. W. Slack, University of Bath (p. 338).

CHAPTER 9: PUBLIC INFORMATION

- 9.1 **We consider that the availability to the public of regularly updated, good quality information on what animal experiments are done and why, is vital to create an atmosphere in which the issue of animal experimentation can be discussed productively.**
- 9.2 In 2000, the Science and Technology Committee of the House of Lords published *Science and Society*, a report on the relationship between scientists and the public.²⁰⁰ This report concluded that there was a “crisis of trust” between scientists and the public. It also noted that there had been “a cultural change in the attitude of most British scientists, in favour of public outreach activities”.²⁰¹
- 9.3 This “crisis of trust” is particularly apparent in the debate surrounding the use of animals in scientific procedures. Some of the reasons for this are applicable over a variety of scientific fields: people are more questioning of authority; some Government departments and institutions still operate under a culture of secrecy, although others are now becoming much more open; some scientific issues have in the past been framed so as to exclude consideration of moral, social and ethical issues.²⁰²
- 9.4 Other reasons are particular to the debate concerning animal experiments. It has long been a cliché that the English care more for their pets than they do for their children — England has a Royal Society for the Prevention of Cruelty to Animals, but only a National Society for the Prevention of Cruelty to Children. The UK, and particularly England, is an increasingly urban society where animals are encountered only as pets. Most people are divorced from the process of food production, and have virtually no contact with farm animals. This is particularly true of children, some of whom have little idea of the origins of their food.²⁰³
- 9.5 By contrast, in France we were told that the public is much less concerned with animal experiments. This enables scientists and regulators to engage better with activists. The Veterinary Inspectors not only had an open and constructive dialogue with animal welfare groups, but welcomed contributions from such organisations.²⁰⁴ We encourage the Home Office and Inspectorate to involve responsible animal welfare groups in their work in a similar way.
- 9.6 In the UK the public has too little good quality information on all aspects of animal experimentation. Sentimental and sometimes misleading information is disseminated by some anti-vivisection groups. Too little information is given to the public from other sources. Many of those who use animals are reluctant to admit to doing so, and over the past year we have noted that reports in the press of new drugs rarely mention that animals have been used in their development. The long-term answer to this problem of lack of information is better education. This is more difficult as there has also been a decline in the use of living organisms, including animals, in schools in England over the last 20 years.²⁰⁵
- 9.7 Better education in this area requires more than the provision of information and appropriate practical work. Students, especially those in higher education, should be encouraged to think about ethical issues, including the use of animals in science. Such teaching might parallel the way in which medical students now undertake courses on medical ethics. Some courses already consider ethical questions, and we consider that examples of good practice in this area should be encouraged.²⁰⁶
- 9.8 One reason for the lack of good quality information from different sources is that those who use animals are reluctant to speak up and explain what they do and why they do it. As Professor Blakemore said:

²⁰⁰ Third Report, Session 1999–2000, HL Paper 38. This is available from The Stationery Office or from the parliamentary web-site www.parliament.uk

²⁰¹ *Science and Society*, p. 6.

²⁰² *Science and Society*, p. 5.

²⁰³ Huntingdon Life Sciences (Q. 335).

²⁰⁴ See note of the visit to France in Appendix 3.

²⁰⁵ The Wellcome Trust (Q. 1434) and the Royal Society (Q. 1077). See also the Third Report of Session 2001-02 of the House of Commons Science and Technology Committee *Science Education from 14 to 19* (HC 508), which discusses resources for practical science. There is now a wide range of educationally valuable activities which can be undertaken with animals in primary and secondary schools and in colleges and universities without causing any animal suffering, and we encourage such activities (see, for example, Reiss, M. J., ed. *Living Biology in Schools*, Institute of Biology, London, 1996).

²⁰⁶ Professor Rothwell (Qs. 703–04).

“The problem is fear, and with very good reason. People are very scared to put their heads above the parapet because of the threats of intimidation and violence.” (Q. 966)²⁰⁷

The activity of violent animal rights campaigners is detrimental to animal welfare. It stifles debate and prevents constructive communication between scientists and moderate animal welfare groups. We consider that progress on the Three Rs can be made more effectively if there is good communication between all those involved in the debate on animal experiments.

9.9 To overcome this problem, it is important for animal welfare groups to disassociate themselves from the intimidatory activities of the minority. It is also important for research scientists to make efforts to reach out to the wider public. The Government have already taken a lead on this. They have spoken publicly in support of animal experimentation in academia and industry, and have taken steps to counteract threats by animal extremists. We note that the ABPI, for example, are now satisfied that the issue is being addressed by Government.²⁰⁸

9.10 The threat of intimidation is not, however, the only obstacle to providing better information to the public. The benefits of animal procedures are not always immediately apparent, and many scientists are poor communicators. The Inspectorate have noted that some scientists “seemed reluctant to accept that the ERP would require a scientifically sound, clear and sustainable justification for the work they wished to undertake”.²⁰⁹ This attitude is not productive. We consider that scientists should take a more active role in explaining their work to the public, and should be encouraged to think about their work in a wider context. We endorse, with particular reference to animal experiments, the conclusion on page 6 of *Science and Society*, that

“communication training offered to research students should be broadened to include an awareness of the social context of their research and its applications”.

Professor Rothwell told us that there was already a module for science graduates in public communication at the University of Manchester (Q. 706). We consider that this is an excellent initiative which should be adopted by other universities.

Section 24

9.11 Section 24 of the 1986 Act, sometimes called the “confidentiality clause”, has been criticised by a number of witnesses.²¹⁰ It states:

“A person is guilty of an offence if otherwise than for the purpose of discharging his functions under this Act he discloses any information which has been obtained by him in the exercise of those functions and which he knows or has reasonable grounds for believing to have been given in confidence.”²¹¹

9.12 We note that Section 24 of the Act is already under review by the Home Office. Angela Eagle MP, who was the Home Office Minister when she gave evidence on November 13th 2001, had hoped that the results of this review would have been announced long before this summer (Q. 560). The results of the review have not yet been made public.

9.13 We consider the current levels of secrecy surrounding animal experiments to be excessive. Difficulties in obtaining information do not only apply to the public: the APC has had trouble obtaining some documents; we, too, were only allowed to see five project licences after they had been anonymised.

9.14 From the evidence we have received, we consider that there should be a presumption in favour of information being publicly available. The lack of information on animal procedures is cited by animal rights and animal welfare groups as being unreasonable, as it prevents them from challenging any decisions made by the Home Office. Secrecy also contributes to public disquiet with animal experiments, as scientists and others are not seen to be held accountable.

²⁰⁷ See also Lord Winston (Q. 1855); the Medical Research Council (p. 220); the Laboratory Animals Science Association (pp. 209–10); the Laboratory Animals Veterinary Association (p. 212); and many others.

²⁰⁸ Q. 987. Other bodies have been less robust than Government. We note the pusillanimity of a number of financial institutions who have adopted a narrow and short-term view in failing to stand up to this form of violent intimidation (Q. 1510). Such behaviour is not new. Following the Gordon riots in London in 1780, Samuel Johnson commented on the “cowardice of a commercial place” (Peter Ackroyd, *London: the Biography* (London, 2000), p. 490). Things appear not to have changed greatly since.

²⁰⁹ *The Review of the ERP*, p. 11.

²¹⁰ NAVS (p. 236); BUAV (pp. 85–86); Naturewatch (p. 245); and the RSPCA (p. 300) among others.

²¹¹ Sub-section (2) goes on to state the penalties for such an offence.

- 9.15 The debate currently centres around what information should be released and made public. We consider that this approaches the question from the wrong direction. There should be a presumption in favour of complete openness, and consideration should then be given as to what information should remain confidential. This would be in line with the provisions of the Freedom of Information Act 2000.
- 9.16 We recognise that the personal details of researchers need to be kept confidential for reasons of safety. No witnesses demanded that these should be made public. The NAVS, for example, specifically said that this information was “not necessary”.²¹² Similarly, we consider that information should not be made public which would compromise intellectual property rights or commercial confidentiality.
- 9.17 We consider that the debate surrounding animal experiments has been stifled for too long, and with damaging results, by the overly restrictive nature of the Act. We consider that the justification should have to be made, by the scientific community, for each class of information which it considers should remain confidential. This may well result in much of the information that is currently confidential remaining confidential. As a point of principle, however, we consider that the “burden of proof” should be reversed.
- 9.18 **We recommend that Section 24 should be repealed. Specific justification should then be made for each class of information that needs to be kept confidential, such as the identity of researchers and matters of commercial confidentiality and intellectual property.**

A new discussion forum

- 9.19 Towards the end of our Inquiry, we held a one day conference in the House of Lords to discuss some of the key issues arising from the evidence we had heard.²¹³ A number of delegates said that they considered this a highly worthwhile occasion, and we too believe that this conference was successful. Agreement was not, of course, reached on every point, but there was a surprising degree of consensus across a range of issues relating to animal experiments. Even those groups who did not usually participate in such discussions attended this conference, as they said that they were willing to participate in a forum where they did not have to accept, *a priori*, that they agreed to the continuation of animal experiments. We consider that such fora are a constructive way to continue the debate — much more constructive than trading one-sided articles in the press.
- 9.20 Some individuals in industry and academia have made a concerted effort to hold open debates on the need for animal experiments. One forum, the Boyd Group, has made considerable efforts to include all aspects of the debate in its work, and over the past ten years has produced a number of consensus papers which have sought to move the debate forward.²¹⁴ Some anti-vivisection groups have, however, refused to participate in discussions. The Boyd Group seems to have done much good work and still has a role in exploring contentious areas. But participants cannot be coerced into constructive debate, and we consider that a new forum is also needed.
- 9.21 We note that the APC already holds high-level talks which include scientists who are in favour of animal experiments as well as scientists who are against them. We strongly encourage this. We further consider that there should be regular discussion meetings involving all sides of the debate, hosted by the Inspectorate. These meetings should address topics, such as the use of mouse models in cystic fibrosis, or psychological research using primates, where the deliberations could influence future cost/benefit assessments. Meetings could also discuss where effort to develop new methods on the Three Rs should be focused. Such meetings would provide a forum in which the serious scientific work carried out by some animal rights and animal welfare organisations could be discussed.
- 9.22 **We recommend that the Inspectorate should convene a regular forum to discuss specific scientific and welfare issues related to the use of animals in experiments.**

²¹² See the memorandum printed with their oral evidence, under “Freedom of Information”.

²¹³ The report of the conference is included at Appendix 4.

²¹⁴ The most recent of these, “The Use of Non-Human Primates in Research and Testing”, is available at: www.boyd-group.demon.co.uk

Product labelling

- 9.23 Only a few witnesses brought up the issue of product labelling.²¹⁵ There was little enthusiasm for using labelling to inform the public better, even if appropriate labelling could be agreed.
- 9.24 We note that the labelling of pharmaceuticals is governed by EU legislation, and would probably require more effort to change than is warranted by the debatable benefits which would result.²¹⁶ It is also unlikely that a form of words would ever be agreed which would not create more confusion than it dispelled.
- 9.25 With regard to the labelling of other products, there was again very little enthusiasm for changing any of the regulations. We note that the labelling of some cosmetics products is not always clear, as many of the individual ingredients will have been tested on animals at some stage, even if the finished cosmetic product has not been so tested. New EU regulations are in any case likely to supersede any recommendation we might make.²¹⁷ We did not pursue this issue further.

*Statistics of Scientific Procedures on Living Animals, Great Britain*²¹⁸

- 9.26 The statistics published by the Home Office contain a great deal of information, but seem to be prepared for statisticians, rather than for the general reader. They are consequently difficult to interpret.
- 9.27 We recognise that, in recent years, the Home Office has provided increasingly comprehensive introductory notes. These go some way towards summarising key points for the lay reader and certainly represent an improvement in the provision of information to the public.
- 9.28 In oral evidence, the Home Office and Inspectorate acknowledged that the presentation of the *Statistics* needed to be improved, and said that they were actively addressing the problem. They also noted, however, that an invitation contained in the 2000 *Statistics* for users to suggest improvements has so far failed to elicit a single response, although this may be a reflection on their poor public outreach (Q. 1938).
- 9.29 **We recommend that a formal consultation on the *Statistics* is carried out with a view to making them easier to interpret.**
- 9.30 The problem, however, goes beyond presentation. We agree with the RSPCA, who stated: “The information contained within the statistics appears to be detailed but is actually of limited use...one cannot ascertain what was actually done to animals (i.e. which procedures), how much suffering was caused and for what purpose.”²¹⁹

Currently, the only information on levels of suffering contained in the annual *Statistics* is contained in Annex B. This information is limited to giving the number of licences in force in each severity band on a particular date.

Table: Project licences in force on 31/12/2000
(Extract from the *Statistics: Great Britain 2000*, p. 96)

<i>Severity Band</i>	<i>Number</i>	<i>%</i>
Mild	1,330	39.37
Moderate	1,842	54.53
Substantial	68	2.01
Unclassified	138	4.09
Total	3,378	100

²¹⁵ Lord Winston (Q. 1856) and Seriously Ill for Medical Research consider that all medicines should be labelled “tested on animals” (p. 320).

²¹⁶ Department of Health (p. 175).

²¹⁷ The European Parliament recently approved an amendment to the Cosmetics Directive which would ban the testing of cosmetics on animals in Europe by 2004.

²¹⁸ As mentioned above, these statistics, published by the Home Office, apply only to Great Britain. Statistics for Northern Ireland are collected and published along very similar lines by the Department of Health, Social Services and Public Safety.

²¹⁹ RSPCA (pp. 297–98).

- 9.31 Each project licence can encompass from one to several hundred animals. The number of licences in each severity band do not therefore give any reliable information as to the actual number of animals which may suffer. There is also no information about the purposes for which the licences are granted at the various severity bands.
- 9.32 We agree with the Reverend Professor Michael Banner, the chairman of the APC, who when asked about information on assessment of pain and suffering in the *Statistics*, said:
“It is astonishing to me...to find that rather crucial bit of information buried in an appendix to regular statistics. I think there would be considerable merit if it could be done in ensuring that the degrees of pain and the number of animals involved in each of those categories is brought more to the fore.” (Q. 51)
- 9.33 The Chief Inspector said that the only way meaningful information could be gathered would be retrospectively (Q. 89). While he was in principle in favour of providing statistics on suffering, in practice, he was concerned that no accurate and cost-effective system could be devised, and that any statistics produced were likely to be misleading (Qs 1944–47). This is the philosophy of despair.
- 9.34 From the licences we have seen, we consider that the current system of assessing pain and suffering is already highly misleading. Licences are allocated into one of three severity bands, based on the experience of suffering of the “average” animal. We consider that if a procedure involves 20% of animals in mild severity, 70% in moderate severity and 10% in substantial severity, then this should be recorded.
- 9.35 The Inspectorate itself could not possibly assess the suffering experienced by the 2.6 million individual animals used each year in Great Britain. Any assessment of suffering would therefore have to be made by local staff (for example, the Named Veterinary Surgeon or Named Animal Care and Welfare Officer) and audited by the Inspectorate. This system would thus be largely based on trust.
- 9.36 The availability of information as to levels of suffering and purpose of each project is crucial to the public understanding of animal procedures. Such information would enable the public to make informed judgements about the justification of animal research. Moreover, information would highlight where there was greatest suffering, and hence where the need to develop replacements, reductions and refinements was greatest.
- 9.37 Scoring systems are already in use for some animals in some establishments.²²⁰ We recognise that no system will be perfect, but consider that the current situation, where little real information on suffering is made available, cannot be allowed to continue.
- 9.38 **We recommend that serious efforts should be made to provide better statistics on animal suffering. The Home Office Inspectorate should develop or approve a “scoring system” for animal suffering which could be operated by Named Animal Care and Welfare Officers and Named Veterinary Surgeons and used to provide data for the *Statistics*.**
- 9.39 We acknowledge that the prospect of assessing every animal in every procedure is a daunting one, both in terms of expense and bureaucracy. We therefore suggest that a pilot system is developed to monitor the actual suffering experienced by all animals covered by a range of project licences in each of the three severity bands.

²²⁰ Professor Combes, FRAME (Q. 491).

APPENDIX 1

Membership and Declarations of Interest

The members of the Select Committee which conducted this Inquiry were:

Lord Brennan
 Baroness Eccles of Moulton
 Lord Hunt of Chesterton
 Lord Lucas
 Baroness Nicol
 Earl of Onslow
 Baroness Richardson of Calow
 Lord Soulsby of Swaffham Prior
 Lord Smith of Clifton (Chairman)
 Lord Taverne
 Baroness Warnock

The Committee appointed as its Specialist Adviser:

The Reverend Professor Michael J. Reiss, Professor of Science Education, Institute of Education, University of London

The Committee received additional specialist assistance from:

Dr Jane A. Smith, freelance researcher, including Secretariat, Boyd Group

Declarations of interest*Baroness Eccles of Moulton*

Vice-Chairman, Durham University Council 1985–
 Chairman, Ealing District Health Authority 1988–93
 Chairman, Ealing, Hammersmith and Hounslow Health Authority 1993–2000
 Member, British Heart Foundation Council 1989–99
 Member, Unrelated Live Transplant Regulatory Authority 1990–99

Lord Hunt of Chesterton

Chairman and Director, Cambridge Environmental Research Consultants 1987–
 Fellow, Royal Society 1989–
 Council Member, Royal Society 1999
 Professor, Climate Modelling, University College London 1999–

Baroness Nicol

Council Member, Royal Society for the Protection of Birds 1989–94
 Vice-President, RSPB

Lord Smith of Clifton

Vice-Chancellor, University of Ulster 1991–99
 Honorary Professor, University of Ulster 1991–

Lord Soulsby of Swaffham Prior

President, Royal College of Veterinary Surgeons 1984
 Chairman, Animal Research Grants Board 1986–89
 Member, Home Office Animal Procedures Committee 1987–95
 Chairman, Ethics Committee, British Veterinary Association 1994–
 President, Pet Advisory Committee 1996–
 President, Royal Society of Medicine 1998–2000
 Chairman, Companion Animal Welfare Council 1998–
 Patron, Fund for the Replacement of Animals in Medical Experiments
 Chairman, Ethical Revue Panel, Thoroughbred Breeders Association Equine Fertility Unit
 Foundation Fellow, Academy of Medical Sciences
 Fellow, Institute of Biology
 Previously Chairman, Veterinary Advisory Committee, Horserace Betting Levy Board
 Joint Hon. Secretary, Associate Parliamentary Group for Animal Welfare

Lord Taverne

Chairman, Sense about Science

Baroness Warnock

Chairman, Home Office Committee on Animal Procedures, 1980–85
 Member, Ethical Advisory Committee, Pharmagene

APPENDIX 2

Terms of Reference

The Committee's terms of reference were:

“To consider and report on issues respecting animals in scientific procedures in the United Kingdom, including—

- (1) the working of the Animals (Scientific Procedures) Act 1986;
- (2) the effectiveness of and justification for animal procedures, particularly in:
 - (i) medicine
 - (ii) education
 - (iii) defence
 - (iv) product testing; and
- (3) the development and use of alternatives to animal procedures;
 - and in all the foregoing considerations to pay regard to:
 - public attitudes, availability of information, labelling and consumer issues;
 - development in biotechnology, and the likely future demand for animal procedures;
 - the effect of any changes on the economy and the science base;
 - EU and international law and practice.”

APPENDIX 3

Committee Visits

This Appendix contains details of the visits undertaken by the Committee during the course of its Inquiry. The Committee is extremely grateful to all those who took considerable time and trouble to host visits and assist the Committee in its work.

2001

19 July	Huntingdon Life Sciences, U.K.
24th July	Cambridge Institute for Medical Research, Wellcome Trust/MRC buildings, Addenbrooke's Hospital, Cambridge University
6th December	GlaxoSmithKline, Harlow
17th – 18th December	Scottish Agricultural College; the Moredun Research Institute, and the Roslyn Institute

2002

25th February – 1st March	United States of America
16th – 17th May	France

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Huntingdon Life Sciences, 19th July 2001*Visiting Party*

Lord Smith of Clifton; Lord Brennan; Baroness Eccles of Moulton; Lord Lucas; Earl of Onslow; Baroness Richardson of Calow; Lord Soulsby of Swaffham Prior; Baroness Warnock; Professor Michael Reiss (*Specialist Adviser*) and the Clerk.

Programme of visit

The Committee was given a presentation of the work of contract research organisations, and of Huntingdon Life Sciences in particular. There was discussion of the regulatory requirements in the UK.

The Committee also received a presentation on the use and development of *in vitro* alternatives. The great majority of toxicological tests were required by regulators: where non-animal tests were validated they were always used, but money was needed to carry out the validation of new non-animal tests.

The Committee was given an extensive tour of the animal facilities.

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Cambridge Institute for Medical Research, Wellcome Trust/MRC buildings, Addenbrooke's Hospital, Cambridge University, 24th July, 2001*Visiting Party*

Lord Smith of Clifton; Baroness Eccles of Moulton; Lord Lucas; Baroness Nicol; Baroness Richardson of Calow; Lord Soulsby of Swaffham Prior; Professor Michael Reiss (*Specialist Adviser*); and the Clerk.

The Committee was given a presentation by the Certificate Holder on the use of animals in Cambridge University. It was said that the Act generally worked well, except that amendments to project licences took too long to process. This was important, as 68% of Cambridge University Home Office applications were for amendments to project licences. It was also said that institutional fast-track arrangements for Ethical Review Processes did not reduce the average time taken by the Home Office to approve amendments.

The Committee was given four further presentations on the purposes for which animal research was done.

“Mice and Men”, which illustrated the similarity of mice to humans for research purposes, and noted in particular the usefulness of GM mice.

“Cardiovascular Disease” which illustrated the usefulness of mice for research into atherosclerosis, and emphasised that animal testing and testing in humans continued in tandem and informed research in the other species.

“Behavioural Neuroscience from Animal to Human Research” which discussed research linking brain mechanisms to behaviour.

“Translation of Laboratory Research into Patient Care” which gave examples of animal research leading to treatments for human conditions. It also noted that patients could be put at risk when research on animals was not done effectively.

The Committee was given a tour of the animal facilities, including the transgenic mouse facility and the surgical suite.

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GlaxoSmithKline, Harlow, 6th December, 2001

Visiting party

Lord Smith of Clifton; Baroness Eccles of Moulton; Earl of Onslow; Lord Taverne; Baroness Warnock; and the Clerk.

Programme of visit

The Committee was welcomed by Tachi Yamada M.D., Chairman of Research and Development.

Dr Yamada gave a presentation on the process of drug discovery.

Dr Yamada and other GSK representatives also covered: an overview of the regulatory burden in the UK; comparison of UK, the US and other countries for R&D; and the recent developments concerning animal rights extremism in the UK.

Some of the issues Dr Yamada covered in his remarks included: (1) the true cost of developing a new medicine (approximately £500 million); (2) in vitro screening and in vivo imaging technology which would provide better focused R&D; (3) the importance of “blue skies” research, as useful outcomes could not always be predicted (GSK spent around £300 million each year on “blue skies” research out of a total research budget of £2.5 billion); and (4) the overall climate for research in the UK. Dr Yamada praised the excellent quality of universities and scientists although the burden of over regulation and the animal rights movement pose a long-term threat to the UK scientific base. Dr Yamada welcomed the Government’s recent statements in support of animal experiments, and the fact that he considered the media to have become more balanced in its coverage of the issue.

The Committee was given a further presentation on regulation in the UK. Companies in the US had a competitive advantage, as bureaucracy was less and they could get projects up and running faster than companies in the UK. The problem with bureaucracy in the UK was not with the Inspectors themselves, but with a lack of IT and administrative support. GSK received accreditation from AAALAC, which they commended as it was not prescriptive but considered welfare outcomes.

The Committee was given a tour of the animal facilities.

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Scotland, 18th–19th December, 2001*Visiting Party*

Lord Smith of Clifton; Earl of Onslow; Baroness Warnock; Professor Michael Reiss (*Specialist Adviser*); and the Clerk. The party was augmented on the 19th December by Baroness Eccles of Moulton and Lord Hunt of Chesterton.

Tuesday 18th December

Scottish Agricultural College

The Committee was given a presentation on the work of the Scottish Agricultural College: about half their work was on animal and veterinary science, the rest was on farming systems, animal health and animal welfare.

In general, the scientific community was happy with the 1986 Act. The Act worked well as it obliged scientists to justify what they were doing. It was observed that it was not always clear which procedures fell within the Act. A study might not require a licence if carried out as part of normal animal husbandry, but the same study might require a licence if carried out in a research institute. All surgical interventions, including the taking of blood samples, required a licence. Accommodation for experimental animals was of a higher standard, and hence more expensive, than accommodation for farm animals.

It was argued that lay members on the ERP from within the institution had a better understanding of the organisation, and were often better placed to ask good questions than external lay members.

The Committee visited the SAC Howgate Welfare Centre and discussed behavioural studies on pigs. The Committee met licence-holders and Named Animal Care and Welfare Officers at the site, and saw the animal accommodation.

The Roslin Institute

The Committee was given a tour of the Roslin Institute. This included an explanation of how sheep were genetically modified, and the purposes for which this was done: sheep could be bred so that their milk contained alpha-1-antitrypsin, used in the treatment of cystic fibrosis, which would otherwise have to be extracted at great cost and difficulty from human blood. The Committee met Dolly, the first cloned sheep.

It was said that the Act worked well except for an overemphasis on technical breaches of regulations which had no adverse effect on animal welfare.

Wednesday 19th December

Moredun Research Institute

The Committee was given a presentation on the work of the Institute. The Committee was given a tour of the facility for large animals, and of the High Security Unit for research into ruminant infectious diseases. It was again said that accommodation standards for experimental animals differed from standards required for farm animals.

The Institute hosted a round table discussion involving Senior Project Licence holders, Certificate holders, and Named Veterinary Surgeons from the Scottish Agricultural College and the Moredun and Roslin Institutes.

It was said that the Act was necessary, and mostly good, but bureaucratically cumbersome. There was a problem recruiting technicians, particularly for working with farm animals as it was such a specialised field. What the Act covered was not always clear, and the views of Inspectors varied: some said that a particular nutritional study fell within the Act; another that it did not. Changes in protocols and accommodation were sometimes demanded, though they had no beneficial effect on animal welfare. To breed GM animals, four different committees had to be satisfied; the statistics on numbers of GM animals used were highly misleading, as many animals were never actually used in experiments, but were only used for breeding. The Statistics were also misleading, as although the total number of animals had increased, there had been great progress in developing refinements.

USA 24th February – 1st March 2002

Introduction

The Select Committee visited the United States of America between Sunday 24th February and Friday 1st March.

The purpose of the visit was to examine how animal experiments are licensed, monitored, and carried out in the USA, fulfilling the Committee's terms of reference which enjoin them to pay regard to 'EU and international law and practice.'

Visiting Party

Lord Smith of Clifton; Baroness Eccles of Moulton; Lord Hunt of Chesterton; Earl of Onslow; Lord Soulsby of Swaffham Prior; Baroness Warnock; Professor Michael Reiss (*Specialist Adviser*) and the Clerk.

The visit was arranged with the assistance of Dr Julie Moses from the British Embassy, Washington, who accompanied the Committee throughout its visit. Further assistance was given by Christopher Pook, British Embassy, Washington.

Principal points arising from the visit to the USA

Regulatory Oversight

There are three bodies which oversee the welfare of research animals. The United States Department of Agriculture (USDA), the Department of Health and Human Services (DHHS), and the voluntary accreditation body, AAALAC (the Association for the Assessment and Accreditation of Laboratory Animal Care).

- (i) The USDA covers all warm-blooded animals except rats, mice and birds. They are the only one of the three bodies to carry out unannounced inspections. There are 96 USDA Inspectors (in the Animals and Plant Health Inspection Service (APHIS)) to monitor c. 8,800 institutions. Each institution is visited every 6 months.
- (ii) The DHHS enforces regulations against all bodies in receipt of public funds. All vertebrates (including rats, mice and birds) are covered. The system was described as 'enforced self-regulation': institutions have to deposit an 'Animal Welfare Assurance' with OLAW (the Office for Laboratory Animal Welfare), but OLAW only carries out inspections where they have specific reason to believe that standards have been compromised.
- (iii) AAALAC is a private organisation which accredits animal research organisations. Accreditation is voluntary. Standards are high and cover all vertebrates. AAALAC visits laboratories, with advance warning, once every three years. Most large institutions, both public and private, obtain AAALAC accreditation to demonstrate publicly their commitment to high scientific standards and animal welfare.

The system of oversight is highly complex. The regulatory authorities emphasised that the various systems all worked together, but other witnesses said that there is duplication on the one hand, and omission on the other. Some institutions might be inspected by three bodies, others by none.

The US system is new, and still evolving. The reluctance to include rats, mice and birds under the Animal Welfare Act is based on practical difficulties, rather than on philosophical objections.

The US system is not explicitly founded on any ethical basis. There is no formal cost/benefit analysis, although there is an assessment of pain. It is also largely based on trust.

Institutions which are privately funded, use only use rats, mice and birds and choose not to be AAALAC accredited, have no legal oversight at all. This means that a number of rats, mice, and birds receive no legal protection. Estimates for how many rats, mice and birds are not covered ranged between 5% and 30%. No statistics are gathered on this. Several witnesses the Committee met, including Dr Peter Singer (at Princeton), and Dr Alan Goldberg (of the Johns Hopkins Center for Alternatives to Animal Testing), emphasised that they considered the US system to be unsatisfactory, and the UK system with respect to rats, mice and birds to be much better.

AAALAC is expanding internationally and already monitors some breeding centres used by UK institutions.

IACUCs (Institutional Animal Care & Use Committees)

IACUCs are responsible for approving research protocols. They are required by law to contain a veterinarian and a lay member who has no affiliation with the institution.

IACUCs are based within the local institution; they can be extremely flexible and help to minimise bureaucracy. At least one person the Committee met expressed incredulity that all UK research protocols should have to go to a central body. The converse of this, however, is that standards vary between institutions — research forbidden by one IACUC might be approved by another.

The presence of a true lay member 'to represent the interests of the community' is beneficial, but lay members are not recruited openly. There is no statute of limitations — lay members can serve on Committees indefinitely.

Only one lay member per IACUC is required. The Committee was told that one IACUC had 24 members, therefore it could be difficult for the lay member to have much influence. While there could be a case for insisting on more than one lay member in large IACUCs, the difficulty in finding good lay members was mentioned a number of times.

The UK has an 'Ethical Review Process', while the US has an 'Animal Care and Use' committee. It was noted that Huntingdon Life Sciences was the only institution the Committee met in the US which incorporated ethics into its mission statement.

Development of Alternatives

The following points derive principally from the meeting with Dr Alan Goldberg, the Director of the Center for Alternatives to Animal Testing (CAAT) situated at Johns Hopkins University, and from the meeting with Dr Paul Silber of In Vitro Technologies, a company specialising in the development of research using animal and human cells instead of whole animals.

The development of alternatives should be a business opportunity, not an obligation. The UK should establish itself in this field early on for economic reasons as well as for animal welfare ones. The US has recently increased ten-fold the federal funds available for 'bioinformatics' (including mathematical and computer modelling).

The word "alternatives" is misleading, as it implies only replacement methodologies. Refinement and reduction should not be ignored.

There has been real progress in developing alternatives in recent years. However, relying on serendipity to develop alternatives is not enough. The scientific community is often conservative and reluctant to embrace new methods: a centre for excellence might help to overcome this resistance.

CAAT is a very small institution: it does not develop alternatives so much as promote them, through funding and by providing information.

If *in vitro* testing is to expand, the supply of human tissues also needs to increase.

Public Attitudes and Animal Rights

There is a growing trend towards animal rights in the US, encouraged by celebrity pressure groups (such as the Doris Day Animal League). The problem of illegal activism is not as severe as in the UK, but is more severe than the Committee had first thought.

As in the UK 10 years ago, scientists are reluctant to make the case for animal use. This was illustrated by the fact that the Committee did not visit any pharmaceutical company in the US: a number of pharmaceutical companies were approached but turned down a request to visit.

There is no publicity about the use of animals in scientific developments – when a new drug is announced, scientists do not habitually refer to the animal work which was required to develop it.

Science education no longer involves dissection; there might be opportunities to use *in vitro* experiments involving animal cells in schools.

Freedom of Information

Lack of information is a major cause for concern for animal rights and animal welfare organisations. Scientists should be encouraged to be braver and release more information. Releasing all information

might be just as effective as withholding it, as industry and science would present a broad and united front to activists.

Conversely, in the US, scientists are lobbying the USDA to publish less information because activists are using 'triangulation' — cross-referring several pieces of anonymised, publicly available information — to work out the names and home addresses of researchers.

The potential for scaremongering is greatly increased if pieces of technical information are taken out of context (every substance is toxic if taken at sufficient dose).

In the US, companies have managed to obtain strict injunctions against activists which have effectively curtailed their activity. Similarly strict injunctions would not currently be granted in the UK.

Record of Meetings

Monday 25 February

Beltsville Agricultural Research Center (BARC)

Meeting with Dr Phyllis Johnson, Director of BARC

The operation of regulation of animal experiments in the USA was discussed. In particular, it was noted that there were different guidelines for the use of livestock as opposed to laboratory animals. Exhaustive details of protocols had to be submitted to the IACUC for experiments on farm animals, whereas no protocols had to be submitted for procedures carried out for animal husbandry.

Meeting with Dr Tom Saxton, Director, and David Granstrom, Associate Director, Animal & Natural Resources Institute, BARC

The research work undertaken at BARC was discussed. It was noted that 85% of funding came from federal sources, the remainder from individual grants or industry partnerships. All research was eventually published. BARC was not inspected by USDA Inspectors as it was part of the USDA. It was estimated that 90% of rats, mice and birds were covered by AAALAC (see below); objections to subjecting all rats, mice and birds to USDA inspection were based on practical difficulties. It was noted that the US had an Animal Welfare Information Centre, which gave advice on alternatives to animal experiments.

The Committee was given a bus tour of BARC.

Institute for Laboratory Animal Research (ILAR), National Academy of Sciences

Meeting with Dr Joanne Zurlo, Director, and Dr Ralph B Dell, Associate Director.

Institutions in receipt of federal funds are required to adhere to the standards of animal care laid out in the Guide for the Care and Use of Laboratory Animals produced by ILAR. They are also inspected by APHIS (see below).

It was said that animal testing was absolutely necessary for developing pharmaceuticals, but that good animal care was part of the conduct of good science. It was important to consider the overall welfare of animals, rather than try to specify details such as cage sizes. Pharmaceutical companies were putting money into alternatives. Research would follow money.

[Some members of the Committee had the opportunity to discuss matters further with Dr Dell when he visited the UK: see the minutes of that meeting in the volume of Oral Evidence.]

AAALAC: Association for Assessment and Accreditation of Laboratory Animal Care

Meeting with Dr John Miller, Director, and Dr Catherine Bayne Associate Director

The work of AAALAC and its relationship to the USDA and the Department of Health and Social Services was discussed. It was said that 90% of all animals were covered by regulation. All major producers of rodents, and all major drug companies were AAALAC accredited. Reports of inspections

by the Office of Laboratory Animal Welfare (which inspected federally funded institutions) were made public, but inspection reports carried out by AAALAC remained confidential.

It was noted that cage sizes in the US and Europe were based on experience rather than on evidence-based science — the American College for Laboratory Medicine was starting to give grants for research into accommodation requirements for different species, and even different strains.

Dinner with representatives of animal welfare organisations

The Committee entertained to dinner representatives from: the Doris Day Animal League; the Humane Society of the US; the Animal Welfare Institute; the NIEHS (National Institute of Environmental Health Sciences); and researchers from the US Senate.

Tuesday 26 February

Animals and Plant Health Inspection Service (APHIS) USDA, & Office of Laboratory Animal Welfare (OLAW), National Institutes of Health

*Meeting with Dr Chester Gibson and Richard Watkins (APHIS)
Dr Carol Wigglesworth, and Dr Stephen Potkay (OLAW)
Dr John Miller (AAALAC) was also present*

A presentation was given by OLAW. The system in the US was described as "enforced self-regulation" - institutions had to deposit an "Animal Welfare Assurance" with OLAW. There was considerable local autonomy, but variation between local IACUCs. Each IACUC had to have one lay member. The percentage of experimental animals in the US monitored by OLAW was not known: estimates were 50% to 90%.

A presentation was given by APHIS. APHIS had 96 Inspectors and an annual budget of \$12.5 million to monitor around 8,800 facilities, including 1265 registered research facilities, over 4,500 dealers and over 2,500 exhibitors (zoos and circuses). Inspectors made unannounced visits. Some states made the protocols of research publicly available.

All warm-blooded animals were covered by the Animal Welfare Act (fish and invertebrates were not covered, and rats, mice and birds were not actually inspected). Animals used in agricultural research for the betterment of the animal species were exempt from the Animal Welfare Act. Animals in defence research were not inspected by APHIS/USDA, but the Department of Defense stated that all animal defence research took place in AAALAC accredited institutions.

Lunch with representatives of industry and animal research

The Committee entertained to lunch representatives from: NABR (National Association for Biomedical Research); Americans for Medical Progress; PhRMA (Pharmaceutical Research and Manufacturers of America); BIO (Biotechnology Industry Organisation); and FASEB (Federation of American Societies for Experimental Biology).

National Institutes of Health (NIH)

*Meeting with Dr Michael Gottesman, NIH Deputy Director for Intramural Research
Dr Richard Wyatt, Executive Director, Office of Intramural Research
Dr James Taylor, Director, NIH Office of Animal Care & Use*

The work of the NIH was discussed. OLAW was part of NIH, but also monitored the NIH research. NIH used around 700,000 rodents each year. NIH operated web-based training courses: training was compulsory, and a refresher course was required every 3 years.

Potential lay members for IACUCs were usually recommended by word of mouth, and their term of office was not time-limited. IACUCs often rejected protocols.

Animal use had reduced, but some animal work was still necessary: a reduction in animal tests had led to compounds being tested in humans too early — with fatal consequences. ICCVAM (the Interagency Coordinating Committee on the Validation of Alternative Methods) examined the methodology of toxicology tests, but this would have little impact on basic research. It was also said that it was necessary for surgeons to perfect their technical skills by using animals.

NIH protocols were made public after they had been approved. There was considerable effort in the US to take the "message of science" to the public: research led to improved quality of life.

The Committee was given a tour of the animal houses and surgery facility.

Meeting with Dr Yvonne Maddox, Acting Deputy Director, Intramural Research

Differences in public attitudes to animals in the US and the UK were discussed, and how these might relate to the greater availability of information in the US.

Wednesday 27 February

Johns Hopkins University, Baltimore

Meeting with *Dr Theodore Poehler, Vice Provost for Research*
Dr Nancy Ator, Chair, University Animal Care & Use Committee and
Professor, Department of Psychiatry – Behavioral Biology, School of Medicine
Dr Janice Clements, Vice Dean for Faculty Affairs, Professor & Acting Chair,
Department of Comparative Medicine, School of Medicine
Dr Alan Goldberg, Director, Center for Alternative Testing, Professor,
Department of Environmental Testing, Bloomberg School of Public Health

The animal research and the IACUC system at Johns Hopkins University was discussed. Johns Hopkins submitted 500 new animal research protocols each year, and 1,200 were in force at any one time. Johns Hopkins received AAALAC accreditation.

The Johns Hopkins IACUC reviewed 50 protocols each month. Most were slightly amended or deferred. None were absolutely prohibited. The time taken to approve protocols was, on average, one month, though some could take much longer, especially if they needed to be rewritten.

Genetic engineering technologies would lead to an increase in the use of animals. The university currently had 50,000 mice; 10 years ago there had been only 5,000. The university had NIH funding for many new projects, and a new animal facility was being built to house 140,000 mice.

Dr Goldberg discussed the Center for Alternatives to Animal Testing (CAAT), which was founded 20 years ago. It had a role to educate the public, educate scientists about alternatives, and provide funding for small projects on alternatives. He said that he still considered himself to be an animal scientist.

[Dr Goldberg was subsequently invited to present formal, oral evidence to the Committee: see the transcript of the meeting on 23 April printed in the volume of Oral Evidence]

The Committee was given a tour of the animal facilities, and met several research scientists and technicians who worked with animals.

In Vitro Technologies, Baltimore

Meeting with Dr Paul Silber, CEO, In Vitro Technologies

Dr Silber had been a toxicologist working with animals. He had moved into in vitro studies, not for ethical reasons, but because it was better science. He still used animal tissue. He also used human tissue, and discussed the logistical difficulties in obtaining it. He said that in the US there was not a particular concern with using human tissue, but there were cultural difficulties with using human tissue in other societies, such as Japan.

The number of animals used to develop each drug were decreasing, as pharmaceutical companies used more *in vitro* research to identify toxic compounds early, before they were tested on animals. This was driven by cost: a chronic bioassay (using 200 rats over 2 years) could cost between one and one and a half million dollars. An in vitro study, which might identify toxicity at an earlier stage, cost between \$10,000-\$50,000. Drug development costs increased exponentially once animal research was required.

Animals may be used less, but there would still be a need for animal testing in toxicology for at least another 20 years.

Thursday 28 February

Huntingdon Life Sciences (HLS), New Jersey

The Committee was given a presentation about the type of work undertaken by HLS, and the US regulatory compliance framework. The campaign against HLS was also discussed, and the costs to the company which this had incurred. HLS had been successful in obtaining injunctions against activists.

The differences between the regulatory system in the US and the UK were discussed. There were also discussions about the public acceptance of animal work in the US and how this differed from the UK.

The Committee was given an extensive tour of the animal facilities.

Centre for Human Values, Princeton

Meeting with Professor Peter Singer, Professor of Bioethics

The moral and ethical arguments surrounding animal experimentation were discussed. Professor Singer said that human beings should not consider that they had a privileged moral status simply by virtue of belonging to a particular species. Privileged status should be based on identifiable characteristics, such as intelligence or self-awareness.

Professor Singer considered that 50% of science students in Princeton did not want to work with animals. The other 50% were prepared to use animals, but were concerned not to inflict pain.

Professor Singer said that the UK regulatory system for animal experiments was good as it allowed for ethical input in the cost/benefit analysis. By contrast, in the US, IACUCs were not asked to make ethical judgements. IACUCs were also greatly variable as there were no clear guidelines.

Friday 1 March

The Committee held a private meeting to discuss the visit.

* * * * *

France, 16th – 17th May, 2002

The Select Committee visited the Paris region in France between Thursday 16th and Friday 17th May.

The purpose of the visit was to examine how animal experiments are licensed, monitored, and carried out in France, fulfilling the Committee's terms of reference which enjoin them to pay regard to 'EU and international law and practice'.

In the course of receiving evidence, the Committee had already received evidence from the British Science Attaché in the Paris Embassy, and from the French Science Attachée in the London Embassy.

Visiting Party

Lord Smith of Clifton; Baroness Eccles of Moulton; Lord Lucas; Earl of Onslow; Lady Richardson of Calow; Professor Michael Reiss (*Specialist Adviser*) and the Clerk.

The visit was arranged with the assistance of Mr Andrew Holt, Foreign and Commonwealth Office, British Embassy, Paris, who accompanied the Committee throughout its visit.

Meeting with Dr Sylvain Posière, Chef du Service de Protection et Santé Animales, and Dr Daniel Faibra Djok, Veterinary Inspector, Direction des Services Vétérinaires de Paris*Licensing and inspection*

Dr Posière said that the Ministry of Agriculture made law which the decentralised Veterinary Service enforced. EU legislation required two licences. An Institutional Licence would be granted following an inspection of the premises and lasted for 5 years. A Personal Licence would be granted following the receipt of the relevant application form — there was no formal interview or visit by the Veterinary Service.

Under this system, protocols themselves were not approved. Each researcher was given responsibility to ensure the suitability of protocols. This made it difficult for the inspectorate to tell whether alternatives were seriously considered. Recently, however, non-compulsory ethics committees had begun to be introduced which did consider the 3Rs. Most recently of all, a National Commission on Animal Experiments had been set up which had the power to oversee protocols and monitor standards of training.

Inspections were usually pre-arranged, although unannounced visits were sometimes made. If laws were contravened, sanctions were available and usually consisted of fines. Dr Posière knew of no institution in the Paris region that had lost its licence, although this sanction was possible. He noted that the Veterinary Service had been trying to encourage numerous small animal houses to merge into fewer larger ones, to make them easier to monitor.

Personal Licence applicants had to possess scientific qualifications and also undergo 15 days of initial training. No further training was then required. The inspectors could ensure that laboratories kept up-to-date with new techniques, but did not oblige individual scientists to do so. Those involved in breeding animals were also required to undergo basic scientific training.

Inspectors attempted to enforce animal welfare standards (such as cage sizes) but were understaffed. This was partly because they had a responsibility for a whole range of animal welfare issues.

The Paris area was the largest animal research area in France with 150 institutions and 1,500 personal licence holders. To monitor this activity there were only three part-time inspectors in the Paris area. This situation was better than in most other départements.

The Chairman suggested that the principal difference between France and the UK was that the UK validated each protocol, while France enforced training standards and then trusted the scientists.

Dr Posière agreed that the lack of inspectors meant that the French system was based on trust. Nonetheless, from 7 years experience in the veterinary service, he considered that fewer and fewer researchers now operated outside the regulations. Particularly in the large laboratories animal welfare standards were good.

Veterinary Services inspectors

Local inspectors were all trained to the same standards on the same courses but preserved their autonomy. Dr Posière said that he was employed by the Ministry of Agriculture, but that his colleagues were employed by the département. The posts were fairly well paid, were well respected, and provided interesting work. They were becoming increasingly sought after.

Expertise varied between départements depending on local need; some inspectors specialised in cattle farms. Not all inspectors were trained in laboratory animal science, and those that were had only taken the same 15 day course as potential personal licence holders.

Public opinion and animal activism

Dr Posière said that there were a few animal extremists with whom rational dialogue was not possible. About 50% of the population, however, were in some way concerned about the use of animals. Scientists were not so concerned for their safety as they were in the UK, which meant that they viewed animal rights campaigners as a necessary evil. Dialogue happened more easily and regularly and institutions were more ready to open their doors to campaigners.

Animal activists played an important role in maintaining standards. They often gave information to inspectors with whom they were on good terms.

Ethical Review Process

There had been some debate as to whether the Ministry of Agriculture should make ethical panels compulsory. No research had yet been done to establish the effect of ethical review on animal welfare. Most large companies had now set up ethical panels which usually incorporated an external lay member.

National institutions were also encouraging the adoption of ethical review. Scientists acknowledged the need to consider the 3Rs, and realised that ethical review could improve the quality of the science. Many international journals also required evidence of ethical review of animal experiments. Dr Posière hoped that ethical panels would play an increasing role in monitoring animal procedures.

Miscellany

Dr Posière said that:

Animal use would never disappear. There would be more use of rodents and GM animals, and fewer dogs, cats and primates. Statistical matters were the responsibility of the Ministry of Research;

Surgeons were permitted to practise surgical techniques on animals;

Some cosmetics testing still occurred, though many tests were now banned by the EU;

Animals were not usually allowed to recover from severe procedures, although they were in certain circumstances — it was a question of the level of pain. Those animals which were allowed to recover could not be re-used in another experiment;

He did not know of any instances of UK scientists moving their research to France to take advantage of the different regulatory system;

Scientists visiting from abroad would have to undergo full training to acquire a licence;

Students did not need licences, but trained under the direction of a licensed Professor. Laboratory assistants similarly were required to undergo some general training, but did not need licences. The head of the research team would be held responsible for any breaches of standards;

Matters relating specifically to GM animals (such as regulations to prevent the release of animals into the general population) were regulated by the Ministry of the Environment.

Meeting with Mr Herman Koeter, Organisation for Economic Co-operation and Development.

Held in the British Embassy, Paris

Mr Herman Koeter is the Principal Administrator in the Environment Health and Safety Division of the Environment Directorate of the OECD. The OECD produces test guidelines for assessing the toxicity of chemical compounds. As the OECD is a consensus organisation, these guidelines cannot be implemented until accepted by all member states.

The OECD is not responsible for the harmonisation of tests relating to new medicinal products. They are negotiated through the International Conference on Harmonisation (ICH).

Discussion

Role of the OECD

Mr Koeter said that his division of the OECD was primarily concerned with the regulatory assessment of new chemical compounds in order to protect human health and the environment.

International toxicology agreements did not insist on animal use, but insisted on safety standards. Animal experiments were just one aspect of any toxicological assessment. The OECD had begun to take account of the 3Rs, but alternatives to animal experiments were not considered a priority. The development of in vitro tests had been driven by economic concerns and had been enabled by improvements in basic science — researchers had recently acquired a much better understanding of events at the cellular level.

The OECD had not yet sought to harmonise regulations governing animal procedures. Each country still had its own regulations and OECD guidelines were incorporated into national law.

OECD test guidelines were developed in the mid 1990s to harmonise the different requirements of national regulators, and hence reduce the amount of testing required to establish the safety of new compounds. Following harmonisation, one set of tests would be accepted by regulators in all OECD member states. This would obviously reduce the duplication of animal tests. In addition, statisticians had been involved in drawing up the guidelines to ensure that the optimal number of animals was used.

A few replacement tests had also been developed and were in the process of being adopted. The number of animals replaced by such alternatives was very few (one hundredth of 1% of the total), but those few had been involved in tests of the most substantial severity. Better welfare guidelines had also been developed.

Mr Koeter acknowledged that the consensual nature of the OECD was a difficulty in implementing alternatives. The greater difficulty, however, was the nature of toxicology.

The nature of toxicology

Toxicological assessments involved numerous different tests which fitted together like pieces in a jigsaw puzzle. Trying to devise an alternative to one particular test was like trying to replace one piece of the jigsaw puzzle: each alternative would need to be an exact replica of the test it replaced. This process was therefore difficult and saved few animals. What was needed was a new jigsaw, a whole new system of toxicological assessment.

Developing a whole new toxicological system however would be particularly difficult as so many different countries were involved. Austria and Sweden, for a combination of cultural and historical reasons, were opposed to the use of human tissue. Testing on humans would be ideal but would usually be unacceptable: there was also a danger that tests on humans would be carried out in unregulated environments such as Africa and South America to the potentially severe detriment of the health of volunteers.

In order to develop such a new toxicological system, short-term thinking related to specific projects was not enough. Alternatives research needed a long-term perspective which would require government funding. Currently, around €40-50 million was spent on alternatives each year in Germany and the Netherlands. This contrasted with the Home Office's current alternatives budget of £280,000.

Moreover, Mr Koeter said that the alternatives centre at Johns Hopkins in the USA had been criticised for being too closely linked to and funded by industry. Alternatives Centres needed to be funded by government as well as industry.

Mr Koeter argued that a Government funded UK alternatives centre would be “a big step forward”.

A Centre for Alternatives

Mr Koeter considered that the science community was starting to take alternatives more seriously, and scientists specialising in alternatives were now accepted and respected. This was illustrated by the forthcoming ‘4th World Conference on Animal Welfare’ which had expanded enormously since its

inception 12 years ago. Nonetheless, there was still an important role for integrated alternatives centres.

Independent alternatives centres had no future. ECVAM's research laboratories were now practically empty, although ECVAM still had a function in co-ordinating and promoting alternatives. Similarly, the 'stand alone' laboratories at FRAME had done some very good work, but had had little effect on the regulatory use of animals.

By contrast, the Johns Hopkins Centre for Alternatives to Animal Testing (CAAT) was integrated with animal research. The most successful centre was ZEBET, in Germany, which was embedded in traditional science and involved experts in numerous fields. Most of the alternatives claimed by ECVAM were actually developed at ZEBET.

Embedded centres for alternatives could also take account of local idiosyncrasies. For example, there was enthusiasm for alternatives in the UK, Germany, the Netherlands and Sweden. There was little enthusiasm in France, Spain, Portugal or Italy. Scientists in Spain, however, were sensitive to the welfare of fish — the result of local, cultural differences.

Successful centres were always integrated into traditional science. Conferences and seminars alone were not effective. Alternatives scientists must be kept up-to-date with developments in animal science and vice versa — this would lead to overall better science. Moreover, having the alternatives centre as part of an integrated animal and non-animal laboratory would lead to a greater acceptance of alternatives by animal scientists.

A nucleus of 'alternatives science', possibly consisting of just one scientist, needed to be situated within the principal life-sciences research centres. Obvious places to site such nuclei would be in the Medical Research Council research centres and in universities.

Environmental Enrichment

Mr Koeter indicated various difficulties with enriching the environment of laboratory animals. Woodchips, for example, could not be used as a nesting material as they contained too many chemicals which could interfere with toxicological tests. There could also be difficulties with allowing animals to express natural behaviour patterns too freely. Currently, domesticated laboratory rats liked to be picked up; undomesticated rats, however, would become so stressed if they were picked up that changes in their physiology would interfere with the experiment.

Nonetheless, some forms of environmental enrichment, such as substituting solid-bottomed cages for wire-bottomed ones, could easily be investigated. As yet, however, no-one had suggested to the OECD that the necessary research, to discover how solid-bottomed cages affected test results, should be carried out.

Validation of Animal Tests

Mr Koeter said that the issue of the effectiveness of animal tests had been extensively discussed at the OECD conference in Stockholm in March 2002. The validity of a test was composed of its relevance and its reliability.

In vitro tests could indicate whether a chemical had adverse effects, but could not explain why. He gave the example that, if a new chemical kills a plant, scientists would not immediately discard the chemical, as humans shared few mechanisms for toxicity with plants. Scientists would first try to understand the underlying mechanism in order to know whether the chemical would have a similar effect on humans.

Animals, however, shared many physiological characteristics with humans, and many of the mechanisms for toxicity were similar. Even so, a new chemical which caused an adverse reaction in animals would not be automatically discarded; scientists still needed to assess whether the underlying mechanisms of a particular adverse reaction were relevant to humans.

Experience and use was vital in assessing which animal species should be used to provide relevant data. In general, scientists used the rat, as more was known about the rat than about any other species, including humans. It was also known where different reactions between the rat and humans were likely to occur.

Mr Koeter was against a systematic, retrospective assessment of all animal tests. Many tests had proven themselves with use — teratogenicity tests, for example, had prevented any reoccurrence of

the thalidomide episode. A new validation of all animal tests would be impractical, expensive, and involve enormous numbers of animals in new experiments.

Good Laboratory Practice

Mr Koeter was not especially concerned that animal procedures would be carried out in countries with little regulation. For results of animal experiments to be acceptable to the OECD, laboratories needed to comply with Good Laboratory Practice (GLP). Laboratories needed to be accredited by an approved government authority. Results from animal tests in Brazil, for example, would be rejected as there was no government oversight of GLP.

Role of the ICH

The ICH (International Conference on Harmonisation) had been set up to harmonise the testing guidelines for the development of pharmaceuticals. The OECD was only responsible for issuing guidelines on chemicals.

Only the US, the EU and Japan were members of the ICH. The intention was that the ICH, comprising only three members, would operate more efficiently than the OECD. In practice, however, the same scientists in the same laboratories were used by both organisations to validate tests. Mr Koeter therefore considered that the ICH was not significantly more efficient.

The secretariat of the two bodies worked closely together to prevent any duplication of effort.

Visit to a pharmaceutical company

The Committee was given a short introduction to the pharmaceutical company.

It was emphasised that work on animals formed one part of the many processes involved in drug development. Similarly, work on genomics was just one research activity among many. Pharmaceutical companies all conducted considerable *in vitro* work.

Working under French Legislation

French law took account of EU Directive 86/609/EEC and required site licences and personal licences. It was argued that there was little significant difference in animal welfare between France and the UK. Good animal health was necessary for good science. The following issues were discussed.

Site licences

Site licences were, on average, 4 pages long (and numerous appendices depending on the size and activity of the site). They needed to state the maximum number of animals of each species which could be housed on the site, and they needed to justify the use of animals. Such justification, however, could be very general, “To prove the safety and efficacy of new drugs”. If no reply had been received from the local inspector 3 months after submitting the dossier, the site would be most probably approved with the official notification sent later. The local veterinary service inspected the site once each year, for one day. The authorities have to be informed of any major subsequent modifications to the site.

Personal licences

The licence holder was the scientist in charge of the project, and was held legally responsible for the welfare of the animals used. Personal licences, which included details of the proposed protocols (akin to the ‘Project Licence’ in the UK) were a maximum of 10 pages long. The holder of the licence must have a university level qualification and undergo 80 hours of training. (Animal technicians were also obliged to attend a 40 hour training course approved by the Ministry of Agriculture.)

To obtain a licence, the researcher had to submit a dossier stating what would be done and why. The researcher had also to state that there were no available alternatives. Since May 2001, the researcher had also to assess expected levels of pain. No single system of pain assessment had been universally adopted, although it was said that the Swiss Scale was both practical and informative.

Only a very general indication of the work of the researcher needed to be given. Individual protocols would be discussed in ethical review committees, but would not be specified on the licence. Personal licences were usually processed within a month, and often within 2 weeks. The authorities have to be informed of any significant modifications, but no active decision was usually taken by the Préfecture — the veterinary inspectors were simply notified.

GM animals

Under French and European legislation, GM animals solely used for breeding were not covered by animal experimentation legislation. The actual number of animals used in experiments was decreasing, as many experiments required either a few, targeted GM animals, or many more ordinary animals. Moreover, genetic modification had led to the use of more mice, but fewer dogs and rabbits.

It was further observed that in France, but not necessarily in the rest of Europe, animals killed to obtain tissues for *in vitro* work were also included in the numbers of experimental animals.

Alternatives

Research scientists were at the forefront of the development of alternatives — an example was the introduction of radio-telemetry which benefited both the animal and the researcher. By contrast, ECVAM, which only considered regulating testing, including toxicology, was said to have little effect on animal welfare but had been set up as a matter of good PR.

Public opinion: dogs and micropigs

The French public were much more tolerant of animal research than the public in the UK, and there was a much healthier relationship between scientists and animal welfare associations. European trade associations had been talking to the ABPI in the UK to try to learn from the experience of Huntingdon Life Sciences. European pharmaceutical companies were beginning to realise that they needed to be more transparent and more proactive in explaining what they did.

In France, however, there was a strong aversion to the use of dogs. Any proposed laboratory or breeding centre which could house more than 50 dogs was automatically subject to a public inquiry. There was thus strong pressure to reduce the use of dogs, but the usual alternative was to use primates, which many scientists considered unacceptable. Researchers had begun therefore to use micropigs: these had the additional advantage of being better scientific models for some types of cardiovascular research.

Ethical Review

Ethical review committees were not required by law, but were becoming increasingly common in France. Ethical review committees had begun in pharmaceutical companies around 15 years ago, and only now was a French National Committee being set up. All large and medium sized pharmaceutical companies in France now used ethical review. Committees usually consisted of scientists but also involved non-scientific members. These lay persons, however, were frequently employed by the pharmaceutical companies in non-scientific capacities.

The implementation of ethical review processes was driven by many factors. Ethical review could improve the science. Leading academic journals required evidence of ethical review before they would publish articles. Major investors, such as US pension funds, had started to require evidence of ethical review as part of their assessment of pharmaceutical companies. Researchers were becoming increasingly aware of the need for transparency and good ethical standards to maintain public confidence in animal research.

Visit to animal facilities

The Committee was given a tour of the animal holding facilities and laboratories, including explanations of various refinements in housing standards.

Visit to the Pharmacy Faculty, Université René Descartes, Paris V

The Committee was welcomed by Jean-Pierre Clot, Professor of Endocrinology, and Chantal Martin.

The Committee was given a tour of the animal holding facilities and saw rats, mice and rabbits. The Committee also viewed experimentation rooms and saw a procedure on a rat taking place.

The Dean and Vice President of the University, Professeur Dominique Durand, showed the Committee around the University.

APPENDIX 4

Conference Proceedings, 21 May 2002

Proceedings of the Conference held in the House of Lords, 21st May 2002

Opening Session

Chaired by the Chairman of the Select Committee, Lord Smith of Clifton.

Lord Smith welcomed the delegates and thanked them for attending.

He said that the conference was intended to provide the best possible information for the Committee. It was unlikely that consensus would be reached within the working groups, but it would nonetheless be useful for the Committee to be able to take a helicopter view of all shades of opinion before they began to draft their final report.

Five speakers were invited to give short presentations.

Dr James Anderson, Home Office Inspectorate

Dr Anderson said that the Animals (Scientific Procedures) Act 1986 was “enabling legislation” which was the UK implementation of Directive EC 86/609. The core of the Act was a principle — the cost/benefit analysis. This meant that the Act was perpetually applicable and constantly contemporary.

Over the 15 years of the operation of the Act there had been advances in animal facilities and accommodation and, principally, the establishment of a “culture of care”. An important feature of the Act is that all the key questions on scientific validity and alternatives were matters of judgement concerning the available information. Confidence in the Act came down to both scientists and anti-vivisection organisations having confidence in the Inspectorate.

Dr Anderson said that compulsory training modules had been introduced for personal licence holders (1994), project licence applicants (1995) and Named Veterinary Surgeons (1996). Training for NACWOs was in prospect. He also discussed the Ethical Review Process. This had had a beneficial effect on the consideration of animal welfare, although it also had the potential to become bureaucratic. The Inspectorate’s review gave examples of best practice to help ERPs operate more efficiently.

Dr Pete Clifton, British Psychological Society

Dr Clifton said that the 1986 Act was a great improvement over the previous legislation: accommodation standards had improved and more veterinarians and animal welfare experts were involved. He considered that the Act struck an excellent balance.

The cost/benefit analysis was hampered by the need for more research into animal behaviour to assess animal welfare better, and the fact that the benefits of “blue skies” research were intrinsically unpredictable. Replacement alternatives were often not possible, so emphasis should be placed on reduction and refinement.

Bureaucracy in obtaining licences meant that some experiments were simply not done in the UK. There had also been difficulties with permissions for visiting scientists. Finally, he said that the inclusion in the Statistics of GM animals used solely for breeding was misleading.

Dr Maggy Jennings, RSPCA

Dr Jennings said that the RSPCA had a goal to end all animal experiments, but worked in the short term to minimise animal suffering. Animals lives also had intrinsic worth and should not be wasted. The RSPCA had four specific concerns.

One, alternatives and toxicology. A fundamental change was required: instead of justifying animal use, thought needed to be given to how the need for animals could be removed. In vivo and in vitro testing should be integrated, rather than attempting to replace each individual animal test with a non-animal alternative. This shift in attitude required changes in tertiary science education.

Two, freedom of information. There was no information on how costs and benefits were determined by the Inspectorate, and the Statistics gave no account of animal suffering. Confidentiality hampered the development of alternatives and limited input into the regulatory process. It also prevented effective communication between Government bodies such as the APC, UKXIRA and the Home Office.

Three, regulation. The life experience of experimental animals should be taken into account as “cost”. The “acquisition of knowledge” was too broad a category for benefit, as it could justify almost anything.

Four, the ERP was the key to improving local implementation of the Act. There should be increased lay and animal welfare membership.

Dr David Smith, AstraZeneca

Dr Smith said that animal testing removed severely toxic compounds, identified likely adverse effects, and established the safe starting dose and dose response: “The right dose differentiates a poison from a remedy” (Paracelsus). Risk assessment was not absolute safety. Acceptable levels of risk were determined by society, which is increasing its demand for reassurance. Identifying low-incidence effects required many more animals.

He said that the easy gains in replacement alternatives had already been made. There had been limited progress with the use of whole organs. In particular the liver, where human toxicity was most frequently found, was not well understood. Emphasis should be placed on improving the “failure rate” of compounds at the molecular level before they were ever tested on animals. Regulatory “box-ticking” should be removed: he cited a joint industry/animal welfare initiative to dissuade the EU from any possible increase in group size. The numbers of animals used were not, however, as important as the welfare of the animals that were used. A holistic approach to the Three Rs was advocated.

Toxicologists had problems with: the supply of animals (the closing of breeding farms in the UK simply meant that more animals were transported from abroad); intimidation by Animal Rights groups in the UK, which affected the ability to recruit and retain staff and over-optimistic assessments of alternative technologies. Toxicologists were making efforts to engage with animal rights groups, but disliked change for change sake if clear animal welfare benefits were not forthcoming.

Michelle Thew, BUAV

Michelle Thew said that she shared Dr Smith’s conviction that there was a need for new medicines and a need for them to be as safe as possible. However, researchers would not experiment on humans without obtaining their consent, whatever the need. She considered, similarly, that the deliberate infliction of suffering on another animal, if not for its benefit, was immoral.

It was generally accepted that animals did indeed suffer, but over 60% of procedures were carried out without anaesthesia. The Act should operate with clear and transparent policy guidelines and reflect informed public opinion — currently it was operated by ex-animal researchers for animal researchers. She quoted Dr Mark Matfield from the Research Defence Society to the effect that security concerns were often over-stated. These concerns were nonetheless used to prevent transparency and accountability.

Duplicate testing was a problem, as the Home Office only encourages, but does not require, the sharing of data. Improvements such as the banning of research on Great Apes, or for cosmetics, were a start, but why was research not also banned on all primates, or for household products? Transparency was central for a proper debate. The BUAV could only advocate for animals if it had access to adequate information.

Working Groups

Report of Working Group 1: Centre(s) for Alternatives

Chair/Rapporteur: Dr Kenneth Boyd

1. It was generally agreed that targeted resources would help to promote and develop alternatives, though more in fundamental research than in toxicology.
2. Many of the best 'alternatives' had been developed by animal scientists in the course of their work, as they had the necessary expertise in a particular scientific field. Scientists must be encouraged to continue the development of alternatives.
3. This was not sufficient by itself, however, particularly as scientists tended to concentrate on reduction and refinement rather than on replacement. The MRC's Centre for Best Practice, for example, was focused on welfare rather than replacement.
4. There was already an enormous amount of information available, but it was on many different databases and there was little quality control. An overview of alternatives was also needed as even when individual replacement tests were developed, they often did not fit into the regulatory toxicology system.
5. Alternatives needed to be developed in context. Ring-fenced funding in other areas had not improved the quality of work done. Free-standing centres for alternatives would not be able to draw on the immensely wide range of necessary expertise. The onus would also then be taken off animal scientists to consider alternatives themselves.
6. There was very little enthusiasm for a free-standing 'wet lab', an independent monolithic research facility, or another validating body.
7. What was needed was a centre for strategic planning to co-ordinate funding, give alternatives science academic status, provide reliable high quality information, and encourage scientists themselves to develop alternatives.

Possible Structure of an Alternatives Centre

8. There was a remarkable degree of consensus in the group of the type of alternatives centre that would be most constructive. A hub and spokes model was proposed.
9. There should be a virtual centre at the hub. This would be a portal to relevant databases for alternatives (possibly including its own database), and provide a forum for sharing information (possibly including databases of 'negative results'). It could co-ordinate existing 'alternatives' funding by charities, industry and the Home Office.
10. The centre should be independent and funded by a wide range of interested parties, not just by industry. It should have close links to the Home Office and their internal databases. The Home Office could require project licence applicants to consult the centre as proof of their search for alternatives.
11. In addition, the centre should co-ordinate 'spokes'. These would consist of small research groups with different specialisations incorporated into existing research centres at Universities and medical schools. These small units would draw on the existing expertise in research centres, and act as drivers to incorporate alternatives research into the every day business of research science.
12. Some people were unhappy with the word 'alternatives'. It was suggested that the national hub should be called the 'Centre for the 3Rs'.

Other possible actions

13. Improving an awareness of and need for alternatives could also be achieved in other ways. One, three Rs terms should be added as search keywords to existing databases.
14. Two, Funding bodies should require applicants to demonstrate their search for alternatives and state what innovative techniques relating to the 3Rs their projects involve. Journals should require articles based on animal experimentation to incorporate a short note on the use or development of the 3Rs. These two steps would keep the issue of the 3Rs at the forefront of scientists minds.
15. Three, there was a need for better training in statistics and experimental design.

Plenary

16. In plenary, it was commented that “the world is full of partly developed databases”. The difficulties in maintaining even the virtual centre should not be underestimated. The centre would require a commitment to long-term funding.

17. Such a centre should act as a “champion” for alternatives, even if it did not conduct any actual research itself.

Report of Working Group 2: Toxicology

Chair/Rapporteur: Dr Barry Phillips (RSPCA)

How effective and reliable are in vivo toxicity tests?

1. In toxicology, in vivo toxicity tests (those using live animals) form only part of a complex process of risk assessment that takes account of other sources of information, including analysis of chemical structure and in vitro tests, and is also subject to expert interpretation and judgement. The purpose of toxicological risk assessment is to evaluate the likelihood of harmful effects on health from exposure to specific doses (or concentrations) of particular chemicals, and thus to inform the risk management process (actions such as prohibition of the use of a chemical, the specification of maximum recommended doses, or the provision of advice on safety precautions).

2. The effectiveness of in vivo toxicity tests per se is difficult to assess and cannot simply be deduced from the effectiveness of the entire risk assessment process. Thus, although there was agreement that human health and safety are, in the main, well protected by the current process, there was some disagreement as to whether this was due to the use of animal tests, or in spite of their use.

3. There is little hard scientific evidence upon which to base a judgement of the reliability of in vivo toxicity tests. This is due to the ethical constraints on testing chemicals in human subjects which preclude the confirmation in humans of adverse findings in animals. Only in the case of pharmaceutical substances, administered in doses judged to be safe, or after accidental exposure to chemicals, can the results of animal tests be checked against actual human experience.

4. Recently, the International Life Sciences Institute (ILSI) undertook a study of a series of pharmaceutical compounds that had shown toxicity in human clinical trials.²²¹ This study found that in 71% of cases, the effects seen in people were foreshadowed in the animal tests carried out prior to the clinical trials. When the results of tests on rodents were considered in isolation, only 43% of the human toxicities could have been predicted. Tests on dogs or primates were necessary to increase the prediction of toxicity to 71%. Of the 29% of effects not detected in animal tests, the majority were of a type that the animal tests were not designed to detect, or were intrinsically undetectable in this type of test e.g. headache and dizziness, and certain skin reactions.

5. It was agreed that the ILSI study has limitations, and that the general reliability of animal tests is very difficult to judge, as some animal tests may be more reliable than others. In broad terms, those tests designed to detect severe or rapidly developing effects, such as acute oral toxicity or irritancy, appear to be more predictive of human health effects than those attempting to detect more subtle, long-term effects. Deficiencies in the design of certain tests may also compromise their reliability. For example, the use of very high doses of chemicals in rodent cancer bioassays has given rise to a high incidence of findings that are unlikely to be of significance to human health.

6. It was noted that rare effects, in a small sub-group of the human population, are very difficult, if not impossible, to predict using laboratory tests or even in clinical trials.

7. It was pointed out that the validation requirements for non-animal tests is in marked contrast to the almost total lack of formal validation of animal test methods. Despite uncertainty about the reliability of animal tests, alternative methods are expected to give the same results. A figure of greater than 80% concordance with animal test results was quoted as a requirement for validation of an alternative method in the USA. A better method might actually be rejected because it gave correct results (correct prediction of human health effects) more often than the existing test.

²²¹ Olson, H. *et al.*, “Concordance of the toxicity of pharmaceuticals in humans and in animals”, *Regulatory Toxicology and Pharmacology*, vol. 32 (2000), 56–67.

8. It was concluded that the effectiveness and reliability of animal tests is unproven. It was recommended that the reliability and relevance of all existing animal tests should be reviewed as a matter of urgency.

9. It was suggested that the long-term solution to the problem was to work for a better understanding of the basis of disease and toxic effects, so that tests based on knowledge of the fundamental mechanisms involved could be designed rationally.

What is the scientific justification for (a) the use of a second, non-rodent species in chronic toxicity testing, and (b) the seemingly formulaic use of certain species (such as the beagle)?

10. The justification generally given for the use of a second, non-rodent, species is that rodent studies do not detect all toxic effects because of species differences. However, the scientific basis for the use of two species is questionable; tests could be conducted in any number of species and the relevance of the findings for man would be equally uncertain for all the species used. The use of two species is a compromise which provides some reassurance that important toxic effects have not been missed.

11. On a case-by-case basis, an appropriate test species can be chosen rationally if existing knowledge about specific chemicals indicates that one species is more likely than another to respond to a chemical in a similar way to man. In some cases, studies of human tissue *in vitro* can guide species choice. A number of organisations have published guidelines on the choice of appropriate test species. However, for practical reasons, the choice of species is very limited; a major consideration is experience in using a particular species, and the existence of a body of historical data on that species.

12. A study of the role of dog studies in pharmaceutical testing²²² found that for 115 pharmaceuticals, dog studies confirmed the findings from rat studies in 63% of cases but provided additional information in 37% of cases. New findings in the dog resulted in termination of drug development in 11% of all studies. Although the relevance of the findings for human safety could not be ascertained, the study recorded a 'consensus among toxicologists that the dog plays an essential role in the safety evaluation of pharmaceuticals'.

13. The formulaic use of two species in safety testing was not considered to be a scientifically justifiable practice, but rather an acknowledgement of the problem of species differences in extrapolating the results of animal tests to predict effects in humans.

14. The routine use of the dog in addition to the rat is a compromise which is largely dictated by practical considerations. Nevertheless, studies in dogs have provided important information.

Are new compounds ever tested on humans when they have already showed an adverse reaction in animals? If so, what is the purpose of the animal experiments?

15. All chemicals have some degree of toxicity. In the case of pharmaceuticals, compounds are intended to have beneficial effects on the human body; their pharmacological activity. If this activity is excessive, it becomes detrimental. The purpose of animal tests is to define the dosage which will yield a beneficial rather than a detrimental effect. Inevitably, the animal tests will be designed to include doses which have adverse effects.

16. In addition to the pharmacological effects of medicinal chemicals, they and all other chemicals have adverse side effects at certain doses. The purpose of animal tests is to define the nature of these effects and the likelihood of their occurrence at particular doses.

17. The process of risk assessment, based on animal test data, followed by risk management measures, is intended to ensure that human exposure is restricted to levels that do not result in an unacceptable risk of adverse effects. It is to be expected that chemicals will be used for various purposes despite the fact that adverse toxicological effects have been found in animals.

18. One specific example was discussed—the fact that many licensed medicines have been shown to induce cancer in rodents. It was acknowledged that rodent cancer tests can give very misleading results, due to factors such as hormonal disturbance, chronic irritation, and stimulation of rodent-specific receptor molecules. It is also widely accepted that studies are poorly designed, using unrealistically high doses of chemicals. For this reason, the results are often considered irrelevant to

²²² Broadhead, C. L. *et al.*, "Prospects for reducing and refining the use of dogs in regulatory toxicity testing of pharmaceuticals", *Human and Experimental Toxicology*, vol. 19 (2000), 440–47.

human risk assessment. Nevertheless, the tests are useful for identifying potent carcinogens. Another factor mentioned was the clinical risk/benefit calculation, where a clinician must decide whether the risks of adverse effects from a particular treatment outweigh the risks of withholding treatment. The use of medicines with known adverse effects in animals may or may not be justifiable, but the information on risk is essential.

19. The number of people who suffer from ‘Adverse Drug Reactions’ is often cited as evidence that animal tests fail to protect people from toxic medicines. The point was made that the majority of such cases were due to poor practice and overdosing. Others argued that the figures often cited for Adverse Drug Reactions had already taken such factors into account.²²³ The risks associated with potent medicines may be well defined, but inappropriate use cannot always be prevented.

20. It was concluded that all chemicals have toxic effects at high enough doses. The purpose of the animal experiments is to estimate the potency of the chemical so that margins of safety can be established.

Can there be absolute and objective measures of toxicity?

21. It was considered that toxicity is a deviation from normal which is not absolute, short of death, but that many forms of toxicity can be measured objectively.

What is a realistic timeframe for the reduction of animal use in toxicology by (a) 20%, (b) 50% and (c) 90%? Can the complete elimination of animal use in toxicology ever be envisaged?

22. There was general agreement that a 20% reduction could be achieved very quickly by means of harmonisation of test guidelines, reductions in the number of animals used in each test, and greater use of available alternative methods. A 50% reduction would require considerably more development and scientific research but was feasible within 10 years. A 90% reduction would probably take at least 20 years, and would need a major breakthrough in modelling of biokinetics (mathematical methods for predicting uptake, metabolism and excretion of chemicals in the body) and/or a rapid development of toxicogenomics (molecular biological techniques).

23. Funding of research on alternatives was considered to be poor. At the EU level, research funded by DG Research has not led to the development of any new tests. In the UK, there is some support provided by the APC and potentially by the MRC, but there appears to be a lack of high quality applications for work in this field. A new approach was considered essential to identify promising areas of research, raise the status of alternatives-related research, and provide funds on a large scale.

24. For chemicals testing, a forum for discussion is needed, analogous to the International Conference on Harmonisation (ICH) for pharmaceuticals.

25. Some members of the group believed that complete replacement of animals in toxicology was possible as long as there was sufficient will and determination. A minority view was that all animal testing could be replaced immediately, although it was acknowledged that this was not the accepted view of most scientists and regulators, and that changing these attitudes was probably a long-term objective.

Which research areas are most likely to lead to the replacement of animals in toxicology (e.g. computer modelling, in vitro human tissue testing, or in vitro animal tissue testing)?

26. The group agreed that the three examples quoted are important areas but that progress could also be made by making greater use of human volunteer studies and that the development of computer based biokinetic/pharmacokinetic modelling was fundamental to the successful application of in vitro tests.

27. The use of human tissue suffers from problems of supply which need to be addressed urgently. The use of ‘humanised’ cells (mammalian cells containing inserted human genes) could also be helpful.

²²³ See, for example, Lazarou, J., Pomeranz, B.H., Corey, P.N. Incidence of Adverse Drug Reactions in hospitalised patients: a meta-analysis of prospective studies. *Journal of the American Medical Association*, Volume 279 (15), 1200-05 (1998).

28. New molecular techniques such as toxicogenomics and metabonomics were considered unlikely to be useful in replacing animal tests but could be effective in reducing animal use or in developing refined test designs.

29. Ultimately, an increased understanding of the mechanisms of toxicity, e.g. sensitisation, irritancy and carcinogenicity, will lead to the rational design of in vitro tests.

Does the search for alternatives focus too much on replacement? Is sufficient attention given to reduction and refinement?

30. Considerable advances have been made in reduction and refinement, for example in the acceptance of alternatives to the oral LD50 test. Harmonisation of guidelines is also a very effective reduction strategy.

31. The development of new alternative methods as replacements usually requires more financial support because it involves a great deal of laboratory work, and extensive inter-laboratory validation studies. In comparison, the development of reduction and refinement alternatives is generally less costly and their introduction less contentious; extensive validation is usually not required. Education and training is a particularly important and cost-effective strategy for promoting the use of alternatives, good study design and improved animal welfare.

32. The group considered that the three Rs are inter-linked and should all be the subject of research.

What are the obstacles to promoting alternatives in toxicology?

33. The demand in the USA for testing chemicals for endocrine disrupting properties was cited as an example of testing driven by legal requirements rather than sound science. This and several other examples, such as testing for effects in juvenile animals and for behavioural endpoints, were considered to relate to a general problem of regulators in the USA exercising a high level of individual power.

34. In Europe, the current legislation on chemicals requires the submission of the results of prescribed sets of tests; the 'checklist' approach. Unnecessary or irrelevant testing may be done simply to complete a required data set. It is hoped that the proposed new EU chemicals strategy will be based on a sensible, structured approach to testing.

35. The group considered that some animal testing was done for 'administrative', rather than scientific reasons. More flexibility and intelligence is needed in chemical testing.

36. The main obstacle to the validation of alternative methods is the poor quality of the data from the corresponding animal test with which the new method is compared. Even when sound data exist, obtaining test results from chemical companies is often a problem. A way forward must be found to enable validation to proceed without the need for animal test results.

37. Acceptance of alternative methods by the OECD is crucial to their widespread use in toxicology. This has proved to be an extremely slow process.

Report of Working Group 3: Freedom of Information

Chair/Rapporteur: Dr Jon Turney (UCL)

Section 24 of the 1986 Act

1. Section 24 of the Act does not, in theory, work as a blanket ban on the distribution of any information held by the Home Office relating to animal experiments. The Home Office does not accept that all information is confidential and it considers all requests for information. Animal welfare groups asserted that, in practice, the Home Office has cited section 24 as a reason for withholding information.

2. Section 24 should be repealed because, in practice, little information is considered by the Home Office to be non-confidential and little is therefore released to the public on request. Repealing

section 24 would help to change the culture of secrecy at the Home Office in line with the principles of openness outlined in the Freedom of Information Act 2000.

3. By itself, however, repealing section 24 would not be sufficient to enable the public to access information. Under the Freedom of Information Act, section 38 (relating to putting individuals at risk) and section 41 (relating to confidential information) could still be used to prevent the release of information about animal experiments into the public domain.

Duplication

4. Some felt that duplication was a real problem. Others argued that it was an essential part of the scientific process. As in other areas, more transparency could prevent unnecessary duplication and reassure the public when duplication was necessary.

Involvement of Animal Welfare Groups in Cost/Benefit Assessment

5. Cost/benefit assessment is a moral and subjective judgement and should reflect public opinion rather than the opinions of a narrow group of scientists, as at present.

6. Animal welfare groups do not wish to be involved in licensing because it would conflict with their remit, involving them in the regulation of animal experiments. Ethical committees do not have the resources to do a rigorous scientific review of the need for each animal experiment.

7. Welfare groups could be involved prior to licensing, on some sort of board for assessing the need for animal experiments, to which scientists could be brought to make suggestions for alternative experiments.

8. Animal welfare groups need to feel as though they could have an impact. For this to happen, and to allow for meaningful dialogue, there needs to be greater transparency and public access to information.

Information for the general public

9. Relevant government publications are currently difficult to access. More data need to be placed in the public arena, using the world wide web.

Role of Scientists

10. Scientists could help to increase understanding by avoiding the use of euphemistic language when referring to animal experiments, and by providing frank descriptions of what was done to the animals.

11. Failed experiments, not just those that were successful, should be written up and published.

12. Scientists do write up experiments that disprove hypotheses, because this is as scientifically important as experiments that proved hypotheses.

13. Scientists need to communicate about their experiments in a precise manner so that others can repeat the experiments. Lay summaries could be included in addition to the usual article written for other scientists.

14. Scientists should criticise other scientists in the glare of the media, not just in scientific journals.

The media

15. The media present the issues in a polarised manner and has treated all positions unfairly.

Education

16. Very few science graduates have participated in experiments on animals throughout school and a decreasing number during university education.

17. Issues about animals should be taught in schools on a philosophical basis in order to encourage children to think through the issues carefully. The debate should not refer just to animal experiments but how society uses animals in general, for example in food production.

Statistics

18. The published Statistics are not intended to enable public understanding, but are for statisticians. They are particularly unhelpful as they show only aggregated figures; however, even disaggregated figures would not be much better.

19. Suffering can not easily be recorded in a meaningful way. It might help to increase the number of severity categories and give some general descriptions about the type of suffering, in addition to cross-references to the Statistics.

20. Actual levels of suffering could be retrospectively reported, and related to broad categories of procedures or common experiments.

Training for scientists and laboratory workers

21. Scientists and laboratory-workers, particularly senior personnel, should be re-trained every few years.

22. The focus should not be on re-training but on continuing professional development.

Points made in Plenary Session

23. There is a need for more collaborative discussion groups.

24. The media is not one entity: some journalists and broadcasters are becoming more nuanced and responsible in their reporting of the issues.

Report of Working Group 4: Regulation and the Ethical Review Process

Chair/Rapporteur: Dr Jane Smith (Boyd Group)

Should the role of the Inspectorate be reviewed?

1. There was agreement that 21 inspectors had not been sufficient. Some members felt that the new target number of 33 would be sufficient; others that numbers are not the crucial issue. Whether numbers are sufficient depends on what precisely the role of the Inspectorate is to be.

2. It was noted that currently over half of all inspections are unannounced, reducing the validity of accusations of 'cosiness', and more such unannounced inspections would be welcomed by all.

3. There was disagreement about the extent to which the present inspection system is balanced. Certain participants argued that inspectors are not sufficiently disinterested, because nearly all have previously been licensed to work experimentally on animals. They therefore come from within the system rather than sitting outside of it. For this reason, some maintained that there should be inspectors charged solely with animal care and welfare, who had never held licences, and could act as the animals' advocates. Others argued that this role was already provided for by the NVS/NACWO team.

4. It was agreed that there is currently a lack of transparency in the workings of the Inspectorate. For example, the proportion of project licence applications that are turned down both (i) initially; and (ii) even after final resubmission, is neither published nor known to welfare and other campaigning organisations. Moreover, it is unclear how severity limits and bands are defined and how the cost benefit assessment is applied in practice. There was consensus that more openness is needed.

5. It was noted that separating the roles of the Inspectorate into (i) inspecting; and (ii) providing expert advice would increase the demands on the Inspectorate as the 'inspecting' Inspector would not already have the detailed, contextualised knowledge of the project licence. With more inspectors, a greater degree of team working and specialisation within the Inspectorate would be feasible. It was agreed that there was a need for more independent enquiry in cases of criticism of the Inspectorate or alleged wrong-doings under the Act.

How could the Ethical Review Process be improved?

6. It was agreed that ERPs should have true external members. There was debate about whether these should be strictly 'lay'; who should be classified as a lay person; and who would command the

confidence of the wider community. It was agreed that there was a need for feedback on the contribution that lay members have made, and could make, within the ERP.

7. Members disagreed as to whether an anti-vivisectionist could be a member of an ERP and whether anti-vivisectionists counted as 'lay people'. Some anti-vivisectionist participants indicated that they would, in any case, not wish to be involved in an ERP.

8. It was suggested that, in order to represent the interests of animals, there was a need, not only for 'lay' people, but also for independent external experts in animal welfare.

9. It was observed that it was difficult for lay people to challenge the claim that knowledge per se is a benefit. Those in favour of animal experimentation could always argue that there might be instrumental (e.g. medical) benefits from almost any scientific procedure at some point in the future.

10. Some participants felt that ERPs duplicate the work of the Inspectorate; others that ERPs and the Inspectorate complement one another. At present ERPs technically only advise certificate holders and the role of ERPs would therefore change if they were to have the power to approve minor amendments. Although there was some support for moving to a system in which ERPs could approve very minor or welfare-friendly amendments to project licences, there was also some reluctance on the part of participants who were members of ERPs to move too far into a judgmental, rather than an advisory role.

Are levels of bureaucracy having an adverse impact on (a) animal welfare, and (b) scientific research in the UK?

11. It was observed that it is difficult to comment on the impact of bureaucracy because every case is different. It could take considerable time to gain approval for a PPL, but it was agreed that this is often for good reasons and is not always the 'fault' of the ERP and/or Inspectorate. Project licences last for five years, and it can take time to get such wide ranging documents right. There was disagreement as to the extent to which such delays really hold back UK science.

12. There was more agreement, however, that the process of approval for applications for minor amendments to projects can be unnecessarily cumbersome. If an ERP approval process were to be available for minor and welfare-friendly amendments, there would be a need to define 'minor'. It was noted that this question already occurs in the context of fast tracking minor amendments by ERPs. Although many ERPs have their own guidelines on what counts as "minor", it would be impossible to draw up a definitive list, even within a single establishment. A case-by-case approach would be more appropriate and trust in the NVS and NAWCO is crucial.

13. There was disagreement about the extent to which members of the Inspectorate are consistent with regard to the detail that they require on project licences. One person maintained that such differences are not great and that the Inspectorate goes to great lengths to minimise them; another person maintained that some Inspectors actively help project licence applicants to write their applications so as to allow for their flexible interpretation whilst other inspectors require great specificity.

Attendance

The conference was hosted by Members of the Select Committee. The delegates were:

Dr James Anderson	Home Office
Ms Kathy Archibald	Animal Aid
Professor Michael Balls	ECVAM
Professor Colin Blakemore	Oxford University
Dr Phil Botham	British Toxicology Society
Dr Kenneth Boyd	Boyd Group
Professor Caldwell	British Toxicology Society
Dr Pete Clifton	British Psychological Society
Ms Jan Creamer	NAVS
Mr Roger Ewbank	Institute of Biology
Dr Simon Festing	AMRC
Ms Rebecca Ford	Advocates for Animals
Mr John Gregory	Institute of Animal Technology
Mrs Barbara Holgate	ABPI
Dr Bryan Howard	Laboratory Animals Science Association
Dr Maggy Jennings	RSPCA
Dr Sheila King	Wellcome Trust
Dr Joanne Knight	Lord Dowding Fund
Dr Chris Langley	Dr Hadwen Trust
Dr Gill Langley	Dr Hadwen Trust
Dr Roger Lock	University of Birmingham
Ms Maggie Leggett	Physiological Society
Dr Mark Matfield	Research Defence Society
Mr Dragan Nastic	World Society for the Protection of Animals
Dr Tony Peatfield	MRC
Dr Barry Phillips	RSPCA
Mr Tim Phillips	NAVS
Dr David Smith	ABPI
Dr Jane Smith	Boyd Group
Dr Clare Stanford	Laboratory Animals Science Association
Ms Michelle Thew	BUAV
Mr David Thomas	BUAV
Dr Jon Turney	University College, London
Mr Martin Walsh	Home Office
Mr Les Ward	Advocates for Animals
Dr Greg Whelan	Laboratory Animals Veterinary Association

APPENDIX 5

List of Witnesses

The following witnesses submitted evidence. Those marked with an * gave oral evidence.

The oral evidence is published in Volume II (HL Paper 150–II).

The written evidence listed is published in Volume III (HL Paper 150–III).

- * Advocates for Animals, Mr Les Ward
- Animal Aid
- Animal Health Trust
- * Animal Procedures Committee
- * Association of British Pharmaceutical Industries (ABPI)
- * Association of Medical Research Charities (AMRC)
- Association of Veterinary Teachers and Research Workers, Belfast
- AstraZeneca
- B & K Universal Group Ltd, Professor G C Bantin
- Baker, C C & R P
- * BBSRC (Biotechnology and Biological Sciences Research Council)
- BioIndustry Association
- * Blakemore, Professor Colin, Waynflete Professor of Physiology, University of Oxford
- Boyd Group
- British Embassy, Bonn (Science Attaché)
- * British Embassy, Paris (Science Attaché)
- * British Embassy, Tokyo (Science Attaché)
- * British Embassy, Washington (Science Attaché)
- British Heart Foundation
- British Medical Association
- British Pharmacological Society
- British Psychological Society
- British Toxicology Society
- * British Union for the Abolition of Vivisection (BUAV)
- Burden, M
- Butcher, Dr G A, Imperial College of Science, Technology and Medicine
- * Clark, Professor Stephen, Department of Philosophy, University of Liverpool
- * Coleman, Dr Robert, Pharmagene Plc
- * Coleman, Professor Vernon
- * Council for the Heads of Medical Schools
- * Dawkins, Professor Marian, Head of Animal Behaviour Research Group, University of Oxford
- * Defence, Ministry of, Dr Lewis Moonie, MP, Parliamentary Under-Secretary of State
- * Doctors and Lawyers for Responsible Medicine (DLRM)
- * Dr Hadwen Trust for Humane Research
- Education and Employment, Department for (Department for Education & Skills)
- * European Centre for the Validation of Alternative Methods, Professor Michael Balls
- Europeans for Medical Advancement (Ray Greek & Jean Greek)
- * Expert Group on Efficient Regulation, Professor Iain F W Purchase
- * Farm Animal Welfare Council, Dr Judy MacArthur Clark
- * Festing, Dr Michael (Royal Society)
- * Fund for the Replacement of Animals in Medical Experiments (FRAME)
- GlaxoSmithKline
- * Goldberg, Professor Alan Center for Alternatives to Animal Testing, USA
- Greenwood R E S, Greenwood Ellis & Partners (Veterinary Surgeons)
- Hall, Chris and Margaret
- Health & Safety Executive
- * Health, Department of, Lord Hunt of Kings Heath, Parliamentary Under-Secretary of State
- Henretty, Julie Ann
- Heywood, Dr Ralph
- * Home Office, Angela Eagle MP, Parliamentary Under-Secretary of State
- * Home Office (Animal Procedures and Coroners Unit)
- * Home Office Inspectorate

- Horserace Betting Levy Board (Veterinary Advisory Committee)
 Howard, Dr B R, University of Sheffield (Antibody Resource Centre)
- * Huntingdon Life Sciences Group plc
 Iles-Wright, Mr C M M
 Institute of Animal Technology
 Institute of Biology (and Affiliated Societies)
 Institute of Food Research
 - * Inveresk Research
 Jowett, Mrs Christine
 Kneebone, Valerie
 Laboratory Animal Breeders Association of Great Britain
 Laboratory Animals Science Association (LASA)
 Laboratory Animals Veterinary Association (LAVA)
 LHASA Limited, Dr P N Judson
 Mae-Wan Ho, Dr
 Martin, Professor J F, University College London (British Heart Foundation Laboratories)
 - * McCracken, Mr Robert (member of the Animal Procedures Committee)
 - * Medical Research Council
 Merck Sharpe & Dohme Research Laboratories
 Moore, Dr Edward
 Morton David B, University of Birmingham
 Morgan Dr Delyth (on behalf of Lord Winston)
 - * National Anti-Vivisection Society (NAVS)
 National Kidney Research Fund
 Naturewatch
 Nicholas, Dr D J
 Noble, Professor Denis
 Parkinson's Disease Society of the United Kingdom
 - * People for the Ethical Treatment of Animals (PETA), Dr Troy Seidle
 Pfizer
 Physiological Society
 - * Pro Anima (see DLRM)
 - * Purchase, Professor Iain F W
 Quaker Concern for Animals
 - * Research Defence Society (RDS)
 Robertshaw, Major Alan (retired)
 - * Rothwell, Professor Nancy
 Royal College of Obstetricians and Gynaecologists
 Royal College of Pathologists
 Royal College of Physicians and Surgeons, Dr K R Paterson
 - * Royal Society
 - * Royal Society for the Prevention of Cruelty to Animals
 Royal Society of Edinburgh
 Royal Statistical Society
 - * Royal Veterinary College
 Russell, Dr Susan
 Russell, Mrs Gillian
 Ryder, Dr Richard (Deputy Treasurer of the RSPCA)
 SafePharm Laboratories
 Scientists for Accountability in Biomedical Research and Education (SABRE)
 Scottish Association for Marine Sciences, National Environment Research Council
 Seriously Ill for Medical Research (SIMR)
 Society for the Study of Fertility, St George's Hospital Medical School
 Stuart, Dennis B
 - * Trade and Industry, Department of, Lord Sainsbury of Turville,
 Parliamentary Under-Secretary of State
 Turtle, Henry
 - * UK Life Sciences Committee (Animal Science Group),
 UMIST
 - * Universities Federation for Animal Welfare (UFAW)
 Universities UK

- University of Bath, Professor J M W Slack
 University of Birmingham
 University of Cambridge, G P Allen
 University of Cambridge, Professor L B Jeffcott
 * University of Cambridge, Professor W R Allen, Thoroughbred Breeders' Association
 University of Leeds, Professor John Turner
 University of Oxford, Central Ethics Panel, David R Holmes
 University, Cardiff/Prifysgol Caerdydd, Professor John King
 University, Queen's, Belfast, Dr C M Scholfield, Department of Physiology
 Walton of Detchant, Lord
 Wellcome Trust
 * Winston, Professor the Lord
 William Harvey Research Institute, Professor Iain MacIntyre
 Wolfson Centre for Age Related Diseases, Professor Leslie Iversen

Evidence was also received from the following. It has not been printed, but is available for inspection at the House of Lords Record Office (020 7219 5314)

Anonymous	M Y Fowler	Mrs C Manders
Mrs Dorothy Adams	Ms Lorraine Garfield	Mrs B R Marshall
Mrs G Albinson	Nicholas Gausling	Mrs J Mate
Mrs M Ashton	Gene Watch	Gerald Mills
Mrs Rachel Astill Dunseith	Genetic Interest Group	Gillain Muir
Mrs C E Bailey	Ms K Gerard	Ms Y Nicola
Mr Tim Barford	Miss Kerry Gerard	Miss J M O'Malley
Irene M Barnes	Mrs S Giles	Ms C Oosterwyk
Mr K Batkin	Jill Greenway	Ms S K Parrish
Mrs Jane Beare	L Gregory	I Parry
Mr Philip Beaver	Mr & Mrs Grundy	D Pearson
C O Beck	Mrs Jean Heasman	Alison Perrott
Mme Norma Benny	Mr K Hellman	Mr P Phillips
Isla Bourke	Revd. G D Hill	Mrs V R Pike
Mrs Katheline Boyd	Stuart Hoad	Ms V Pilgrim
Mrs G Britton	Miss Debbie Holmes	Mr & Mrs Plimbley
Ms Margaret Bruce	Mrs D Holt	Mrs M Pooley
Ms Cathy Bryant	Mrs D Hope	D Prior
Pauline Burgess	Dr & Mrs B Hopton	Pat Rattigan, British
Mr P Burston	B Howeth	Antivivisection Association
Dr Eleanor Burt	Angela Hudson	Ms G Rawlings
Miss Joyce Butters	M Imeson	Ms Anna Reeves
T Canham	Lawrence Arnold Jackson	Mrs C M Richardson
Mrs HM Chatfield	Ms Maureen Jaffrey	Ms P Rollo
Ms R Chenery	Mrs D Jamieson	Ms G M Ryan
Mrs June T H Chester	Mrs Anne Jesper	Mr C Seal
Compassion in World	Mr G Jupp	Mr B Sharma
Farming	Joan Keen	M Sidell
Mrs B Collins	Emma Kelloway	Richard & Francis Smith
Erica Connolly	Alastair Kent	Kenneth John Smith
Mrs Carole Corpe	Barry Kew	Deborah Sparkes
Mr W Corson	J Kinsey	V Stery
Mike Cox	Mrs J Larsen	Mr D J Stevens
Mrs B L Cox	D Morgan-Leating	Ms Stone
Sarah Curtis	Roger Lee	Deborah Templeman
Dr Cuthbert	A K Lewis	Mr A M Theobald
Mr Colin Deacon	Ms Monica Lilley	M A Thompson
Karl Drinkwater	Mr M Lillington	Mrs M A Thompson
Mr Phillip Duckworth	Ms Brigitte Lorenz	Caro Louise Trimarco
Mr L Eldridge	E Mallaband, Animal	Dr Jack Turner
Jacqueline Evans	Welfare Concern	C Tweed

Alyson Tyler
Ann Vincent
Mrs Webb
Mr Dave Wetton

Miss Catherine White
Mrs J Williams
Helen Williamson
Mrs J Wood

Mrs T Wright
Mr C K Yeo

The following wrote in support of Professor Vernon Coleman

Anonymous
Jean Alger
John S Amsden
Mr L Arrowsmith
Mrs S Ayers
Mrs Bage
Mrs C E Bailey
Mrs Baker
Deirdre Balaam
Miss Verity Barker
Ms L Barker
Mr J Barr
Siobham Barrett
Neil Bartlett
R Barton
Mrs B Bates
Mr M Beckett
Barbara Bennett
D Block
Kathryn Booth
Mr A Bowers
Mrs A Boynton
Mrs O Branston
S Bratty
Hannah Brennan
John Brennan
Seamus Brennan
Kim Brennan
Johnny Brennan
Mr Roderick Bridge
Mr S Brooks
Mrs M Brooks
Brian W Burnett
Mr R E Butcher
B Byron
Mary Cairns
Mrs Campbell & family
Madeline Carritt
Mrs R A P Causer
S Chalkney
Mrs Sylvia Chamberlain
D G Chapma
R M Clarke
Mrs R Collins
Mr W Corson
Miss B M Costigan
W M Coward
Mrs Cowley
Mrs Heather W Cox
Miss J E Cugley
Mrs E Cugley
Miss L V Cull
Mrs P Cusich

Mrs I D'Arcy
Ms F Deadman
Derry
Susan Dickens
Mrs A Doran
Christine N Doyle
Mr Phillip Duckworth
Mr Norman Duff
Mrs Jackie Duffin
Ms C Durr
Jacqueline Evans
Mrs P V Everest
Mr D Fillingham
I Finlayson
Mrs Rosaleen Fitzpatrick
Mrs L I Fleetwood
Ms C Floyd
Miss J L Fogg
Mr Alex Forrest
Colin Foster
Mrs K Fox
Matthew Franklin
Ms E Gallop
Mrs M Gardner
Mrs G A Golds
P Gordon
G Gerner
Mrs H Graeme
Miss Green
Marcia Gulliford
Jennifer Guy
Lorna Guy
Martin Guy
Alec Guy
David Hall
Caroline Harding
Mrs Sara Hartley
Mr R Hartley
Ms B Hearnden
Paul Heyhoe
Mrs M K Hickman
Mr J V Holton
Ms G Horley
Mr P Hounsell
Mrs P Howard
Mr B Hubbard
Ms P E Hughes
Steven Hutton
F Inglis
Mr M E Jallard
Mr R James
Ms Dell James
Maureen Jones

Miss K King
Ms E Kinghorn
Mrs Pamela Kinnunen
Mrs A Krismam
Sarah Lawrenson
R O Laycock
Miss S K Le-Bôt
R C H Lillywhite-Bailey
Mr D Llewellyn
Philip Magor
M J Maines
Thomas Male
K Mann
Mr D Markham
Mr S McGrath
Mr J N McLean
L McLinden
Mrs Christine Micklefield
Mr A R Miller
Gerald Mills
Mr J Mimmagh
Mr & Mrs Mitchell
June Munk
Sharon Naumburger
Mrs P H Nelson
Mrs E A Nichols
Ms Y Nicola
Mrs O'Shiers
Miss Dawn O'Sullivan
V O'Brien
Mrs S Ormshaw
Miss Eileen Owen
Laurence Parker
O Parry
Mr R Parry
Katherine Perlo
Ms S R Perrins
Mrs Anne Phair
Mr P Phillips
Miss L Phipps
Miss Elaine Platt
Mrs S Plimbiley
Mrs M Pooley
Post Office, Ashton-In-Makerfield
Mr & Mrs Preston
Ms J Quinlan
Mr & Mrs Mate
Suzanne Reeves
Mrs B J Remington
Poisons Research Organisation

Benefiting the Environment (PROBE)	Mr I Smith	Mrs Wills
Mr M Richards	Miss K Somers	R Wilson
Mr P Richardson	Mrs S R Stebbings	Kevin Winstanly
M G Roberts	Miss R Stepanek	Michael Winstanly
Mr D & Mrs M Roberts	Ms Sandra Talbot	Melvin Winstanly
S G Ryan	Mr Peter Taylor	Robert Winstanly
Mrs Janet Salmon	Mrs K M Threlfall	D Wood
Mr David Salmon	Mrs V Titchener	Ms Maria Wood
Mr S Sarworth	Ms Janet Tomlinson	Ms Judith Wood
Mr Shaw	Mrs M Tordoff-Durn	D G Wood
Ms M Sinden	Mrs E Treby	Ms A Woof
Isobel Skaysbrooke-Read	Mrs M Watkins	J Woollard
Mary Slack	Mrs June Weaver	Mrs J Worrall
Mr R Slater	Mrs C J Webb	L Worsley
Mr K Smith	Mrs Webb	P Yate
Mrs E Smith	E White	L Young
	D Williams	

APPENDIX 6

Glossary

AAALAC	Association for the Assessment and Accreditation of Laboratory Animal Care
ABPI	Association of the British Pharmaceutical Industry
The 1986 Act	The Animals (Scientific Procedures) Act 1986
APC	Animal Procedures Committee
AWAC	Animal Welfare Advisory Committee (see Chapter 3, Defence Research)
BBSRC	Biotechnology and Biological Sciences Research Council
BUAV	British Union for the Abolition of Vivisection
DLRM	Doctors and Lawyers for Responsible Medicine
DoH	Department of Health
ECVAM	European Centre for the Validation of Alternative Methods
ERP	Ethical Review Process
FAWC	Farm Animal Welfare Council
FRAME	Fund for the Replacement of Animals in Medical Experiments
GM	Genetically Modified (see Chapter 8)
IACUC	Institutional Animal Care and Use Committee (in USA)
ICH	International Conference on Harmonisation
<i>In silico</i>	Research done using computer methodologies
<i>In vitro</i>	Research done “in glass”, in test-tubes or other mechanical apparatus, often using human or animal tissue
<i>In vivo</i>	Research done in living animals
MOD	Ministry of Defence
MRC	Medical Research Council
NACWO	Named Animal Care and Welfare Officer
NAVS	National Anti-Vivisection Society
NVS	Named Veterinary Surgeon
OECD	Organisation for Economic Co-operation and Development
OLAW	Office for Laboratory Animal Welfare (in USA)
PETA	People for the Ethical Treatment of Animals
RSPCA	Royal Society for the Prevention of Cruelty to Animals
<i>Statistics</i>	Home Office <i>Statistics of Scientific Procedures on Living Animals</i> , Great Britain, 2000
Three Rs	Reduction, Refinement and Replacement (see Chapter 1)
UFAW	Universities Federation for Animal Welfare
USDA	United States Department of Agriculture