Report of the Animal Procedures Committee for 2005

Laid before Parliament by the Secretary of State for the Home Department pursuant to Section 20(5) of the Animals (Scientific Procedures) Act 1986, and on behalf of the Northern Ireland Minister of Health, Social Services and Public Safety pursuant to Section 20(5), as modified by Section 29, of the same Act.

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ANIMAL PROCEDURES COMMITTEE

Membership as at 31 December 2005

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Genevra RICHARDSON LLB LLM – Professor of Public Law, Queen Mary, University of London

Secretariat
Richard West
Philip Brenner
Anna Paterson (to January 2005)
Joanna Tuckwell (January to July 2005)
Leah Davis (October to December 2005)

CHAIR'S LETTER TO THE RT HON DR JOHN REID MP, SECRETARY OF STATE FOR THE HOME DEPARTMENT AND TO PAUL GOGGINS MP, THE NORTHERN IRELAND MINISTER FOR HEALTH, SOCIAL SERVICES AND PUBLIC SAFETY

I have pleasure in submitting to you the Animal Procedures Committee's Annual Report for 2005.

I took over the chairmanship of the committee at the beginning of 2006 from my predecessor, the Reverend Professor Michael Banner, and would like to pay tribute to him for his leadership of this important advisory committee over the last eight years. This annual report sees the culmination of the work he presided over in the ten year review of the Animal (Scientific Procedures) Act 1986.

Experimentation on animals for scientific research has remained a highly contentious area throughout the period of this report and beyond. The APC, a body of very diverse individuals donating their time and expertise in the public service, offers independent advice to Ministers in this challenging area. I am sure Ministers appreciate the range of reports and licence applications with which the APC has dealt, and the efforts of our members and secretariat to assist Ministers in the sensitive and difficult decisions involved.

SARA NATHAN

INTRODUCTION

This report describes the work carried out during the year 2005 by the Animal Procedures Committee.

2. The Committee is established by the Animals (Scientific Procedures) Act 1986 (the 1986 Act) to give advice to the Secretary of State on the use of animals in scientific procedures. Two important requirements of the 1986 Act are:

- It shall be the duty of the Animal Procedures Committee to advise the Secretary of State on such matters concerned with the Act and his functions under it as the Committee may determine or as may be referred to the Committee by the Secretary of State; and

- In its consideration of any matter the Committee shall 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.

3. Annex A to this report sets out some information about the Committee, including its legislative background, the Ministers it reports to and its membership. On joining the Committee, members agree to be bound by a Code of Conduct which appears at Annex B. Among other things this requires them to *'declare any personal or business interest which may, or may be perceived (by a reasonable member of the public) to influence their judgement'*. A register of members' interests appears on the APC website.

4. The full Committee met five times during 2005, and in addition there were numerous sub-committee and working group meetings. As in previous years we also held a weekend conference which provides an additional and useful forum for learning and discussion. Annex C details the membership of the Committee's sub-committees and working groups.

5. In accordance with guidelines from the office of the Commissioner for Public Appointments, the Committee operates a performance appraisal system. Each year the Chair assesses each member's performance against the following criteria:–

- Adherence to the Committee's Code of Conduct;

- Attendance at meetings of the full Committee; at sub-committees and working groups; and at the Committee's annual conference;

- The member's contribution to the general work of the Committee in terms of his or her particular skills and experience.

A member is able to comment on the appraisal, and if desired make representations about it to a senior Home Office official. Ministers take these appraisals into account when deciding whether a member should be re-appointed. The Chair's performance is also assessed, using similar criteria, by a senior Home Office official.

6. The highlights and main points of the Committee's work in 2005 were as follows:

- The advice we offered on licence applications

- Work carried out by our sub-committees

- The completion of our review of the annual statistical report on animal procedures

- Our work on the retrospective assessment of suffering and severity

- The report concludes with the Committee's work plan for 2006.

THE COMMITTEE'S WORK DURING 2005

Applications

Background

1 The Home Office refers a small number of project licence applications to the Committee for advice. After the revisions outlined in our previous annual report, from January 2005 the categories of applications referred include:

- any involving the proposed use of wild-caught non-human primates;
- any involving the proposed use of cats, dogs, equidae[1] or non-human primates in protocols of substantial severity;
- any projects with a substantial severity banding, or major animal welfare or ethical implications, involving (a) xenotransplantation[2] of whole organs, or (b) chronic pain models, or (c) study of the central nervous system;
- applications of any kind raising novel or contentious issues, or giving rise to serious societal concerns. (For example, any application involving the genetic modification of non-human primates or embryo aggregation chimaeras[3] involving dissimilar species.)

Specific project licence applications referred to the Committee for advice

2. Two licence applications, both involving the use of non-human primates in procedures of substantial severity, were referred to the Committee in late November 2004 and considered in 2005. One was to carry out research on pedunculopontine nucleus (PPN)[4] and stem cell therapy in Parkinson's disease.[5] The other was to study the efficacy of antibiotics for the treatment of an infectious agent. These two applications were discussed in February 2005, first by our Primates Sub-Committee (PSC) then by the full Committee.

Stem cell therapy in Parkinson's disease

3. The work covered in the first application, to carry out research relating to stem cell therapy in Parkinson's disease, was the next phase of research carried out under an earlier licence. Although the PSC had some general concerns relating to the appropriateness of primate models for Parkinson's research, it considered that the application was well prepared and raised no issues that had not previously been considered. The PSC therefore recommended that the application be granted.

[1] **Equidae** – the *Equidae* family of mammals have a single functional digit although the second and third digits persist as splint bones. *Equids* include horses, asses and zebras. **NB** Certain technical and scientific terms are defined at their first occurrence in footnotes. They are summarised in a glossary at the end of the report, which also contains a list of acronyms used.

[2] **Xenotransplantation** – the transplantation of cells, tissues or organs from an animal of one species to an animal of a different species.

[3] **Embryo aggregation chimaeras** – A collection of embryos containing genetically distinct types of cells.

[4] **Pedunculopontine nucleus** – located in the brainstem, it is composed of a wide variety of neurochemical cell types and has been classically considered as one of the main components of the reticular activating system.

[5] **Parkinson's Disease** – a movement disorder often characterized by muscle rigidity, tremor, a slowing of physical movement, and ultimately a loss of physical movement and cognitive decline.

The efficacy of antibiotics for treatment of an infectious agent

4. The PSC had had serious concerns about aspects of the second application, to study the efficacy of antibiotics for treatment of an infectious agent, and had met with the applicants in January to discuss these. Key issues discussed at the meeting had been the identification of humane endpoints[6] and whether or not the use of untreated controls (animals infected with the infectious agent but not treated for it) was necessary in each round of the trial. The applicants anticipated that a pilot study, to be conducted and reported on prior to commencement of the main study, might provide information to assist in identifying endpoints for humane intervention. The applicants had also agreed to explore whether it would be possible to reduce the number of untreated controls used throughout the trial. However, it was not certain that this would be possible, as the requirement for controls was particularly strict in this case, because the work would take the place of clinical trials. Another issue was housing (whether or not telemetrised[7] animals could be pair-housed).

5. Having regard to the outcome of the discussion with the applicants about the way that the animals would be monitored, the use to be made of the pilot study for determining humane endpoints, the conduct of the experiments and the controls used, a majority of the PSC members were satisfied that the application should be allowed to proceed.

Our advice and the Minister's response

6. After discussion by the APC of the two applications and the issues arising, it was agreed that the Chairman should write to the Minister, advising that the first application be granted; and that a majority of the Committee was minded that the second application be granted, but referring to the Committee's concerns about particular welfare aspects of the work, especially the identification of humane endpoints.

7. The Minister replied that in the light of our recommendation that the first application be allowed, and having received further advice from the Animal (Scientific Procedures) Inspectorate, she had agreed that the earlier licence should be renewed. The Minister noted that we had recommended by a majority vote that the second application should be allowed, and said that she had taken careful note of our specific concerns. Saying that she had agreed to the granting of the licence, she said that she would ask the Inspectorate to ensure that a robust pilot study would be conducted to assist in determining humane endpoints; that there would be close monitoring to maximise the possibility of reducing the need to use untreated controls during each round of testing; and that animals would be housed together whenever possible.

A new system to consider applications

8. The two applications referred to above had been considered by the PSC before discussion in the full Committee. During 2005 we introduced a new system of considering applications, using the Applications Sub-Committee (ASC) for preliminary consideration rather than the PSC. In the light of the revised categories of applications to be referred to the Committee in future (paragraph 1 above) we wished to address the Home Office concern that any increase in the number of applications referred to the Committee might result in undue delay.

9. We concluded that a sub-committee mechanism was the only option for enabling a greater number of applications to be considered within the required timeframe, and that all applications referred to the APC, including those involving non-human primates, would be considered by the new ASC. This would free the PSC to spend more time on strategic issues. However, provision needed to be made for specialist primate expertise within the new sub-committee. We also decided that the ASC should have a partially rolling membership, in order to spread the burden of what might be a very busy Sub-Committee. Annex D is the *modus operandi* of the ASC.

[6] **Humane endpoint** – the point at which pain or distress is terminated, minimised or reduced by taking actions such as terminating a painful procedure; giving treatment to relieve pain or distress; or killing the animal.

[7] **Telemetry** – measuring temperature etc at a distance from the subject by monitoring radio signals transmitted from an electronic device which has been previously implanted in the animal.

10. The Home Office referred four further applications to us for advice in 2005. Two were discussed in June, first by the ASC and then by the full Committee. Representatives of the two organisations making the applications attended the meeting of the ASC, and we were grateful to them for the useful clarifications and explanations offered.

Training in murine[8] polio intraspinal[9] injections

11 Currently, safety testing of batches of polio vaccine for regulatory purposes is carried out using primates. However, we were informed that a proposed alternative test model using mice instead of primates was very close to being validated and accepted for regulatory use. We were told that the manual skills involved in the mouse test were extremely precise and demanding, so that training and regular practice using live mice was necessary, and demonstration of continuing competence was needed for regulatory acceptance. The process involved inoculations of inert dye into terminally anaesthetized mice in order to acquire the manual skills required. If the proposed test were approved and adopted, the licence application which had been referred to the Committee would enable this training and practice to take place.

12. We were pleased in principle to hear of this important potential change that would, if successful, eliminate the use of primates in this area of testing. However, we were concerned to establish the numbers of mice used, and the comparative severity of the two tests, so that we could carry out an informed assessment of the change from the primate to the mouse model. The current licence application was premised on the preferability of the new model. Therefore, the Committee thought it important to consider the merits of the move to the alternative mouse model.

13. As background we were given information by the applicant about the current primate test, although this was not the subject of this licence application.

14. Section 5(6) of the Animals (Scientific Procedures) Act 1986 has an outright prohibition on the use of primates if other species are suitable, but the move from primates to mice would use more animals than the primate test, and would arguably be more severe. However, the Committee took the view, in the light particularly of the special status given to primates, along with equids, cats and dogs, by the 1986 Act, that the introduction of the mouse test would, in this particular instance, be desirable, nothwithstanding the larger number of mice, as opposed to primates, which might be used. Testing of the actual polio virus causes paralysis, but we noted that even a very mild form of paralysis in an arboreal[10] primate would be likely to result in more psychological distress that in a ground living mammal such as a mouse. We also noted that for actual virus testing the mice would be euthanased as soon as only one limb became paralysed, so they would not be severely compromised in terms of their locomotor function.

15. We also noted that hitherto the Home Office had issued licences to acquire manual skills using terminally anaesthetized animals only if they related to microsurgery training. The House of Lords Select Committee on Animals in Scientific Procedures had recommended that this restriction should be relaxed, and the Government's response was that applications made for other categories of training in manual skills could be considered. We noted that this application related to a wider programme of work, which, as indicated, would finally lead to a reduction in the use of primates. Extension of manual skills training using animals is contentious however, and we therefore consider that any future applications for categories of training in manual skills other than microsurgery should also be referred to the Committee.

16. With one member abstaining, the Committee recommended that the Home Office should grant this application. However, we made the following points:–

[8] **Murine** – Pertaining to or affecting mice.

[9] **Intraspinal** – within the spinal dura (inner skin enclosing the spinal cord) within the spinal canal.

[10] **Arboreal** – tree-dwelling, pertaining to trees.

- We were assured that constant training in this manual skill was required in order to retain competency. However, we considered that there might be scope for using technology, such as imaging guidance, for insertion of the needle. This might sufficiently "de-skill" the technique to reduce the number of animals required. We therefore suggested that the applicants be asked actively to consider such a possibility, and that in three years, or sooner if appropriate, the Home Office review the licence in the light of any such modification of these procedures.

- Training using inert dye inoculations would be necessary only if there were insufficient batches of vaccine to be tested. We asked the Home Office to monitor the amount of vaccine testing in order keep the necessity for inert dye inoculations under review.

The Home Office accepted our advice, and our concerns were acknowledged by the inclusion of a number of additional special conditions to the project licence.

The use of primates in the investigation of Parkinson's disease

17. The second application that we considered in June involved the use of primates in the investigation of Parkinson's disease. We noted that it was from a leading research group with extensive experience in this area, which was seeking authority to continue ongoing work. Initially, the ASC considered that there was some lack of clarity in the application, particularly relating to supply and husbandry issues. At our meeting with the applicants we were satisfied with the further information provided and were grateful to them. Two members objected on ethical grounds to this work being licensed, but the Committee decided to recommend that the Home Office should grant this licence. In his reply the Minister told us that the licence would be amended to permit the continuing work.

Medical countermeasures against a possible infectious agent

18. Another licence application referred for advice in 2005 involved the development of medical countermeasures against a possible infectious agent. For security reasons we are not recording the details of the application in this report. This application was assessed by the ASC. In accordance with our new arrangement for considering applications it was not discussed by the main Committee, although all members had the opportunity to make comments. This was because of our undertaking to complete consideration of applications within 30 days (see Appendix E). The ASC formulated a number of questions about the application, and we were grateful to the applicants for the clarifications and explanations offered, which we found very useful. We asked questions about several issues, including the likely level of suffering of the animals; the number of animals that it was proposed to use; housing and husbandry issues; operative and post-operative care; and the application of the three Rs. We considered that the applicants provided full and reasoned responses on the issues raised, and with one member dissenting on ethical grounds, we recommended that the Home Office grant this application. The ASC reported its recommendations to the full Committee at its next meeting. In his reply the Minister said that on the further advice of the Inspectorate he had agreed that the licence should be granted. He said that he had asked the Inspectorate to ensure that the programme of work would be closely monitored to ensure that all further opportunities for further reduction and refinement were maximised.

The use of non-human primates in procedures of substantial severity for vaccine research

19. The last application referred to the Committee in 2005 involved the use of non-human primates in procedures of substantial severity for vaccine research. Again, it was assessed by the ASC without discussion in the main Committee, although all members had the opportunity to make comments and the ASC reported its recommendations to the main Committee at its next meeting. Also, for security reasons we are not recording the details of the application in this report. The applicants attended a meeting of the ASC, and we were grateful to them for their comments and explanations.

20. Our discussion focussed on the likelihood of the project yielding benefits, the necessity and justification of such work, the nature of the costs and the possibilities of reducing them. We formulated several questions about costs to the animals, including the necessity for single housing (including problems associated with telemetry); the provision of enrichment; the refinement and standardisation of welfare score sheets; and the preservation and dissemination of data and tissue. We considered that the applicants provided full and reasoned responses on the issues raised, and we concluded that the costs to the animals had been reduced appreciably. It was clear, however, that those costs were considerable.

21. A majority of the Committee was satisfied that a research programme based on and testing the proposed model was appropriate in the circumstances. We found it more difficult to assess the benefits of this project, but the majority of the Committee took the view that the project was justified. In his reply, the Minister said that he appreciated the concerns felt by the Committee that this application was particularly difficult and contentious, and he had taken careful note of our concerns. He said that in view of our advice and the further advice of the Inspectorate he had decided that the project licence should be granted. The programme would be closely monitored to ensure that all opportunities for reduction and refinement were maximised.

Work of the Primates Sub-Committee (PSC)

22. The role of the PSC is to advise the Committee on issues relating to the acquisition, housing, care and use of non-human primates in scientific procedures. In 2005 the membership of the PSC was Professor McNeilly (chair), Professor Atterwill, Dr Hubrecht, Dr Jennings, Dr Langley and Professor Pickard. The Home Office consults the PSC for advice on overseas breeding establishments seeking approval to supply primates to the UK for use under the 1986 Act. In 2005 the PSC considered the acceptability of five establishments as sources of primates imported for use in research in the United Kingdom; three in Europe and two in Asia. There follows a summary of our advice, which is anonymised for security reasons.

Centre 1

23. The PSC understood that approval was sought for a one-off consignment from this centre and there was no dissent about recommending approval for this purpose.

Centre 2

24. The PSC was minded not to recommend re-approval of this centre at the present time, due to concerns about quarantine practices: the quarantine accommodation that the centre provided and the centre's practice of splitting social groups for quarantine purposes. We understood that there were plans for new accommodation to be built and in use at the site before the end of 2005. The PSC therefore suggested that the request for re-approval of this centre should be deferred for consideration until after those improvements had been completed. We also noted that, if any UK user establishment had a genuine and urgent need to use animals from this centre prior to then, the centre could be assessed for approval as a one-off source.

Centre 3

25. The PSC noted the improvements made at the centre since the last Inspectorate visit and agreed that it should be recommended for re-approval, subject to certain conditions.

Centre 4

26. The PSC understood that a one-off approval was sought for imports from this centre, which was in the process of dismantling a breeding colony. The PSC was satisfied that a recommendation should be given for approval until closure of the breeding colony was complete.

Centre 5

27. The PSC was very concerned about the lack of improvement reported, and considered that the centre should not be recommended for re-approval as a supply establishment at the present time. In making its recommendation, the PSC paid careful regard to both the legitimate requirements of science and industry and to the protection of animals against avoidable suffering. The PSC was cognisant that its advice would have possible effects on UK establishments with current orders from the centre and that they might encounter difficulties in establishing another supply of animals. Overall, however, the lack of improvement, especially in relation to environmental enrichment, and the structural deterioration at the centre (with possible health and welfare implications for the animals), persuaded the PSC to recommend that the centre's approval should not be renewed at this time. The PSC noted that the Home Office might wish to offer the centre an opportunity for re-consideration in future, if genuine improvements are made in the meantime.

28. In 2005 the PSC also continued work on formalising existing criteria for its consideration of these establishments. It held several meetings, and received much assistance from the Inspectorate which carries out visits to overseas breeding centres. The PSC also sought to involve the main organisations which import primates. It expects to have a finalised report of this work by early 2006.[11]

The Research and Alternatives Sub-Committee

29. This Sub-Committee comprises Professor D Clark (chair), Dr Festing, Dr Jennings and Mr Moore. A member of the Inspectorate attends meetings as an observer. Since the budget for research into the three Rs was transferred to the NC3Rs the main work of the Sub-Committee has been to continue to monitor its existing research projects.

30. The projects that the Home Office continued to fund at the beginning of 2005 were as follows:

- Professor Dawkins (University of Oxford): *The effects of cage cleaning regimes in laboratory rat welfare.*

- Mr Hardwick (Higher Education Staff Development Agency): *To review, develop and merge the Multiple Choice Questions databases used by the two existing accrediting bodies.*

- Dr Mendl (University of Bristol): *Developing recommendations for rat housing using scientific assessment of welfare: interactions between cage size, space allowance and enrichment provision.*

- Professor Nicol (University of Bristol): *A targeted approach to environmental enrichment for laboratory mice.*

- Professor Wall (University of Bristol): *Development of an in vitro[12] rearing system for parasitic Psoroptes mites, to minimise the experimental use of infected vertebrate hosts.*

- Dr Xing (National Institute for Biological Standards and Control): *Development of an alternative test to the histamine challenge test based on in vitro enzymatic-HPLC coupled assay for pertussis vaccines.*

- Professor Adams (University of Stirling): *Vaccine efficacy testing in fish – replacement of disease challenges with serological testing.*

- Mrs Harris (Central Science Laboratory): *Evaluation and validation of electrochemiluminescent method for detection of Clostridium botulinum toxins A, B, E and F in foodstuffs.*

- Dr Irving (Centre for Environment, Fisheries and Aquaculture Science): *Use of the cockroach as an alternative to the mouse as a bioassay[13] animal for the statutory testing of shellfish toxin.*

[11] The report of the Primates Sub-Committee on overseas primate sources was sent to the Home Office in February 2006.

[12] **In vitro** – literally "in glass", ie in an artificial environment, outside a living organism.

[13] **Bioassay** – the shorthand for *biological assay*, a type of in vitro experiment, typically with the aim of measuring the effects of a substance on a living organism.

31. Two of these projects were completed in 2005, and brief reports about them are included below.

Use of insects as alternatives to mice as bioassay animals for the statutory testing of shellfish for biotoxins.

32. Dr. Stephen Irving and Dr. Alastair Cook at the Centre for Environment, Fisheries and Aquaculture Science developed a promising assay for paralytic shellfish toxins (PSP) using desert locusts which appeared to be capable of quantifying PSP toxins at levels of regulatory interest. Further refinements of this assay are required before it can be subjected to an inter-laboratory validation study with the view to replacing animal tests. However, for diarrhetic shellfish toxins (DSP), bioassays using desert locusts and cockroaches were not found to be satisfactory.

The results of this study was presented at the NC3Rs Animal Technicians Symposium on the 8th September 2005.

Development of an in vitro rearing system for parasitic Psoroptes mites, to minimise the use of infested vertebrate hosts.

33. Professor Richard Wall at the University of Bristol undertook investigations to identify in vitro rearing systems for Psoroptes mites that cause mange in a wide range of vertebrate animals in order to replace the current method of rearing them for research purposes in live animals. He and his co-workers established in vitro environmental requirements and dietary needs for the mites to survive and produce eggs outside the host animals. But unfortunately the larva did not survive long enough to complete the life-cycle, limiting the ability to rear these mites in vitro. Although this project has not been successful in delivering the stated objective, new information has been gained on the off-host behaviour of these mites.

Oral presentations

- *Miss K Pegler, University of Bristol, Biological Sciences Departmental presentation, Title: Sheep scab and the behaviour of Psoroptes ovis (Dec 2002).*
- *Miss K Pegler, Joint British Association of Veterinary Parasitology and Irish Society of Parasitology Autumn Meeting – Parasite Control, Central Science Laboratory, York. Title: Tactic responses of the parasitic mite, Psoroptes ovis, to light, temperature and gravity (Sept 2003).*
- *Miss K Pegler, University of Bristol, Biological Sciences Departmental presentation, Title: Morphology of Psoroptes mites (Nov 2003).*
- *Professor R. Wall, Lethbridge Research Centre, Agriculture & Agri-Food Canada, Alberta, Canada (March 2005).*

Poster presentation

- *University of Bristol, Biological Sciences School Research Meeting. Morphological analysis of Psoroptes mites (April 2005).*

Research publications

Pegler, KR. & Wall, R. (2004) Tactic responses of the parasitic mite, Psoroptes ovis, to light, temperature and gravity. Experimental & Applied Acarology, 33, 69-79.

Pegler, KR., Evans, L., Stevens, J.R. & Wall, R. Morphological and molecular comparison of host derived populations of parasitic Psoroptes mites (submitted to Medical & Veterinary Entomology).

Pegler, KR. Off-host behaviour and survival of the mite, Psoroptes ovis. PhD Thesis, University of Bristol. Expected submission – September 2005.

Education and Training Sub-Committee

34. In 2005 this Sub-Committee comprised Dr Jennings (chair), Dr Festing, Mr Kemp and Mr Moore. Last year we reported on the Sub-Committee's review of the training modules for personal and project licence applicants under the Animals (Scientific Procedures) Act 1986 (ASPA) and good progress was made with this in 2005. In this work the Sub-Committee sought to:

- provide an overview of current training requirements for both personal and project licensees;
- define core competencies and learning outcomes appropriate for personal licence applicants;
- propose revisions to the structure of modules 1 to 4; and
- identify issues requiring further consideration, including review of module 5 training for project licensees.

35. Throughout the year in conducting this review, the Sub-Committee consulted widely with those directly involved in the development, delivery and accreditation of modular training courses. In addition, four persons with expertise in training licensees were co-opted to the Sub-Committee to provide specialist advice. The Sub-Committee was extremely grateful for the co-operation and enthusiasm of all who participated. The Sub-Committee was also greatly assisted by a member of the Inspectorate, who attended meetings as an observer. A report of this stage of the review was prepared ready for submission to the main Committee early in 2006.[14]

Housing and Husbandry[15] Sub-Committee

36. The APC attaches great importance to the housing and husbandry of animals used in research, due to its importance for the lifetime welfare of the animals involved. The Housing and Husbandry Sub-Committee comprises Dr Hubrecht (Chair), Professor Broom, Dr Jennings, Mr Kemp and Dr Morris.

37. In our report for 2004 we described a successful programme of work where we held discussions at a stakeholder forum on good practice in the housing and husbandry of rats and mice and identified areas for further work. In 2005 we took this forward, and the main Committee accepted our suggestions of advice to be offered to the Home Office.

Training of Named Veterinary Surgeons

38. First, as a result of the stakeholder forum and its own discussions, the Sub-Committee noted concerns from Named Veterinary Surgeons (NVSs), on the scope of their role and the information available to them to perform this role. This was followed up by useful discussions with The Laboratory Animal Veterinary Association (LAVA) with respect to the role of the NVS including a presentation to the APC by the Association's President.

39. We agreed with LAVA and its members that the NVS role had become more complex in recent years. There had been an extension of the range of responsibilities, such as veterinary determination of whether animals should be kept alive at the end of regulated procedures, inclusion in the ethical review process, more advice requested on welfare and a trend to add managerial/compliance roles to the animal-care responsibilities.

40. The NVS's role as laid out in the Animals (Scientific Procedures) Act 1986 is to provide advice on animal health and welfare. To fulfil this role the medical skills of the veterinary surgeon have increasingly needed to be supplemented by expertise in ethology[16] and applied animal behavioural science that traditionally have not been part of the veterinary curriculum.

[14] The report of the Education and Training Sub-Committee on Modular training was sent to the Home Office in February 2006.

[15] **Husbandry (animal)** – the practice of breeding, raising and caring for animals.

[16] **Ethology**. The behaviour of animals in their normal environment. Applied ethology is an important aspect of animal welfare, and includes experiments to determine animals' preferences and also their reactions to farming and other practices.

41. We therefore suggested that the Home Office write to the Royal College of Veterinary Surgeons (RCVS), asking the RCVS to consider placing greater emphasis on applied animal welfare science and ethology in primary NVS training and education and continued professional development (CPD). We understood that this was an opportune time to make such a proposal, as such education was under review.

42. We hoped that this suggestion would allow NVSs to continue to provide sound science-based advice on health and welfare to the highest current standards. Having noted the extension of the NVS role in recent years, we considered it important to recognise that suggesting adding additional training and activities would add to the workload. We therefore suggested writing to LAVA also, recognising LAVA's role in providing CPD and expressing support for discussions within its membership on ensuring a balance between the core role of advising on health and welfare and managerial/compliance roles.

43. The Home Office accepted our advice and forwarded our letter to the RCVS on 20 June.

Clarification about funding bodies' preparedness to fund improvements in animal care

44. A second area of concern that was discussed at the stakeholder forum in 2004 identified that some scientists applying for grants felt that costs for improvements in animal care might not be covered, or that applying for such costs might adversely affect their chances of receiving funding. The Sub-Committee wrote to a number of major funding bodies to explore this further.

45. In general, we learnt that funding bodies specify that they require those that they fund to implement good standards of housing and husbandry. Some would consider funding requests for improvements especially if directly related to the study, but all considered that the institution's core animal care costs should allow current minimum standards to be met.

46. We identified a problem of perception: applicants for funding thought they could not always ask for money to improve animal care. Funding bodies, on the other hand, said they expected high standards for the work they funded and would consider offering funding to achieve this. This lack of understanding by applicants of funding bodies' policy seemed to be a potential barrier to achieving widespread high standards of animal accommodation, and one which might relatively easily be removed.

47. As a consequence, the Sub-Committee prepared a draft recommendation to funding bodies, suggesting that they clarify to grant applicants their policies on standards and funding of animal care and accommodation. The draft recommendation was circulated to the Medical Research Council, the Biotechnology and Biological Sciences Research Council and the Wellcome Trust for consultation and comment. The three bodies were generally accepting of the draft recommendation.

48. The APC therefore proposed that the Home Office write to funding bodies, making recommendations in the terms outlined below. Funding bodies should:

a) Clearly communicate what standards they expect for animal care and accommodation, and who is responsible for implementing those standards.

b) Clearly communicate what they fund with respect to animal care and accommodation and what they expect the institution to fund.

49. We hoped that this proposal would assist grant applicants better to understand funding bodies' policies and thus to remove the apparent barrier to achieving widespread high standards of animal accommodation.

50. The Home Office agreed both to write to the relevant UK funding bodies commending our recommendations, and to table our letter of advice at the next Home Office meeting with the funding bodies.

The Committee's review of the statistics of animal use

51. In July 2002, the House of Lords Select Committee on Animals in Scientific Procedures reported, and the Government published its response in January 2003. Recommendation 30 of the House of Lords report was that, "A formal consultation on the Statistics should be carried out with a view to making them easier to interpret". The Government response was that, "The Statistics of Scientific Procedures using Living Animals provide a wealth of detailed information. However the Government is conscious that they are not presented in a readily digestible form. We will review, in consultation with stakeholders, how they might be improved". On 5 June 2003, the then Home Office Minister Bob Ainsworth wrote to the APC Chairman, asking the APC to carry out a thorough review of the annual *Statistics of Scientific Procedures on Living Animals in Great Britain.*

52. As described in previous reports, we established a working group to take this work forward. The working group comprised Professor Bulfield (Chairman), Dr Festing, Dr Langley, Mr Moore and Professor Oliver. Two consultants, Dr Jane Smith and Dr Janice Pearce, assisted the working group, and its work was also assisted by an observer from the Inspectorate. The working group completed its work in 2005 and brought its final report to Committee's meeting on 13 April. The Chairman sent it to the Minister on 16 June. In his letter he noted that as envisaged by the House of Lords, our report made firm recommendations about how the presentation of the Statistics could be improved, in order to assist openness and transparency, and about the counting of genetically modified strains. We also made a number of other detailed recommendations, for example, about breakdown of the species listed, use of anaesthesia and the classification of the purpose of procedures. In all our recommendations we took account, as required by law, of the legitimate requirements of science and industry as well as the protection of animals. The Chairman stressed that the use of animals in science is a matter of controversy for some, and of concern to all. He considered it vital that debate about, and scrutiny of, such work should be informed by accurate and clear presentation of relevant data. The recommendations of the Report were aimed at advancing that objective, and he looked forward to the Home Office's response to it.

53. The full Statistics report has been published on our website www.apc.gov.uk. A summary of our conclusions and recommendations is reproduced at Annex E. At the end of 2005 the Home Office had not responded to our report.[17]

Suffering and Severity

54. Stemming from our work on statistics, we reported last year on our working group on Suffering and Severity. The membership of the working group is Professor Oliver (chair), Professor Holland, Dr Hubrecht, Mr Kemp and Mr Moore. Its terms of reference are to address the following topics:–

- the strengths and any weaknesses of the current system of severity limits and bands as a way of prospectively assessing suffering and severity. If significant weaknesses were perceived, what alternative system could be proposed; and

- How suffering and severity might be assessed retrospectively.[18]

55. In 2005 the working group noted that the Laboratory Animals Science Association (LASA) had proposed a pilot study of a retrospective system to measure substantial severity. This took forward work initiated by and reported on by the RSPCA and the Boyd group. We collaborated with this study; our Secretariat serviced the pilot study, and the Home Office funded a consultant to analyse the study and write the report.

[17] The Home Office replied commenting on our recommendations in February 2006.

[18] **Retrospective reporting** – the reporting of data already collected; a study of past events, in contrast to a *prospective study*, which attempts to predict what will happen in the future.

56. The LASA working group represented nine establishments drawn from industry/pharmaceutical organisations (3), large universities (3) and major government research institutes (3). The roles of project licence holder, personal licensee, Named Veterinary Surgeon and Home Office liaison officer were represented in the group. A member of the APC Working Group on Suffering and Severity and a Named Animal Care and Welfare Officer (NACWO) also participated. A Home Office inspector attended all meetings as an observer.

57. Working within the terms of reference provided by the APC, the LASA working group sought to devise a method of providing information about suffering and severity actually experienced by individual animals that could be published in an annual report and be used to refine future experiments. The process should have neutral or the least additional regulatory impact in terms of resource.

58. In order to engage more widely with project licence holders, a questionnaire was used to establish current practice in the nine establishments. Analysis of 168 responses showed that 9 out of 10 licence holders whose work involves moderate and/or substantial protocols always or sometimes made records of adverse effects actually experienced by the animals. The biggest difficulty they foresaw was the ability to record this information in a way that would facilitate annual Returns. Their major concern was the resource burden and its possible impact on time for welfare and science.

59. Drawing on the questionnaire findings, the experience of the LASA working group members and, examination of reporting models used in other countries (e.g. Switzerland), a range of initial options for reporting severity were identified and discussed. Alongside the identification of options, the LASA working group members brought to the discussions examples of protocols from their own establishments, demonstrating adverse effects from the procedure and/or its outcome. The protocols involved a variety of laboratory mammal species, including non-rodents; and had the potential to cause effects spanning severity categories mild, moderate and substantial.

60. The first option considered was reporting number of animals used by protocol severity limit, which was an improvement on the current publication of severity bands, but was not reflective of actual adverse effects. The LASA working group considered that this would greatly over-estimate actual severity and provide seriously misleading information.

61. Reporting using a single code (mild, moderate, substantial or unclassified) to indicate maximum actual severity was considered and found to be meaningful for simple protocols, but was not capable of adequately capturing the effects of more complex, longer-term procedures that generate more variable severity profiles over time. Combining intensity and duration into single severity codes, as in the Swiss system, would likely cause significant difficulties in interpreting the data reported. Increasing the number of categories, so as to avoid having to combine into a single code more substantial (but relatively short-term) effects and milder (but longer-term) effects, might be a possible solution.

62. In order to capture the overall experience of the animal for the duration of a procedure, an intensity-duration severity grid, in which the two parameters were considered independently, was developed. This grid worked well with procedures that had relatively simple severity profiles but again was less successful in providing a meaningful reflection of severity in more complex, longer-term procedures.

63. Reporting using two intensity-duration grids, to indicate (i) maximum severity and (ii) severity over the remainder of the procedure, had the potential to provide a representative picture of intensity and duration of severity over a wide range of different procedures. Early feedback from licence holders suggested that the system was understandable, intuitive to apply and workable in terms of its capacity to portray the severity of adverse effects in more complex procedures. The number of potential codes was significantly fewer than first envisaged and appropriate coding would frequently be predictable in advance, allowing exception reporting to be employed.

64. Options for returning the retrospective data (and resulting statistics) were identified, but no simple solution was identified. Providing these data as an additional report to the 'prospective' Returns would not allow cross-reference to other parts of the published *Statistics* and would constitute an additional burden on licence holders and establishments. An integrated process would be ideal, but would require substantial modification of the current Returns system so that all the data were compatible, and also simplification to make the process manageable and acceptable.

65. The LASA working group was clear that any scheme for retrospective reporting needed to be supported by detailed guidance, including a catalogue of worked examples covering the full range of species and a wide variety of regulated procedures. A glossary of severity codes for a range of protocols and outcomes, agreed by project licence holders, would be essential. Such guidance would also be valuable in explaining the data when they were presented in the public domain.

66. All LASA working group members considered the introduction of a retrospective severity assessment process to be beneficial, but were mindful of the additional bureaucratic burden that this would bring. The working group had collected estimates of resources required for the introduction of retrospective reporting of severity, and early indications were that for some establishments the burdens would be considerable. This would only be consistent with government policy on regulatory burden if matched by a similar reduction in other activities associated with the operation of the 1986 Act.

67. At our meeting in October 2005 the Suffering and Severity Working Group presented a draft report of the pilot study to the main Committee of the APC. Members of the Committee welcomed the pilot study report, which they saw as a very helpful attempt to make progress in a difficult subject area. Members who had had contact with organisations involved in the pilot study reported that the proposed two grid retrospective assessment system generally appeared feasible, and reported support for a wider pilot study in order to explore the proposed system further. Members also expressed concern that the introduction of such a system would lead to an increase in the regulatory burden, and emphasised the need to identify compensatory savings elsewhere in the regulatory system.

68. The Committee agreed three recommendations made in the covering paper. Those were:

- to accept the report of the pilot study as a promising first step towards the development of a practicable retrospective assessment system;

- to agree that the further work identified in the pilot study report should be taken forward expeditiously; and

- to request continuing Home Office support with specialist knowledge and material support; and parallel work in identifying bureaucratic savings.

69. The Home Office confirmed that continuing Inspectorate assistance to the wider pilot study could be provided, and any proposal for further consultancy work could be considered.[19]

The Committee's review of Schedule 1 of the Act

70. The humane killing of a protected animal is not a regulated procedure requiring authorisation by a project or personal licence, if it is undertaken at a designated place for a scientific purpose, and if it is performed by a method listed in Schedule 1 as appropriate to the type of animal. Since 2001 the Schedule 1 Working Group has been carrying out a review of Schedule 1 of the 1986 Act, which sets out the appropriate methods of humane killing for different animal species. In 2005 our Schedule 1 working group continued its work. Its membership comprised Dr Morris (Chair), Professor Broom, Mr Kemp and a co-opted member.

[19] A report of the initial APC/LASA pilot study can be seen on the APC website www.apc.gov.uk. The Home Office agreed to provide assistance and support for a consultancy, and the next stage of the pilot study commenced in March 2006.

71. The working group intended to complete its examination of these topics and present its final report to the main Committee in 2005. A report was presented at our December meeting covering the following proposed recommendations;

- Revision of the Format of Schedule 1 to improve presentation and allow flexibility to adjust to current good practices.

- Recognise that euthanasia[20] is a process, not a specific technique, and so allow use of premedicant agents and similar refinements.

- Extend Schedule 1 to include decapitation of non-precocial[21] rodents up to seven days old.

- Remove CO_2 as an acceptable Schedule 1 method for birds and include as Schedule 1 methods for birds:

    a) argon, nitrogen or other inert gases, or any mixture of these gases in atmospheric air with a maximum of 2% oxygen by volume; or

    b) any mixture of argon, nitrogen, or other inert gases with atmospheric air and CO_2 provided that the CO_2 concentration does not exceed 30% by volume and the oxygen concentration does not exceed 2% by volume.

- Provide advice on euthanasia of neonatal[22] rodents.

- Remove CO_2 as an acceptable Schedule 1 method for rabbits.

- Alter the maximum weight threshold for rats and guinea pigs at which the dislocation of the neck would be permissible to 500 grams for guinea pigs and 300 grams for other rodents.

- The Home Office should strongly encourage research into practical implementation methods for the use of inert gases or other techniques as a potential welfare improvement on the use of CO_2 for rodents. The Home Office and Animal Procedures Committee should closely monitor ongoing research into the use of CO_2 for rodents, with a view to deciding whether CO_2 should remain as an acceptable method of euthanasing rodents under Schedule 1, or if methods of administration of CO_2 need better definition.

- Euthanasia techniques for embryonated eggs[23] required further work. This is being undertaken by the European authorities and should take into account advice available to other Government departments.

- Euthanasia techniques for fish require further work. This should be included as part of consideration of any future APC work plan on fish.

72. At our meeting in December 2005 we identified an area of continuing uncertainty. This was in connection with the use of CO_2; there was still a great deal of scientific uncertainty over the use of CO_2 on rodents. This uncertainty would therefore not at present support any ban on the use of CO_2 on rodents. Experts in this field were due to meet on 27 and 28 February 2006 in order to discuss this very issue, so we agreed that the Working Group would reconvene after the meeting of experts in February 2006 and endeavour to bring a definitive and agreed report to the Committee's meeting on 21 June 2006.

[20] **Euthanasia** – the deliberate ending of life in a painless or minimally painful way. It is generally implied that the killing is done for the benefit of the individual animal.

[21] **Precocial** – being relatively mature and mobile from the moment of birth or hatching.

[22] **Neonatal** – relating to the period immediately after birth.

[23] **Embryonated egg** – an egg which contains an embryo.

Cephalopods[24]

73. Currently the 1986 Act defines a "protected animal" (ie, one to which the protection of the 1986 Act is extended) as any living vertebrate other than human, and one invertebrate species, the cephalopod *Octopus vulgaris*. In 2004 we had meetings with Home Office officials to explore the supporting evidence that might indicate if any further species of cephalopod should be given the protection of the 1986 Act. In the light of the discussion, the Chairman undertook to write again to the Minister with supplementary advice after further consultation with the full Committee. After further discussion at our meeting in February 2005, the Chairman wrote offering our advice to the Home Office.

74. During our discussions we had reviewed the scientific evidence that cephalopods can feel pain, suffering or distress, and we found this evidence compelling. We had learned, however, that in relation to certain cephalopod species there was a lack of firm scientific evidence, and that there were some grounds for believing that not all octopus, squid and cuttlefish have an equal sensory perception.

75. In view of this, the Committee discussed three options for taking forward its recommendations on Cephalopods, namely:

A) removal of *Octopus vulgaris* from the protection of the Act;

B) extension of the Act to a selective list of those cephalopods most likely to have the ability to feel pain, distress or lasting harm; or

C) extension of the Act to protect all octopus, squid and cuttlefish.

76. There was no support amongst members for option A. We noted that cephalopods lack homology of structure[25] with vertebrates, for example in terms of the brain structures thought to be involved in consciousness in vertebrates. However, as different structures could evolve to be used to achieve the same ends, it was suggested that this was insufficient reason not to give cephalopods the benefit of the doubt, and consider an extension of the protection of the Act to some more cephalopod species besides *Octopus vulgaris*. However, opinion in the Committee was divided between options B and C. Some members considered that the differentiation between coastal and deepwater cephalopods pre-supposed by option B was not a strong argument for excluding the latter group from protection. They pointed out that while there was no firm proof that the species to be excluded under option B were capable of experiencing pain and distress, the extension of the protection of the Act should not depend on firm proof of such a capacity. Taken to its logical conclusion, such an argument would indicate that the protection of the Act should be withdrawn from some vertebrate species for which there was no proof of sensory perception.

77. We considered that the merit of option B was that it was an attempt to draw a line on the basis of existing evidence and reasonable inferences. The merit of option C was that it was a pragmatic solution which would prevent the need to extend protection in a piecemeal fashion if and when new data became available.

78. We noted that the current revision of the EU Directive 86/609 would review the species to be protected by legislation. The Home Office told the Committee that the Commission was at that time minded to seek advice from the European Food Safety Authority (EFSA) on certain issues, including the possible inclusion of certain invertebrates, particularly cephalopods. We wrote to the Minister in April 2005, expressing the hope that our conclusions could be fed into the EU review process.

79. In his reply in July 2005 the Minister said that he was grateful to us for our consideration of this issue. He noted that we had concluded that there was compelling evidence that cephalopods can experience pain, suffering and distress and that there were scientific grounds for believing that not all octopus, squid and cuttlefish have an equal sensory perception. He also noted that opinion within the Committee was divided.

[24] **Cephalopods** – invertebrate animals comprising members of the class *Cephalopoda*, including nautilus, cuttlefish, squid and octopus.

[25] **Homology of structure** – a common ancestry between biological structures.

80. He said that Home Office officials shared the view that there is evidence that some cephalopod species have sophisticated nervous systems, complex behavioural repertoires, some cognitive capacity, and will avoid noxious or damaging stimuli. However, their analysis of the available evidence had highlighted that these features cannot automatically be assumed to indicate an ability to suffer. Many of the component parts could be identified in lower species, including insects. He said that if the Home Office were to accept our advice on the basis of the case currently presented, it would be illogical not to extend protection to other lower invertebrate species on the same grounds.

81. The Minister concluded by saying that he did not believe it would be right to further extend the protection of the 1986 Act at present as we had proposed. He suggested that the fact that the available evidence supported two different options suggested that the scientific case was not yet clear cut. He was minded to defer a final decision until the European Commission had completed its review of Directive 86/609/EEC. That review was also considering whether protection should be extended to cover invertebrate species. He said that he would copy our correspondence to the European Commission for information.

The "Cambridge/BUAV" Working Group

82. During 2005 a working group set up in 2003 comprising Professor Holland (chair), Professor Atterwill, Dr Hubrecht and Dr Jennings completed its work. The task it had been given by the Committee was to assess the allegations made in 2003 by the British Union for the Abolition of Vivisection (BUAV) about the use of marmosets[26] at Cambridge University, in the light of the ensuing report by the then Chief Inspector and the Home Office's response. The marmosets had been used in experiments involving operations on the brain in order to investigate Parkinson's disease. The working group's aim was to identify areas for discussion and possible further work by the APC.

83. The Working Group presented its final report at our meeting in April 2005. Although the report had not been produced in response to a specific request from the Home Office it was agreed that a copy should be sent to the Minister, commending the findings in the Report to the Minister's attention and identifying those aspects already under consideration by the APC or other bodies.

84. The Chairman sent the report to the Minister in June. The Chairman noted that unlike most thematic reports produced by the APC there were no firm recommendations that the Home Office was invited to consider. Rather, we sought to commend the report to the Minister, draw his attention to its conclusions and invite him to note areas of further work that the APC or other bodies might take further.

85. The full report can be seen on our website www.apc.gov.uk. Annex F is the Executive Summary of our report. In clarifying its terms of reference, the working group felt that its primary purpose in carrying out the work was a prospective one. That is, the identification of areas for discussion that the main APC might profitably take forward in furtherance of its statutory role of advising the Minister on the operation of the 1986 Act. Crucially, the members of the working group did not consider it appropriate or possible to conduct, or re-open an investigation, nor to offer adjudication between the BUAV's allegations and the Home Office's response. Rather they decided to examine the BUAV's report and the Chief Inspector's review, and on that basis draw conclusions regarding any lessons to be learned and to identify any issues that it would be feasible, fruitful and appropriate for the APC to take forward.

The APC's Cost/Benefit report: Home Office response

86. In our report for 2003 we reported sending our report on Cost/Benefit to the Home Office.[27] Recognising the great deal of work and thought that had gone into the production of the report, and that the report dealt with a complex and central part of the regulatory process the Minister had told us that she had asked officials to consider the report before giving a response.

[26] **Marmosets** – small clawed monkeys of the genera *Callithrix* and *Cebuella*, found in tropical forests of the Americas.

[27] Our Cost/Benefit report can be viewed on our website www.apc.gov.uk.

87. In March 2005 the Minister sent us her Ministerial response to the Cost/Benefit report. We discussed this response at our meeting in June, and sent our comments to the current Minister. Copies of both these letters are at Annex G. In our reply we recognised that it does not fall to the Home Office alone to make progress in relation to the various concerns which the Report raised, and we stressed two areas of particular significance.

88. First, we recognised, as the Government response highlighted, that there is much good practice in regard to Cost/Benefit assessment and that scientists are committed to reducing costs to animals. Our concern is that good practice should become common practice, and our consideration of project licence applications referred to the Committee indicates that there is still room for improvement.

89. Secondly, it is commonly – and we believe, properly – said that the use of animals in scientific experimentation is a regrettable necessity. It follows that there should be a determination to work imaginatively and constructively to bring about the end of animal use. Our interest in exploring with stakeholders the case for targets for an end to certain uses of animals arose from this perspective. We noted that in relation to the obviously quite different area of environmental pollution, it had been the case that demanding targets have been identified as providing a goal even where these targets might require technological and other innovation if they were to be met. There is a case to be explored for an analogous strategy in relation to animal use.

Infringements

90. The Home Office provides the Committee with an annual summary of infringements. These are breaches of the 1986 Act and of licence or certificate conditions, and are divided into three classes of seriousness, each of which merits different reporting and action systems. The Home Office also provides us with detailed individual reports of any infringement that impacts negatively on animal welfare, once Home Office action on the infringement has been completed.

91. In 2005 Committee members expressed concern about a serious infringement case about which we were informed, where a number of mice had inadvertently been left unattended for a period of over three weeks. The Home Office confirmed that it had taken legal advice on whether there were grounds for prosecution under the Protection of Animals Act 1911, and had been advised that there were not. Since the certificate of designation of the institution involved had been revoked as a consequence of the infringement, concern was expressed over the fate of the remaining animals. The Committee was informed that no animals had been euthanased as a consequence of revocation of the institution's Certificate of Designation, as all studies had been completed or the animals relocated beforehand.

92. In October the Home Office supplied us with a report of infringements on which action had been completed in 2004. We are grateful to the Home Office for sharing this information with us, as it enables the Committee to analyse the infringements and discuss any strategies for dealing with any problems. For example, one member was concerned that in previous years a number of infringements appeared to have occurred because of failures by members of staff to differentiate between a training certificate and a Home Office personal licence. We were told that although the problem was not apparent from the current report, this was a recurring problem that ought in theory to be easily preventable: that was why effective control by the Certificate Holder in an establishment was so important.

93. A previous annual Home Office report to the Committee about infringements had been published as part of the Committee's minutes. However, we recognized a concern that publishing all the material provided to the Committee could be in breach of data protection requirements, as the level of detail could result in individuals at an establishment, their infringements and the penalties awarded being identified by colleagues or others.

94. We appreciated these concerns about personal privacy, but also considered that the Committee had a legitimate concern that some information about infringements should be put into the public domain. We wish to demonstrate to the public that we react appropriately to infringements, and follow up particular issues. However, we concluded that the publication of this information might properly be a matter for the Home Office itself rather than the APC, and the Home Office agreed that it would be responsible in future for providing information about infringements in the Inspectorate's annual report. We agreed that the more comprehensive reports about infringements provided to us by the Home Office would not be published.

Batch testing of botulinum toxin[28]

95. Botulinum toxin is used as a prescription-only drug for medical purposes, such as correction of squints, control of facial spasms and improvement of a wide variety of disorders of movement or muscle co-ordination. However, a botulinum toxin product – "Botox Cosmetic" – is also widely used for reducing wrinkles. In our report for 2004, we described how we had sought assurances that there were no animal tests being carried out in the UK of botulinum toxin products manufactured specifically for "cosmetic" purposes. The Home Office gave us that assurance. However, we also learnt that European testing procedures required that batch testing of botulinum toxin for medical purposes still used a LD50 test.[29]

96. In 2005 we asked for further information about the phasing out of the LD50 test for routine batch testing of botulinum toxin in favour of a non-animal method or an animal test with a more humane end-point. The Home Office responded that local paralysis and *in vitro* protein tests had been developed, but that these had not yet been accepted as suitable to replace completely the LD50 test for quantifying the potency of this potentially lethal toxin.

97. We understood that a non-animal replacement assay had been internally validated at a particular UK laboratory, and we asked whether the same alternative had been introduced at the manufacturing stage. The Home Office told us that although an *in vitro* method was being used, this was only validated for the final confirmatory batch release tests at that particular laboratory. As it only assayed one aspect of the toxin's action it was not suitable on its own to replace the LD50 test for all potency testing of botulinum toxin. The European Pharmacopoeia[30] now in theory permitted various alternatives to the LD50 lethality tests which could be applicable during manufacturing and batch testing, provided these alternatives were validated. Validation needed to be done at the testing sites, and in the UK suitable arrangements to compare alternative methods against the current one were being progressed. However, greater reliability and wider acceptability were obtained if several sites participated in a validation; an international multi-site validation was being set up but it was proving to be a slow process. Ideally, formal validation would be conducted under the sponsorship and oversight of the relevant European bodies to take forward the widespread introduction of the alternative test and ensure mutual acceptability of data. Any study carried out entirely within the UK might have more limited applicability.

The Committee's work programme for 2005

98. We discussed the Committee's work programme for 2006 at our weekend conference in November 2005, and agreed it in early 2006. The work programme is at Annex I.

[28] **Botulinum Toxin** – the toxic compound produced by the bacterium *Clostridium botulinum* (commercially known as '*Botox*') that is used to relieve various medical conditions including painful spasticity.

[29] **LD50** "Lethal Dose 50" – is the statistically derived single dosage of a substance that can be expected to cause death in 50% of the animals. This test is being phased out in as many areas of toxicology as possible, in favour of alternative, less severe methods.

[30] **European Pharmacopoeia** – the European authoritative treatise on drugs and their preparations.

ANNEX A

Background information about the Committee

This annex sets out some basic information about what the Animal Procedures Committee is and what it does.

The legislation

The Committee was first appointed in 1987 and was set up by sections 19 and 20 of the Animals (Scientific Procedures) Act 1986 ("the Act"). The Act replaced the Cruelty to Animals Act 1876. The Act requires the licensing of any experiment or other scientific procedure carried out on living, protected animals which may cause them pain, suffering, distress or lasting harm. The Act regulates scientific procedures carried out on all vertebrate species except humankind – that is mammals, reptiles, birds, amphibians and fish – and one invertebrate species, *Octopus vulgaris*.

2. The Act also requires the licensing of places where certain species of animal are bred for use in regulated procedures. The species whose breeding is regulated in this way are all primates, dogs, cats, all of the most common types of rodent used in scientific procedures, rabbits, ferrets, quail, and sheep and pigs only if genetically modified.

3. The Act applies throughout the United Kingdom. For work taking place in England, Scotland and Wales the Home Office issues licences under the Act on behalf of the Home Secretary. In Northern Ireland, licences are issued by the Department of Health, Social Services and Public Safety. In each department there is an Inspectorate consisting of professional staff with medical or veterinary qualifications which examines and advises on all applications for authorities under the Act. The inspectors also inspect establishments and the licensed work being carried out there.

The Committee

4. The function of the Animal Procedures Committee is to provide the Home Secretary and the Northern Ireland Minister of Health, Social Services and Public Safety with independent advice about the Act and their functions under it. Those two Ministers are responsible for appointing members of the Committee. Members are experts from a wide variety of backgrounds, and the list at the beginning of this report sets out the membership as at the end of 2005. During 2005 Ministers appointed four new members: Dr John Doe, Mr Robert Kemp, Professor Keith Kendrick and Professor John Pickard. They were each appointed for a four year term of membership on 1 February 2005.

5. The Animals (Scientific Procedures) Act 1986 requires

- that there must be at least 12 people on the Committee (excluding the Chairman) and
- that: at least two-thirds of the members must have full registration as medical practitioners or veterinary surgeons, or be qualified in a biological subject relevant to the work of the Committee;
- at least one member must be a barrister, solicitor or advocate;
- at least half of the members must not have held a licence under the Act during the last six years; and
- the interests of animal welfare should be adequately represented (this has tended to mean, in practice, the appointment of members associated with animal welfare organisations, but all members pay high regard to animal welfare).

- There is normally a philosopher on the Committee, although this is not a statutory requirement.

6. Members are appointed for terms of up to 4 years and can be re-appointed once. The Act specifies that payments may be made to the Chairman by way of remuneration, and that other members can receive reimbursement for any expenses incurred by them in the performance of their duties. Apart from the Chairman, members are not paid for their work on the Committee, though they can claim reasonable out of pocket expenses. During the financial year 2005/2006, the Home Office had budgets of £10,000 and £27,500 respectively from which to make such payments.

7. Under section 20 of the 1986 Act, the Committee can devise its own agenda and can offer advice on any issue which it thinks relevant. But it must also deal with any question which Ministers refer to it.

8. Whatever issue the Committee is looking at, the law requires it to take account both of the legitimate requirements of science and industry and of the protection of animals against avoidable suffering and unnecessary use in scientific procedures.

Ministers

9. The Home Secretary in practice delegates his responsibilities under the Act to another Minister in the Home Office, which administers the Act in England, Scotland and Wales. At the beginning of 2005 that Minister was Caroline Flint MP, but she was replaced by Andy Burnham MP after the General Election in May. As stated above, in Northern Ireland the administration of the 1986 Act is the responsibility of the Department of Health, Social Services and Public Safety (DHSSPSNI). At the beginning of 2005 the responsible Minister in DHSSPSNI was Angela Smith MP, but she was replaced by Shaun Woodward MP after the General Election.

ANNEX B

The Animal Procedures Committee's Code of Conduct

1. The Animal Procedures Committee is an advisory Non-Departmental Public Body (NDPB) established under section 19 of the Animals (Scientific Procedures) Act 1986.

2. Members of the Committee are responsible for ensuring that the Committee fulfils its statutory duty as set out in section 20 of the 1986 Act

> "To advise the Secretary of State on such matters concerned with this Act and his functions under it as the Committee may determine or as may be referred to the Committee by the Secretary of State".

3. The 1986 Act adds that:

(i) in its consideration of any matter the Committee shall 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;

(ii) the Committee may perform any of its functions by means of sub-committees and may co-opt as members of any sub-committee any persons considered by the Committee to be able to assist that sub-committee in its work;

(iii) the Committee may promote research relevant to its functions and may obtain advice or assistance from other persons with knowledge or experience appearing to the Committee to be relevant to those functions;

(iv) the Committee shall in each year make a report on its activities to the Secretary of State who shall lay copies of the report before Parliament; and

(v) members of the Committee shall be appointed for such periods as the Secretary of State may determine but no such period shall exceed four years and no person shall be re-appointed more than once.

4. The Secretary of State for the Home Department (or, in Northern Ireland, the Minister of the Department of Health, Social Services and Public Safety) is answerable to Parliament for the performance of the Committee, including the policy framework within which it operates.

5. To ensure its accountability in carrying out its duties, the Committee will seek to work as openly as possible, complying with the Code of Practice on Access to Government Information.

6. Members are required to observe the Seven Principles of Public Life endorsed by the Nolan Committee on Standards in Public Life and to comply with this Code.

7. Each member must at all times act in good faith and observe the highest standards of impartiality, integrity and objectivity in relation to the conduct of the Committee's business. In particular, members should:

(i) familiarise themselves with the terms of reference of the Committee;

(ii) undergo any required induction training;

(iii) declare any personal or business interest which may, or may be perceived (by a reasonable member of the public), to influence their judgement. This should include, as a minimum, personal direct and

indirect pecuniary interests, and should normally also include such interests of close family members and of people living in the same household. A register of interests will be kept up-to-date and will be open to the public;

(iv) not participate in the discussion or determination of matters in which they have a personal or business interest, and should normally withdraw from the meeting (even if held in public) if their interest is direct and pecuniary;

(v) make a declaration of interest at any Committee meeting if it relates specifically to a particular issue under consideration, for recording in the minutes (whether or not a Committee member withdraws from the meeting);

(vi) not misuse information gained in the course of their public service for personal gain or for political purpose, nor seek to use the opportunity of public service to promote their private interests or those of connected persons, firms, businesses or other organisations;

(vii) not hold any paid, or high profile unpaid, posts in a political party, and not engage in specific party political activities on matters directly affecting the work of the Committee. When engaging in other political activities, members should be conscious of their public role and exercise proper discretion; and

(viii) understand and accept that they are appointed as individuals and not as representatives of organisations by which they are employed or with which they have significant contacts.

8. The Chair has particular responsibility for providing effective leadership to the Committee and for:

(i) ensuring that the Committee meets at appropriate intervals, and that the minutes of meetings and any reports to the Secretary of State accurately record the decisions taken, and where appropriate, the views of individual members;

(ii) representing the views of the Committee to Ministers;

(iii) representing, where appropriate, the views of the Committee to the general public;

(iv) ensuring that new members are briefed on appointment;

(v) sitting on the panel which advises Ministers on new appointments and re-appointments.

9. Notwithstanding 8(ii) above, any Committee member has the right of access to Ministers on any matter which he or she believes raises important issues relating to his or her duties as a Committee member. In such cases, the agreement of the rest of the Committee should normally be sought.

10. Committee members may be personally liable if, in the performance of their Committee duties, they make a fraudulent or negligent statement which results in a loss to a third party. They may also commit:

(i) an offence under section 24 of the Animals (Scientific Procedures) Act 1986;

(ii) a breach of confidence under common law; or

(iii) a criminal offence under insider dealing legislation

if they misuse information gained through their position on the Committee. Individual members who have acted honestly, reasonably, in good faith and without negligence will not, however, have to meet out of their own personal resources any personal civil liability which is incurred in execution or purported execution of their duties.

11. In accepting this Code of Conduct members accept that they will not disclose any information or documents if they are marked “Restricted” and not disclose any subsequent comments about material which has been marked “Restricted”. Members also undertake not to make copies of any such documents, and to follow the advice provided by the Chairman and Secretariat about the handling of such documents.

ANNEX C

Membership of sub-committees and working groups during 2005

The five sub-committees and four working groups that were in existence in 2005 and their memberships are listed below.

Research and Alternatives Sub-Committee
Professor D Clark (chair)
Dr Jennings
Dr Festing
Mr Moore

Education and Training Sub-Committee
Dr Jennings (chair)
Mr Kemp
Dr Festing
Mr Moore

Primates Sub-Committee
Professor McNeilly (chair)
Professor Atterwill
Dr Hubrecht
Dr Jennings
Dr Langley
Professor Pickard

Housing and Husbandry Sub-Committee
Dr Hubrecht (chair)
Professor Broom
Dr Jennings
Mr Kemp
Dr Morris

"Applications" Sub-Committee
Professor Banner (chair)
The other four members are taken alternately from each of the following four pairs of members:

Professor McNeilly	Or	Dr Hubrecht
Mr Moore	Or	Professor D Clark
Professor S Clark	Or	Professor Oliver
Dr Jennings	Or	Dr Langley

Schedule 1 Working Group
Dr Morris (chair)
Professor Broom
Mr Kemp
One other co-opted member

"Cambridge Primates – allegations by BUAV" Working Group

Professor Holland (chair)
Professor Atterwill
Dr Hubrecht
Dr Jennings

Statistics Working Group

Professor Bulfield (chair)
Dr Festing
Dr Langley
Mr Moore
Professor Oliver

Suffering and Severity Working Group

Professor Oliver (chair)
Professor Holland
Dr Hubrecht
Mr Kemp
Mr Moore

ANNEX D

Applications sub-committee: modus operandi

The Applications Sub-Committee will be ready to meet on the first Wednesday of March, May, August and November. Where necessary it will also be ready to meet on the same date as the full APC Committee meetings in February, April, June, September, October and December. It may also be specially convened at other times if necessary. The aim of the Sub-Committee will be to complete consideration of any issues that affect an application within 30 calendar days. This will partly depend on the Home Office at an early stage identifying cases to be referred to the Sub-Committee. The Sub-Committee expects to review around 8 cases per year.

2. The Sub-Committee will comment on the broader issues raised by applications and on specific details where appropriate. Where necessary it may seek to interview the licence applicant(s).

Involving the full APC in the decision making process of the Sub-Committee

3. When an application is received from the Home Office, it will be copied to all members of the APC, so that they will have an opportunity to pass on to the Sub-Committee any concerns or questions. The Sub-Committee will meet, and interview the applicant if necessary and formulate draft recommendations.

4. On occasions where the Sub-Committee is meeting on the same day as the full APC, those draft recommendations can be discussed by the main Committee.

5. On other occasions, the Sub-Committee's recommendations will be circulated to all APC members for comment. The Sub-Committee will consider whether to amend its recommendations in the light of those comments, and then forward its definitive advice to the Home Office. At the next meeting of the APC, the Sub-Committee's advice will be reported retrospectively, and it will be open to any APC member to raise any issue of concern.

Rolling membership

6. It is proposed that the APC Chairman should be an *ex officio* member of the Sub-Committee, and attend all meetings. But in order to reduce the burden on other members of the Sub-Committee, the other four members should be taken alternately from each of the following four pairs of members:

Professor McNeilly	Or	Dr Hubrecht
Mr Moore	Or	Professor D Clark
Professor S Clark	Or	Professor Oliver
Dr Jennings	Or	Dr Langley

7. The majority of those nominated retire from the Committee in 2006. There will therefore be a need to review the membership within a year. In addition, there is a commitment to the Minister to review the new arrangements for dealing with applications after two years.

ANNEX E

ANIMAL PROCEDURES COMMITTEE: STATISTICS REPORT: SUMMARY AND RECOMMENDATIONS

June 2005

12.1 Introduction

12.1.1 Background

In July 2002, the House of Lords Select Committee on Animals in Scientific Procedures reported, and the Government published its response in January 2003. Recommendation 30 of the House of Lords report was that, "A formal consultation on the Statistics should be carried out with a view to making them easier to interpret". The Government response was that, "The Statistics of Scientific Procedures using Living Animals provide a wealth of detailed information. However the Government is conscious that they are not presented in a readily digestible form. We will review, in consultation with stakeholders, how they might be improved". On 5 June 2003, the then Home Office Minister Bob Ainsworth wrote to the APC Chairman, asking the APC to carry out a thorough review of the annual *Statistics of Scientific Procedures on Living Animals in Great Britain*.

We have presented the findings of that review in this report, and here we summarise our conclusions and recommendations. We hope that, in considering the following recommendations, readers will refer to the detailed discussions in the relevant chapters of this report. To assist in this, the second digits in paragraph numbers below refer to the associated chapter numbers (e.g. 12.2.1 refers to Chapter 2).

12.1.2 The *Statistics* publication

Section 21(7) of the Animals (Scientific Procedures) Act requires that the Secretary of State shall in each year publish and lay before Parliament such information as he considers appropriate with respect to the use of protected animals in the previous year for experimental or other scientific purposes. Licence holders are required, as a condition of their licences, to submit a Return of scientific procedures. These Returns are collated and the annual *Statistics* for Great Britain are produced from them. A separate but similar publication is produced for Northern Ireland. The Minister's letter that commissioned our work to carry out a thorough review of the annual *Statistics of Scientific Procedures on Living Animals in Great Britain* said that the similar Northern Ireland statistics were not to be the subject of our investigations. However, the Act applies to the whole of the United Kingdom.

Recommendation 1:

Whilst it has been the practice for the statistics for Northern Ireland to be produced separately, the Act does not expressly require this. Even though a much larger number of procedures is carried out in Scotland, they are not recorded separately. One UK publication would assist clarity as well as saving some administrative costs. We therefore recommend that the Home Office and the Department of Health and Social Services and Public Safety for Northern Ireland should consider amalgamating their statistics publications.

12.1.3 RDSD's database of annual Returns from project licence holders

Collation of data from the annual Returns and subsequent publication of the *Statistics* are the responsibility of the Research Development and Statistics Directorate (RDSD) of the Home Office's Science and Research Group.

Recommendation 2:

We are conscious that it may be difficult to change the RDSD database software. However, within this constraint, we recommend that the Home Office actively seek to anonymise and publish the database of Returns in a fully searchable and relational form, and, if possible, to permit comparison of different years' *Statistics*. This would allow individuals to interrogate the information contained in the database for themselves.

12.1.4 Additional information contained in project licence abstracts

At the time of writing, the Home Office, as part of its Publication Scheme to comply with the Freedom of Information Act 2000, has started to make abstracts of project licences, prepared by project licence holders, available on its web-site. Already, it is clear that these abstracts will contain a wealth of descriptive information that could be used to provide illustrations of the types of work that, later, come to be reported under the various headings in the *Statistics*.

Recommendation 3:

Our view is that licence abstracts should be made searchable according to key words that bear relationship to the headings in the *Statistics*. The practicality of this suggestion should be considered by the Home Office as more abstracts become available.

12.2 Objectives of the *Statistics*

12.2.1 Recommendations

Recommendation 4:

The *Statistics* should aim:

i. overall, to promote informed debate and enhance transparency about the use of animals in scientific procedures by the appropriate collection, analysis and presentation of data to Parliament, the public, Government Ministers and Departments and other interested parties; and, as part of this,

ii. to assist readers' understanding of why and how animals are used under the Animals (Scientific Procedures) Act 1986 and to help to inform public debate on harm-benefit assessment under the Act – this will include providing data that can assist in answering Parliamentary Questions;

iii. to discern historical trends in the use of animals under the Act;

iv. to allow monitoring of the effects of changes of policy on animal use under the Act;

v. to help in monitoring areas in which work on the Three Rs is being most effective; and

vi. to provide information on the licensing process itself.

Recommendation 5:

Additionally, the process of collating such statistical data, through completion of the Returns, can enable project licence holders and establishments critically to review their use of animals. Individual establishments should collate data on animal use returned from individual project licensees and provide the resulting summary information to their ERPs, so that the Returns can be used as an opportunity to consider trends in animal use within establishments, and so target local efforts to implement the Three Rs.

Recommendation 6:

The objectives of the *Statistics* should be stated in the publication itself; and the definition of the term 'procedure' in this context should be clarified.

Recommendation 7:

With regard to the objective of "discerning historical trends in animal use", the Minister should bear in mind that any changes to the *Statistics* should, as far as possible, ensure compatibility with historical tables in the publication.

Recommendation 8:

With regard to the objective of "monitoring of the effects of changes of policy on animal use under the Act", it is valuable to report on uses of animals that have been disallowed under administrative provisions subsequent to

the inception of the Act, in order to help inform readers of current limits imposed on animal use. However, rather than presenting information on such restricted uses as blank rows in the relevant Tables (as is current practice), there should be footnotes stating that no animals were used, because the particular use is no longer permitted. This would indicate the current situation more clearly than a blank row, which could be open to misinterpretation.

12.2.2 Other points

(a) With regard to the objective of "providing information on the licensing process", we note that relevant information is already published in the Home Office Annual Report and summarised in the *Statistics*.

(b) We also debated the advantages and disadvantages of responding to an additional objective, that the *Statistics* should include data on *in vitro* and *ex vivo* animal use. Our discussions are summarised in Chapter 8, and our conclusions are re-iterated in paragraph 12.8 below.

(c) It is clear that it is impossible fully to achieve the objectives listed in Recommendation 4 using mainly (or exclusively) numerical data. Nevertheless, given this proviso, it is our view that the current publication already goes a considerable way towards achieving the ends set out above, and our further recommendations should be viewed in this light.

12.3 Species and other information about types of animals

12.3.1 Recommendations

Recommendation 9:

Information presented in the *Statistics* on the species and types of animals used under A(SP)A should be enhanced in the following ways (see Chapter 3 for more detailed discussion of the reasoning behind these conclusions):

i. **Non-human primates** – The *Statistics* should identify all non-human primates to species level.

ii. **Endangered species** – The *Statistics* should record numbers of animals for each CITES-listed endangered species used.

iii. **Wild animals** – The use of wild animals should be identified and counted in the *Statistics*, in order to monitor trends in use. There should also be a distinction, by genus, between wild animals used in their natural environment and animals that are wild-caught (whether in Britain or abroad) but used in the laboratory. This would require a new question in the Returns form. We note that importation of wild-caught primates for use in research and testing requires specific and exceptional authorisation by the Home Office, and that data on numbers of such animals used are already available. These figures should be published. Data on the use of wild and wild-caught animals should be presented in the published *Statistics* in the form of a table showing species used against broad categories of purpose, with any more detailed information, relating for example to purpose, legislative reason for use or severity, made available in the full web-based version (see paragraph 12.11 below for further discussion).

iv. The main groups should also be identified for large numbers of other animals which presently have little or no information. This includes birds, fish, reptiles and amphibians. Data on 'species used' should be collected for all four groups. We suggest that these data be presented according to the following categories, which should be reviewed on a regular basis and, if necessary, amended in light of changing patterns of use (bearing in mind the need to maintain historical trend analysis):

- **Birds** – The numbers of the main species and genera included in "other birds" should be enumerated separately, probably as pigeons, ducks, zebra finches, starlings, tits and corvids, retaining a (smaller) "other birds" category. Table 2, which deals with Schedule 2 animals, should continue to list only *C. coturnix*, but in all other Tables quail species should be merged to yield one figure.

- **Fish** – Information should be provided on the use of zebra fish, salmon and trout (being the main farmed fish used), and the main species used in ecotoxicity testing, with the remaining fish in an "other fish" category.

- **Reptiles** – This category could usefully be sub-divided into lizards and snakes (being the main groups used), and "others".

- **Amphibians** – Figures should be broken down into "*Xenopus* species"; "other frogs"; "toads"; "axolotls" and "other amphibians".

- **"Other mammals" categories** – The species/genus information that is already collected for the categories "other rodents", "other carnivores", "other ungulates", and "other mammals" should be made publicly available.

- **Camelids** – This category could be discontinued, since very few/nil are used.

- **Dogs** – These could be represented as "beagles" and "other including cross-bred dogs", since there seems to be no further value in separating greyhounds as a breed.

- **Great Apes** – Despite the current administrative prohibition on the use of these species, the Returns codes for gibbons and Great Apes should be retained and explanatory footnotes added to the relevant species Tables (see Recommendation 8 above).

- **Cephalopods** – If the Minister accepts the APC's recommendation to extend the protection of the Act to cephalopods other than *Octopus vulgaris*, the numbers in each broad cephalopod grouping (e.g. octopi, cuttlefish etc.) should be published.

12.3.2 Further comments

(a) The proposed changes detailed above are based on responses to our Consultation and are suggested with the aims of:

- enhancing transparency, especially with regard to welfare implications of using different species and types of animals;

- assisting in monitoring changes in animal use;

- identifying needs for guidance on best practice in animal care and use; and

- helping to prioritise strategies for funding work on the Three Rs.

(b) The proposals apply to all relevant current Tables. To avoid over-complicating and/or over-lengthening the printed summary of the *Statistics*, some of the further species/genus information suggested here would be reported only in the full version of the *Statistics* available on the web (and printed for Parliament – see paragraph 12.11 below).

12.4 Sources of animals

Recommendation 10:

Tables dealing with the source of animals should refer to "animals", not "scientific procedures."

Recommendation 11:

The Home Office should require reporting of the true "origin" of animals (defined as their place of birth) when this differs from their proximate "source". This would help in providing more meaningful information on some of the welfare costs involved in the supply of animals, which at present are difficult to discern, because "source" refers to the immediate place from which an animal has been obtained and can therefore mask journeys from the animal's place of birth to a supplying establishment. The change would mean that suppliers would have to

specify the place of birth of any animals not bred by them. Since a similar problem of definition applies to the EU statistics, the Home Office should also inform the EC of this change and the reasons for it.

Recommendation 12:

"Origin" (where this differs from source) should be divided into the same categories as those for sources of Schedule 2 animals. In addition, the proximate sources and origins (where these differ from source) of *non-Schedule* 2 animals should be returned and reported similarly.

12.5 Genetic status of animals

12.5.1 Recommendations regarding clarity of presentation

Recommendation 13:

For the summary version of the *Statistics* (see paragraph 12.11 below) it is absolutely essential that the data in the Tables on the genetic status of animals are abstracted into clear summaries and presented in a form easily understood by the lay reader. The more detailed version of the *Statistics* (see paragraph 12.11) should contain the full Tables, integrated into clear explanatory text, with all further necessary background in footnotes or in 'boxes' adjacent to the Tables, so that they are totally self sufficient in their understanding.

Recommendation 14:

A section in the *Statistics* is required explaining clearly the procedures used to produce, identify, and maintain mutant animals (including ENU mutagenesis) and the procedures and types of animals involved (including embryo donors, surrogate mothers, use of stem cells for knock-outs, founder animals, and chimaeras) to produce and maintain GM animals. This will help to clarify the data in Tables 3.1, 3.2 and 3.3.

Recommendation 15:

For clarity:

(i) procedures involving artificially-induced mutant animals should be separated from those involving genetically modified animals;[1] and

(ii) the headings in the last three columns (before totals) in Tables 3.2 and 3.3 should be changed to:

- use in fundamental or applied studies other than toxicology (the column is actually headed "use in further regulated procedures");
- use in production of biological materials or other similar procedures;
- use in toxicology or other safety evaluation.

12.5.2 Recommendation on reporting artificially-induced mutant and GM animals bred but not otherwise used in regulated procedures

For more detailed discussion on the following recommendation, please refer to paragraph 5.2.2 (*et seq.*) of our report.

Recommendation 16:

At the very least, there is a need for clarification of the animal welfare implications of data reported in the *Statistics* for artificially-induced mutant and genetically modified animals that show no apparent adverse effects and are bred but not otherwise used in regulated procedures. In this regard, we recommend that the Home Office review its method of counting and presenting data on GM and mutagenised lines, and, in particular, give further consideration to the following possible strategies:

[1] Artificially-induced mutant mice have genetic changes that result from chemical or other interference with their genes. Genetic modification is achieved by transferring genetic material (DNA) itself from one individual to another, which may be of different species (e.g. human DNA into mice).

(1) To continue to count, report in the *Statistics* and include in the annual totals, all GM and artificially-induced mutant animals bred but not otherwise used, but to distinguish between those which suffer adverse effects and those which suffer no obvious adverse effects.

Note that this strategy, and (2) below, would require an agreed means of assessing the adverse effects experienced by the different genetically altered lines of animals – see paragraph 5.2.8 in our report.

(2) To count and report these animals in the Statistics as above, but exclude from the annual totals those which appear to suffer no adverse effects, so as to provide transparency whilst at the same time meeting concerns about inflating the annual figures;

(3) To treat artificially-induced mutant and GM animals in the same way as spontaneous mutants, and therefore to exclude from the Statistics entirely those bred but not otherwise used and which appear to suffer no adverse effects. This would require that these animals (like spontaneous mutants showing no adverse effects) be released from the Act, unless or until they were used in a regulated procedure, and so would require a change in Home Office policy.

Note: All members of our Working Group would accept the second strategy, though some would prefer these data to be included in the annual totals (as in the first strategy) and others would prefer the third strategy.

12.5.3 Recommendation on presentation of data on cloned animals

Recommendation 17:

Although only a small number of animals are likely to be involved at present, we recommend that the Home Office consider enumerating the production and use of cloned animals separately.

12.6 Capturing data on animal suffering and progress with the Three Rs

12.6.1 General comment

Several of the objectives outlined in 12.2 above, particularly those of informing public debate on harm-benefit assessment and assisting in planning work on the Three Rs, require additional information relating to the severity of animal procedures. However, at present, the *Statistics* publication includes very little information directly relevant to the harms caused to animals in scientific procedures, nor, even, what kinds of procedures are carried out.

12.6.2 Retrospective reporting of data on severity

Questions relating to retrospective reporting of the severity of animal procedures are now under consideration by a separate APC Working Group on Suffering and Severity (chaired by Professor Dawn Oliver). This issue is also related to the method of counting animals for statistical purposes – see paragraph 12.10.

12.6.3 Recommendations on other information relevant to severity and the Three Rs

Recommendation 18:

Table 9 of the *Statistics, Techniques of particular interest*, gives some, albeit limited, information about particular procedures. However, although potentially useful, the data collected and reported under this heading could be made more pertinent and relevant to severity. The techniques listed in Table 9 should be reviewed and changed as necessary so that they better represent procedures in current use that may cause substantial suffering. In future, there should be periodic reviews of the headings in this Table, and changes made to ensure that the techniques covered are the most appropriate (bearing in mind historical trend analysis).

Recommendation 19:

It should be ensured that areas that seem ripe for replacement and areas in which there appears to be growth in the number of animal procedures are enumerated separately in the *Statistics*. Appropriate categories might be decided in dialogue with the NC3Rs.

Recommendation 20:

An Appendix illustrating examples of applications of the Three Rs was included in the *Statistics* for 1998 (Appendix C, pages 97-99 in Home Office 1999) and subsequently made available on the Home Office website. This should be re-introduced.

Recommendation 21:

In due course, consideration should also be given to the inclusion of a summary report on the work of the NC3Rs, in order to highlight any recent advances in the Three Rs and, wherever feasible, correlate these with published statistical data.

12.7 Anaesthesia and analgesia

Recommendation 22:

With respect to use of anaesthesia and analgesia, the annual Returns and *Statistics* publication should classify regulated procedures as follows:

1. those performed entirely under general anaesthesia, from which the animal does not recover consciousness (i.e. those in which the animal is 'terminally anaesthetised');

2. those in which the animal may experience little or no pain or discomfort, which would be equal to or exceeded by the stress of administering an anaesthetic and/or analgesic (excluding those in which the animal is terminally anaesthetised);

3. those in which the animal may experience pain or discomfort exceeding that in (2) but which will be alleviated by use of anaesthesia and/or analgesics (excluding those in which the animal is terminally anaesthetised); and

4. those in which the animal may experience pain or discomfort which, for experimental reasons, cannot be alleviated by use of anaesthesia and/or analgesics.

12.8 Data on animals not used in regulated procedures

The pros and cons of including in the *Statistics* data on animals bred in designated establishments but not used in regulated scientific procedures, on animals killed by Schedule 1 methods to supply tissue for *in vitro* use, and on other non-regulated scientific uses of animals are outlined in Chapter 8 of our report.

12.8.1 Data on animals bred for regulated purposes and not used

There remains a divergence of opinion within our Working Group on the question of whether there should be a requirement for formal recording and reporting in the *Statistics* of these data. Those who argue in favour of including such information suggest that numbers of these animals could be Returned and published in the *Statistics*, but excluded from the overall total, so as to provide transparency whilst avoiding 'inflation' of the figures. Other members concur with the view of a previous APC Working Group on Overbreeeding, that formal reporting of these data is not necessary at this time.

Recommendation 23:

The question of whether or not animals bred for regulated purposes and not used should be counted and reported in the *Statistics* should be kept under review. We further recommend that Ethical Review Processes (ERPs) in designated establishments maintain awareness of the issues, monitor production strategies and work to ensure that surpluses are minimised.

12.8.2 Data on animals killed for tissue for in vitro use

Again, the Working Group is divided on whether or not these data, which are already recorded within designated establishments, should be reported in the *Statistics*. Those who argue in favour suggest here, too, that numbers could be returned and reported in the *Statistics*, but excluded from the overall total.

Recommendation 24:

Reporting requirements in this area should be kept under review. We further recommend that, within each designated establishment, numbers of animals killed by Schedule 1 techniques to provide tissue for *in vitro* use (which are already recorded) are reported to the establishment's ERP, so that they can be reviewed annually – in order, for example, to implement and monitor the effectiveness of strategies to ensure that when animals are killed, as many as possible of the organs and tissues that become available are actually used.

12.8.3 Data on other non-regulated scientific uses of animals

Non-regulated procedures may be carried out at non-designated as well as designated establishments and are, by definition, outside the Act. Most members of the Working Group do not consider it realistic to seek to obtain this information. However, it is also argued strongly within the Group that, in order to improve transparency on the full extent to which animals are used for scientific purposes, these data should be collected from designated establishments and published in the *Statistics*, with a footnote to explain that the numbers are not totally comprehensive.

12.9 Data on primary purpose and target body system

Recommendation 25:

The Home Office should review the categories included under these headings for current relevance and pertinence. We make the following suggestions, based on responses to our Consultation and discussions within the Working Group:

12.9.1 Recommendations on classification of toxicological purpose

Recommendation 26:

The categories in Tables 10 and 10a should be reviewed, and this should include consideration of the following points:

- under the *General safety/efficacy evaluation* column, *Finished cosmetics* and *Cosmetic ingredients* could now be deleted (retaining the information as footnotes – see Recommendation 8); and *Food additives* and *Other foodstuffs* should be merged into a single heading (possibly 'novel ingredients and food');

- under *Other purposes*, the *Tobacco Safety* column could also be deleted (again, retaining the information as footnotes – see Recommendation 8);

- *Pharmaceutical safety/efficacy evaluation* should be re-classified – for example, it could be divided into three categories: 'chemical materials', 'vaccines' and 'other biological substances'; and 'vaccines' could be further divided into 'developmental' or 'batch' testing. We note, however, that, as the Table is currently formatted, this would involve considerable additional complexity.

Recommendation 27:

The categories recording tests to satisfy UK and other legislative requirements (Table 11) should be made more specific. (In this context, we note that the number of different categories will likely be reduced with continued EU harmonisation of legislation – e.g. the category for procedures performed to meet national legislation specific to *One EU country only (not UK)* should eventually be unnecessary).

Recommendation 28:

Table 12 sub-divides toxicological procedures into 20 types of test. The classification is in accordance with OECD guidelines and the Table or accompanying commentary should clarify this point.

12.9.2 Recommendations on classification of non-toxicological purpose

Recommendation 29:

The disciplines listed in Table 5 reflect a classification that may not be currently relevant and, moreover, appears to combine field of research with end-use. We recommend changing the headings in this Table to reflect current

descriptions of disciplines e.g. to remove *Anatomy* and to include the headings *Developmental biology* and *Cell biology*. *Cancer research* would perhaps fit more appropriately in a classification by reference to disease or condition (whether as purpose or end-use – see Recommendation 30 below). The heading *Tobacco* is no longer relevant and should be removed (retaining an explanatory footnote – see Recommendation 8).

Recommendation 30:

It is clear that, where the purpose of a procedure is other than toxicological, to describe its purpose by reference to primary target body system (Table 4a) and field of research (Table 5), gives little if any information about the application and end-use of such research. For this reason, we recommend a revision of Table 4a that would enable licensees to indicate whether the programme of work in the project licence is specifically directed against a disease or condition. Information would be captured by extending the list of systems currently in Table 4a (so none of the information currently obtained is lost); retaining the *Other, Multiple systems* and *System not relevant* categories and including a column asking: *Is the work directed against a disease/disorder?* Examples of possible headings are listed below.

Examples of possible headings to extend Table 4a

Note that these headings do not represent how the table would look and consideration would need to be given to the appropriate format e.g. whether each system column should be sub-divided according to whether the work is directed against a disease/disorder or not.

Human systems	Cancer research Cardiovascular Ear, nose and throat Endocrine and metabolic Genetics Gynaecology and Obstetrics Haematology Hepatic Immunological Infection Mental health Musculoskeletal/connective tissue Neurological Nutritional/gastro-intestinal Ophthalmological Pain research Renal and urological Respiratory Skin
Animal systems[2]	Infection Other
Other systems	
Multiple systems	
Is the work directed against a disease/disorder?	

[2] It is possible that the range of system options for animals could be extended, to mirror those for humans.

12.9.3 Further comments

(a) ***Techniques of particular interest***

The headings in Table 9, on *Techniques of particular interest*, should be reviewed – see Recommendation 18.

(b) ***Classification of toxicological cf. non-toxicological purpose***

Research involving non-toxicology work accounted for over 83% of the total procedures in 2003, yet for those protocols that are not for the production of biological materials (Table 8) or for breeding (Tables 3.1-3.3) and do not include specific techniques of particular interest, there is no further information about purpose beyond general 'field of research'. (There is, of course, information provided about purpose, source, genetic status, target body system and the use of anaesthesia, but these data are required for animals used for toxicology as well.) The system of classification appears to provide much more information about the 16% of procedures that fall under the toxicology umbrella. This further supports the proposed addition of the end-use table (see Recommendation 30).

12.10 Reviewing methods of counting animals and procedures

12.10.1 The present method of counting animals and procedures (in which each is counted once, at the start of the procedure) leads to a number of difficulties, including the following:

1. In any given year, it is impossible to discern the total numbers of animals being used and procedures actually underway, and there is no indication of how many uses last longer than 12 months. Thus it can be argued that the content of the *Statistics* does not match the full title of the publication.

2. Counting animals only once at the start of a complex or lengthy reported procedure may provide an incomplete picture of the full use ultimately made of the animals. This leads to internal inconsistencies in the *Statistics*, such as omissions in the *Statistics* of the use of anaesthesia and of techniques of particular interest.

3. The present method of counting, being 'prospective' (i.e. counting animals and procedures when they begin) does not lend itself to a system of reporting the severity of adverse effects *actually experienced* by animals when they are used in scientific procedures. This would require a retrospective system of reporting (i.e. counting animals at the conclusion of the procedures).

4. In the case of re-use, the present system of counting animals and procedures can cause internal inconsistencies in the *Statistics* and consequent misunderstandings.

12.10.2 *Recommendation 31:*

In order to address difficulties arising from the present system of counting animals and procedures, we recommend that the Home Office give serious and detailed consideration to changing the method of counting employed in the current annual Returns and in the *Statistics* publication. This should include consideration of:

(a) the possibility that numbers of *animals* only, and not procedures, could be reported and published – along with separate re-use data; and

(b) the possibility of adopting a system involving *either*:

(i) *modified prospective counting*: in which each animal is counted in every year it starts on a procedure and in every year in which that procedure continues; *or*

(ii) *retrospective counting plus duration codes*: in which each animal is counted when its use in a regulated procedure is completed and a new code is added, to record the duration of each procedure.

The advantages and disadvantages of these two systems are summarised overleaf.

Advantages and disadvantages of three different methods of counting

CHARACTERISTIC	METHOD OF COUNTING		
	Current: prospective	**Modified prospective**	**Retrospective + duration codes**
Information on numbers of animals *in use* in any given year	Incomplete: counts animals (and procedures) *only* in year *started*.	Complete: counts animals first used in the given year; and also uses started in the previous year(s) continuing in the given year.	Incomplete in any given year: because animals are only counted at the conclusion of procedures which may have started in a previous year. However: complete data can be discerned retrospectively, from data on duration of procedures.
Information on duration of procedures	Provides no information on duration. Can mask techniques of concern which are carried out in subsequent year(s), after a procedure is first started. Does not capture data on long-term procedures lasting more than a year.	Provides information on animal use lasting longer than a year, and makes explicit 'returnable' techniques used in any subsequent year(s) after the procedure is first started. Does not capture data on long-term procedures started and finished within a year; nor distinguish shorter-term procedures crossing the year-end.	Provides complete information on duration by means of specific duration codes.
Possible link with data on *actual* severity of animal procedures	Not possible, because counting is prospective not retrospective.	Not possible, because counting is prospective not retrospective.	Possible, because counting is retrospective. Also records duration of procedure – an important part of severity assessment.
Effects on historical compatibility of data	Present system: no change.	Historical trends would be maintained, because animals first used in any given year would be reported separately, as in the present system.	Historical trends would not be maintained initially – but there could be dual recording for the first year (prospective and retrospective) thereafter numbers should increasingly become comparable with previous years.

12.11 Presentation of the *Statistics*

Recommendation 32:

The *Statistics* should be made available in two versions, a full report and a summary, entitled respectively:[3]

Full report: *Scientific Procedures on Living Animals. Great Britain [date]: Statistics and Other Information*. This would be aimed at those seeking full information about animal procedures; and

Summary: *Scientific Procedures on Living Animals. Great Britain [date]: Main Points*. This version would be aimed at the general reader who seeks only basic information.

Recommendation 33:

Both the Full report and the Summary should be placed on the Home Office website in formats that allow the documents to be searched, with links enabling readers to move between sections of the two reports with ease. The Summary should also be printed in glossy format, for wide circulation, while the Full report should be printed for Parliament, but otherwise made available only on the web.

Recommendation 34:

The presentation of both publications should be redesigned to make them more user-friendly. In particular:

- the explanatory text and data should be integrated, so that they form a unified, continuous narrative;
- pictorial representations of data, such as charts, graphs and histograms, and colour should be used wherever possible;
- it should be ensured that each Table or Figure contains, or is adjacent to, all the information the reader needs to understand it – this could involve the use of footnotes, but should avoid the need to cross-reference other parts of the report; and
- in the web versions, there should be hyperlinks within the documents, to published project licence abstracts and related material.

Finally, in relation to presentation, we have already recommended that the RDSD database of annual Returns should also be made available as anonymised raw data in fully searchable and relational form, in order to permit individuals to interrogate the information and hence construct their own Tables (Recommendation 2).

[3] Note that, if Recommendation 1 were accepted, the titles of the publications would need amending to reflect the inclusion of Northern Ireland statistics.

ANNEX F

EXECUTIVE SUMMARY OF THE CAMBRIDGE/BUAV REPORT

Under the heading of 'process and procedure' we make the following three proposals:

1. That the APC should confine its attention to the prospective consideration of strategic issues, and not be drawn into retrospective judgements (13-16)

2. That the APC, in its advisory capacity, should actively explore the feasibility of instituting some form, or forms, of complaints procedure (10-12, 17)

3. That the APC, in furtherance of its advisory capacity, should consider the feasibility of regularising meetings of a bilateral nature with the key players involved in animal research, with the aim of keeping strategic issues under review (18).

Under 'issues of substance', we make one proposal:

4. That the APC, possibly through its sub-committee on primate research, should consider initiating a case study of a key area of medical research such as Parkinson's Disease with a view to facilitating an overall strategic assessment of the role of animal research within the broader endeavour to alleviate human, and animal, suffering (26-27).

We also identify the following areas as fit subjects for further scrutiny:

5. staffing issues: levels, training and competency (20-21)

6. standards: the roles and responsibilities of the various bodies involved, for setting, reviewing and maintaining standards of animal welfare, and initiating improvements (23-25)

7. the publicity issued by funding bodies and medical charities regarding the benefits of the research that they fund and, especially, the costs to the animals (28)

8. a re-working of the labels used to indicate the severity of animal suffering so as to build a more detailed picture, and more generally agreed understanding, of what animal research involves (30-32)

9. the sources of disagreement about the nature and degree of severity of suffering (33-34)

10. the implications of food and water deprivation and deferral (35)

11. the detection of suffering: what levels of detection should be in place in order to satisfy the requirements of the Act? (36-37).

ANNEX G

COST/BENEFIT: LETTER FROM CAROLINE FLINT MP OF 28 MARCH 2005 AND LETTER FROM MICHAEL BANNER OF 12 JULY 2005

Reverend Professor Michael Banner, MA, Dphil,
Chairman of the Animal Procedures Committee,
C/o APC Secretariat,
5th Floor, Allington Towers,
LONDON SWIE 5EB

28 March 2005

Dear Michael

Report by the Animal Procedures Committee – Review of Cost Benefit Assessment in the use of Animals in Research: Ministerial Response

In 2003 your Committee published the report entitled Review of Cost Benefit Assessments in the Use of Animals in Research. I am sorry that other pressures on Home Office officials have delayed a Government response, though I know you have been kept informed of the situation. I am grateful for the Committee's forbearance.

The Appendix to this letter is my self-explanatory response to the main issues and recommendations, given for ease of reference as comments under the main headings in Chapter 6 of the report.

I wish to record my appreciation of the considerable amount of work that you and everyone concerned have put into this. The report does justice to a critically important part of the regulatory regime provided by the Animals (Scientific Procedures) Act 1986. There is much in it with which the Government agrees, and we commend it for serious consideration by all who have responsibilities as regards the use of live animals in science.

Yours

CAROLINE FLINT

Appendix to Caroline Flint's letter of 28 March 2005

Report by the Animal Procedures Committee (APC) – Review of the Cost-Benefit Assessment in the use of Animals in Research

Government Response by Caroline Flint MP, Parliamentary Under-Secretary of State for the Home Department

Introduction

A licence to carry out scientific procedures using animals can only be granted under the Animals (Scientific Procedures) Act 1986 (referred to hereafter as the 1986 Act) once a number of conditions have been met. One of these – in accordance with section 5(4) of the Act – is that the likely adverse effects on the animals concerned must be weighed against the benefits expected to accrue from the proposed programme of work.

This is generally referred to as the cost benefit assessment. In practice it means animal use will not be allowed unless Home Office officials, taking decisions on behalf of the Secretary of State (direct Ministerial involvement in licensing decisions is rare), deem it to be justified by the expected scientific results. That decision in each case is informed by expert advice from the Animals (Scientific Procedures) Inspectorate (referred to hereafter as the Inspectorate), who carry out the statutory cost benefit assessment and make recommendations as to whether and on what terms a project licence should be granted. Decisions may also be informed by advice from the APC and external assessors.

Production of the cost benefit assessment is, of necessity, prospective in each case, and it is not by nature an exact science. High quality professional input is provided at all stages of the consideration of a programme of work to enable the necessary sound judgements at the licence application stage and subsequently as licensed work progresses.

The cost benefit assessment is acknowledged to be a critically important part of the regulatory regime established by the 1986 Act. It ensures that animals can only be used when a sound scientific case has been made, and even then only providing that throughout a project animal suffering is minimised as far as is consistent with achieving the objectives of the licensed work. It is an aspect of the licensing system which understandably generates much interest and concern.

I therefore greatly welcome the report of the comprehensive review which the APC has conducted. A tremendous amount of work and thought has been given to it. It constitutes a source of contemporary information and opinion, and it will greatly aid and inform debate as it raises many points and issues to stimulate and shape further discussion.

It is also timely, as consideration is being given to this topic at EU level in connection with planned revision of Directive 86/609/EEC, which the 1986 Act transposes into UK law. I know that the technical expert working group looking at cost benefit assessment on behalf of the EC has considered the APC's report.

I have not attempted to cover every single point made throughout the text of the APC report. However, in order to minimise the risk of omitting to comment on the most significant aspects, and also for general ease of reference, I have thought it best to set out my response against the headings and content in Chapter 6 of the report titled "Summary and Conclusions". I hope this approach proves helpful and addresses the issues the Committee considers important.

The APC report is already being commended for study to all those concerned in the scientific community, by means of a circular to certificate holders. The circular gives particular emphasis to a number of the Committee's points, as italicised, along with other statements and action points in the following paragraphs.

The moral validity of animal experiments

The Government entirely accepts that animal suffering cannot be viewed as a matter of moral indifference. That is a view with which we consider few could reasonably disagree in a civilised society. *We also accept that proposals to use animals in science must be challenged, critically evaluated and justified in every case.* This is, as the APC report points out, consistent with the principles upon which the 1986 Act is founded. The cost benefit assessment provides the cornerstone for this in practice.

We also recognise, and the responses to the APC's consultation exercise for this review confirms, that there is a very broad range of sincerely and legitimately held views on the subject of animal experimentation.

There is an additional point I wish to stress. The idea that the use of animals in science can be justified typically rests on the belief that such use should be allowed to continue if certain conditions are met and if real benefits are to be delivered that could not be obtained by other means. We should not downplay or lose sight of benefit side of the equation.

We have previously stated, in agreement with the House of Lords Select Committee on Animals in Scientific Procedures, that the Government considers it to be morally acceptable for human beings to use other animals for experimental and other scientific purposes, but morally unacceptable to cause animals unnecessary suffering. These are further key principles underpinning the provisions and operation of the1986 Act (and indeed of Directive 86/609/EEC which the Act implements).

Finding the appropriate balance between likely animal welfare costs and potential scientific benefits, as required by the legislation, is a task to which the Government remains totally committed. The cost benefit assessment represents what we believe most people consider the right approach. We also believe that it generally works well in practice, although the fine detail needs to be kept under review.

The scientific validity of animal experiments

We welcome and commend the careful and authoritative consideration the APC has given to the question of the validity of the use of animals in research, and accept the conclusion that such use can indeed advance scientific knowledge. We also agree that the extreme opposite position taken on this in some quarters is untenable.

This also reflects the view taken by Parliament in debating and passing the 1986 Act. The Government fully shares the general view that valid science using animals continues to make a valuable contribution to our society in a number of areas.

We also share the APC view that scientific validity cannot be taken for granted. It must be critically evaluated in each case and, even if established, would not be justification for using animals if there were another way of achieving the objective. This amounts to acceptance of the current position under the terms of the 1986 Act.

We also endorse the APC view that all involved in planning animal studies must consider whether they are as creative and effective as possible in choosing the most appropriate and humane methods and models. This process is essential if the "best science" is to be undertaken and any justifiable animal use and suffering minimised. It must, like the cost benefit assessment itself, be an ongoing process throughout the life of a project.

I believe that scientists involved in planning animal studies are already committed to keeping down animal welfare costs by application of the 3Rs – seeking to replace animal use whenever possible and, when such use is unavoidable, to reduce the numbers of animals involved and refine the procedures to minimise their suffering. It is certainly a priority of the Inspectorate in assessing licence applications against the criteria in the 1986 Act, and in questioning the scientific community in the course of visits of inspection.

There will never be room for complacency, but it would be wrong not to pay tribute here to all that has been and continues to be done in this context, not least by the scientists themselves. For example, we have seen introduction in the pharmaceutical sector of new technologies in developing drugs leading to sustained and

incremental decreases in some types of animal use over recent years,whilst novel medicines have continued to be produced. This is an achievement of which the scientific community can be rightly proud.

The Government's recent creation of the new National Centre for the 3Rs, as recommended by the House of Lords Select Committee, should provide additional help, focus and impetus in this area. The Home Office led Inter-Departmental Group on the 3Rs (IDG3Rs), which brings together Government regulators requiring animal tests with a view to advancing application of the 3Rs in the area of regulatory toxicology, is also making an important contribution.

I note the APC's concerns on regulatory testing, which in turn informs the relevant risk assessments for a wide range of substances, including medicines, vaccines, agricultural pesticides, and a range of other chemicals.

It is primarily for the relevant international and national regulatory bodies concerned to determine the tests they require and how valuable they might be in informing the relevant regulatory risk assessments. That said, no animal testing in this country can be licensed by the Home Office unless all the criteria under the 1986 Act are met. These include the need first to consider non-animal alternatives and then – if animals must be used – to choose the least severe test satisfactory for the purpose.

I fully accept, as do the other Ministers concerned across Government, that all the UK regulators in question have a responsibility to help to minimise the animal welfare cost of safety testing. The participation of these regulators in IDG3Rs– and their involvement, along with that of the Inspectorate, within related bodies at the European and wider international level – is of particular value, for example in encouraging timely introduction of scientifically validated *in vitro* alternatives or more refined *in vivo* procedures.

All UK regulators are committed to application of the 3Rs, and to putting in place the necessary mechanisms to ensure, as far as practicable, that no unnecessary regulatory toxicology testing using animals takes place. I also believe every reasonable effort is made across Government to ensure that such animal testing which is undertaken relies on the mildest possible procedures to achieve the required scientific result. Unfortunately there are at present no alternatives to some animal tests, but the hope is that most of these can eventually be replaced.

We will never however rest on the assumption that nothing more can be done. I am, for example, aware of views among some scientists that some of their colleagues are too conservative. They are concerned that the 3Rs are not being progressed quickly enough in certain areas of toxicology, with there allegedly being insufficient read-across between different areas of testing as new non-animal testing methods and technologies are developed. **I have therefore asked for these concerns to be brought to the attention of IDG3Rs, for them to consider and advise on what scope there might be for further action.**

Finally under this heading, the Government completely accepts all the APC says about the need for good experimental design and planning for animal studies, specifically regarding the importance of high quality statistical input.

Good study design, and the importance in that context of sound statistical advice, is already promoted in a general way by the Inspectorate, among others, in their proactive role of disseminating best practice. It is one of the factors considered by local ethical review processes and by the Inspectorate, both when assessing applications and in reviewing work in progress. It is expected that appropriate statistical advice is taken in planning programmes of work and executing experiments, and a condition on every project licence requires the holder to use the minimum number of animals required to meet the scientific objectives. Study design is also a stipulated component in the mandatory training for project licence applicants.

I have given particularly careful consideration to the recommendation that each establishment should provide a statistical service to its prospective licensees, *but I do not think it would be realistic to make that a requirement*, given that establishments vary considerably in the work they do and the resources at their disposal to help licence applicants.

However, the Inspectorate will continue to encourage good practice in this area, mindful that statistical considerations are often more timely as regards individual studies rather than when a whole 5 year programme of work is being assessed. **This is one of the points highlighted in the communication being sent to Certificate Holders drawing attention to the APC's report.**

I am pleased to note that the APC's Education and Training Committee will be reviewing the experimental design component on the Module 5 training provided to prospective project licensees. I look forward to receiving the full Committee's advice on that in due course.

Factors to be taken into account in cost-benefit assessment under the Act

I agree with the APC that cost benefit assessments involve contestable judgements, and that the quality of such assessments must depend on how they are approached and undertaken.

That is why I am reassured by the fact that this work is undertaken by a professional Inspectorate, which has impressed successive Ministers since the Act came into force by providing high quality cost benefit assessments across the whole range of use of animals in science. Inspectors' commitment to this is beyond question, and their unrivalled collective knowledge and experience means that they are better placed than any other persons or bodies to inform the judgements in question.

I also agree that it is self-evidently important that all factors relevant to costs and benefits are acknowledged, recognised and taken into account. I understand and share the APC's wish to see an authoritative published list consolidating these factors both, as suggested, as a useful reference for all involved in the process and to inform the public. I appreciate what the Committee has already done to collate the information which is currently spread across a number of Home Office sources. *I also accept that such material should be placed on the Home Office website, and that it must be kept under review and updated as required.*

At my request all the existing information published by the Home Office on the cost benefit assessment is being reviewed. The aim is to produce for publication new or supplementary material which takes account of the APC's views and of the factors identified as relevant in the Committee's report.

However, it is important in determining the relevant factors to be realistic as regards the constraints of the 1986 Act. Section 5 confines the cost benefit assessment in each case to the proposed programme of work and the related permissible purpose(s). Parliament did not apparently envisage when passing the Act that costs and benefits would or should be interpreted as open-ended or infinitely extendable concepts. The Home Office as regulator does not therefore have the discretion to be other than balanced and reasonable as to what it can require of prospective licence holders.

We have also been mindful of continuing developments and emerging findings on this at the European level, in connection with the planned revision of Directive 86/609/EEC. We must have regard as well to the fact that there are (as this is written) pending court proceedings in which aspects of how the Home Office interprets and applies the cost benefit are at issue. These are not in my view, however, necessarily reasons for doing nothing in the interim along the lines suggested.

Some particular issues in the application of the cost-benefit assessments

General recommendations to assist in "moving thinking on"

(a) *I recognise that particular concern is generated by scientific procedures which can cause substantial suffering to animals. I agree that such procedures should be phased out as soon as practicable and that best practice should be promoted as regards all use and care of animals in science.*

I understand the concerns underlying the APC's recommendation for negotiated targets on this, and I appreciate that the Committee is suggesting a positive and proactive approach.

I am not, however, persuaded that the kind of targets being advocated would be the right way to move forward. The whole thrust of the 1986 Act itself, and the way it is implemented, is already in the direction at which any targets would be aimed. There is much evidence that all concerned in the scientific community and relevant regulatory bodies are already fully committed, in accord with the spirit and aims of the legislation, to progressing application of the 3Rs – it is difficult to see what value targets would add to these efforts. Moreover, the notion of targets is based upon the idea of moving forward to an attainable goal within a specified period of time, and I do not believe this is realistic as regards many of the animal procedures which cause concern and for which there is at present no prospect of replacements or refinements in the short or medium term.

I agree with the APC that there might be benefit in the Committee, jointly with the Home Office, facilitating meetings of relevant stakeholders to consider key issues, similar to that held in January 2004 on the use of non-human primates.

(b) *I welcome the proposal that the APC should give further consideration to the more problematic areas of concern.* I would hope there would be a role in that for the kind of stakeholder discussions mentioned at the end of the previous paragraph.

I believe the APC can contribute a great deal to general debate and understanding of the more contentious areas of animal use and what is happening as regards implementing the 3Rs in those areas.

I have already announced to Parliament my agreement to the Committee's recommendations concerning the categories of project licence applications that should be referred to it for advice from the start of 2005, and details have been put on the Home Office website (www.homeoffice.gov.uk/comrace/animals/index.html). This is on the understanding that the applications referred will not be unduly delayed, and that the arrangements will be subject to review.

(c) *I support the APC's idea that thinking within the Home Office on current good practice*, in the context of the cost benefit assessment and of other aspects of administering and ensuring compliance with the 1986 Act, *should be widely disseminated*. **A suitable vehicle for this would be the annual report of the Chief Inspector, the first edition of which will be published shortly.**

Definition and description of costs to animals

That the "costs" of a study should not be "simply a description of what will happen to the animals, but of what this will actually mean for the animals in practice", has long been generally accepted. It underpins the 1986 Act, and reflects current good practice, in which the various social and psychological costs mentioned by the Committee can be and are taken into account. I welcome the important efforts made by the Inspectorate to encourage, establish and enhance that good practice.

There are, however, a number of practical and other problems about routinely factoring into the cost benefit assessment aspects such as capture, confinement, transport, husbandry systems and general handling. Some of these cannot be estimated or assigned to a particular project at the time an application is made, and others may change during the course of a programme of work.

For example the expected source of required animals, the performance of the breeding colony, and the precise husbandry conditions are often not known when a licence is sought for a programme of work, which can be planned for up to 5 years ahead. Where information on such factors is known at the application stage, it can change as the licensed work proceeds. Also, when the relevant data is available, it is difficult to define and gauge the costs, to assign them to any specific study, or to judge how much relative weight to attach to them.

As I indicated earlier, it can be argued on legal grounds that cost benefit considerations should not go too far beyond those directly linked to the regulated components of the programme of work. The Secretary of State must act reasonably in determining what to take into account under the terms of section 5(4) of the 1986 Act, not least if successful challenge in the courts is to be avoided. In some instances – such as with transport of animals – other legislation "owned" and operated by other Government departments also applies.

The Government is not indifferent to the issues raised, and shares the APC's desire that any welfare costs of obtaining and transporting animals for scientific purposes should be acknowledged and minimised. To that end any request to obtain animals listed in Schedule 2 to the 1986 Act, other than from approved designated sources in the UK, requires prior Home Office approval.

Where practicable – as with the particularly sensitive area of imported non-human primates, where some of the likely welfare costs can be assessed for each request – we do try, indirectly through our project licence controls, to ensure that animals are only carried long distances when there is no other option. Then as a minimum we seek compliance with DEFRA's Welfare of Animals (Transport) Order and with related IATA regulations. But we have to keep in mind that strictly speaking the Home Office's powers in law relate primarily to the use of animals in scientific procedures, rather than to their acquisition or transport.

Exceptionally some of the considerations cited by the Committee can and are legitimately weighed in the cost benefit assessment in certain cases, where it is both practicable and where direct relevance to the planned programme of work can be demonstrated. *We have no plans at present to go beyond this by making the kind of costs the APC mentions formally part of the section 5(4) cost benefit assessment for all animals in every case.*

Assigning severity limits and bands

I have already responded to this part of the Committee's report, by asking it to carry out further work reviewing severity bands and limits, and to make practical recommendations for the future. I know that a working group of the APC has since been established to take that forward, and that in due course I will receive further advice from the Committee.

Duplication of animal studies

The Government agrees that unnecessary duplication of animal studies is unacceptable, and that all concerned should take appropriate measures to prevent it. However, the Government has no evidence that this is a significant problem in the UK.

The APC report refers to the Inter-Departmental Data Sharing Concordat. A review of the operation of the Concordat has recently been conducted, involving all the regulatory bodies concerned. The outcome is to be attached to the relevant IDG3Rs minutes, which are on the Home Office website (www.homeoffice.gov.uk/docs2/interdept3rs040818.htm#meetings).

The Concordat has ensured regulators promote data sharing within the scientific community. *I can assure the Committee that the working of the Concordat will continue to be monitored, and it will be formally reviewed again in 2006.*

Practical procedures for cost-benefit assessment

The Government accepts that the cost benefit assessment should be carried out in a way that is rigorous, comprehensive and open as possible, and that creative and imaginative thinking – of which there are already many examples – should continue to be encouraged.

Researchers' responsibilities and the project licence application form

The primary purpose of the project licence application form is to capture the data needed for the Inspectorate to perform its statutory duty of assessing and advising on applications, and for the Secretary of State to take licensing decisions. This of course includes the information required for the necessary statutory cost benefit judgements, and to establish that applications conform to the other requirements of the 1986 Act. I should add that this does not amount to the Home Office making the case for licences on applicants' behalf.

Although the Inspectorate has found that the form has served its purpose well, the Home Office has always been prepared to consider possible improvements, not least following recommendations on the matter by the House of Lords Select Committee.

Indeed, following close consultation with the scientific community and other stakeholders, a revised version of the form of application, with related guidance notes, is being introduced, to make it easier for applicants to provide the information necessary for assessment. The APC's views were taken into account in the course of this revision, and the new form I believe goes some way to addressing the concerns raised.

Other review processes

The Government shares the APC's view that the various cost benefit assessments of planned animal studies, as performed by a number of bodies for different purposes at different stages, do not amount to unnecessary duplication. On the contrary, as the Committee points out, all have an important part to play, and add value in ensuring that proposals are subject to an appropriate degree of critical and wide-ranging evaluation. This all helps to ensure that animal use is only sanctioned when it can be fully justified and then at the minimum necessary welfare cost.

Scope of licences subjected to cost benefit-assessment

I do not accept that "large" licences, which give authority for a range of different studies and test procedures, are not amenable at the application stage to effective cost benefit assessment. The terms and conditions of the licences define the safeguards to be put in place and applied on a study-by-study basis, to ensure compliance with the key 3Rs requirements of the 1986 Act.

It would not be practicable on administrative or economic grounds for a separate licence application to be made and considered for each individual material for which safety testing was necessary, given the number of compounds that need to be tested, often at short notice.

In fact in some ways the cost benefit assessment in these cases is often more straightforward than with other types of proposed animal research, where the likely direction the work might take cannot be easily predicted. Licence conditions ensure that all appropriate steps are taken – for example involving local ethical review processes – to ensure that all the justifications and other requirements under the 1986 Act are met before individual animal testing studies are undertaken. Moreover, like all establishments where animal work is undertaken, there are regular compliance checks by the Inspectorate to ensure that the required safeguards are both in place and effective.

In the absence of firm evidence of difficulty of the kind described, I do not intend to act on the suggestion that the appropriateness of the licences in question should be reviewed.

Cost-benefit assessment as a continuous process

The Home Office has previously stated that the cost benefit assessment should be an ongoing process rather than a one-off event, with all relevant considerations kept under review as projects progress and new information becomes available. This is current policy and practice. Licence holders are required to seek to maximise the potential benefits of their work, while minimising animal use and suffering at all stages of their projects.

I agree that local ERPs, in accordance with the aims and objectives they were given when the Government required them to be set up, have a crucial role to play. They are well-placed to ensure that projects and individual studies in their establishments are carefully reviewed, so that the latest developments in the 3Rs can be promptly applied, both to programmes of work in progress and in future cost benefit assessments. I believe this is happening in many designated establishments, but **it is another point in the APC's Report which is being drawn to the attention of Certificate Holders, reminding them that their ERPs should be adopting that approach**.

The Home Office Inspectors already take account of interim and retrospective ERP reviews in discharging their own duties under the 1986 Act, not least when conducting inspections and the regular discussions they have with licence holders during the lifetime of projects. Knowledge and experience of general value thus gained are shared within the Inspectorate and I am confident that in this way any lessons to be learnt as regards the 3Rs and cost benefit assessments, both for current and future projects, are taken on board.

I cannot speak for or exercise control over funding bodies, but *I endorse the APC's view that such bodies also have a role in ensuring that application of new 3Rs advances can be facilitated in the projects they sponsor*. Our experience has again been that this is reflected in practice, with funding bodies being keen only to offer to finance work which the Home Office will be able to license under the 1986 Act. **The Home Office maintains a dialogue with the funding bodies on matters of common interest, and I will ensure that the APC's views are fed into that.**

Enhancing transparency in cost-benefit assessments under the Act

I broadly support the recommendations the APC has made under this heading.

Case material to illustrate the reasons for the judgements that are made

I agree that the forthcoming annual reports on the work of the Inspectorate would provide an appropriate vehicle for publication of information and comment on cost benefit assessments raising points of general interest or significance. As part of the Inspectorate's work, I am sure the Chief Inspector has already been thinking about this. However, I should caution that making case material public might not be easy, not least as there will be issues of confidentiality to be considered.

Widening involvement in cost-benefit assessment

I share the APC's view, as also separately expressed by the House of Lords Select Committee among others, of the importance of lay participation in the ERP. It follows that the expected costs and benefits of a proposed programme of work must be presented to ERPs in clear non-technical terms. We have tried to facilitate this through the existing and the new project licence application form and related guidance notes. I hope that in practice material in support of applications is put forward in accessible form, and that it is robustly challenged locally when not. **I have however asked that a reminder on this should be included among the other specific points to be stressed in the circular being issued to Certificate Holders.**

Providing more meaningful information about licences and severity

I have already accepted, following earlier recommendations from the APC and the House of Lords Select Committee – and in line with the Government's general commitment to greater openness – that abstracts of project licences could usefully be placed on the Home Office website. The first such abstracts were posted on the website before the end of 2004.

This is a major step which will undoubtedly aid greater transparency and understanding of the perceived costs and benefits involved in particular cases where licences have been granted.

At present I do not think, however – given the complex, predictive and inevitably disputable nature of the judgements involved in cost benefit assessments – that much useful purpose would be served by trying to go beyond this.

I know that the APC Working Group considering severity issues is now looking at how statistical data might be captured to reflect the suffering actually experienced by animals used in scientific procedures, as requested by my predecessor in response to a related recommendation by the House of Lords Select Committee. I gather a pilot study is planned. I look forward to receiving the APC recommendations on that in due course.

Andy Burnham MP
Parliamentary Under Secretary of State
Home Office
2 Marsham Street
London
SW1P 4DF

12 July 2005

Dear Mr Burnham

GOVERNMENT RESPONSE TO THE APC'S REVIEW OF COST-BENEFIT ASSESSMENT IN THE USE OF ANIMALS IN RESEARCH

In 2003 the APC published its report "Review of Cost-Benefit Assessment in the Use of Animals in Research", and your predecessor Caroline Flint wrote to me on 28 March 2005 giving the Government's response. At its meeting on 22 June the Committee discussed the response and asked me to pass on the following comments.

2. The Committee welcomed the Government's response and the commendation of the Report for study and discussion. We were pleased, in particular, by the appreciation of the 'careful and authoritative consideration' which the Report gave to the question of the validity of the use of animals in research, and also by the undertaking given to publish a range of further information and commentary on the work of the Inspectorate.

3. The Committee recognises that it does not fall to the Home Office alone to make progress in relation to the various concerns which the Report raises. We will, therefore, be looking for ways of advancing discussion of these matters through meetings with stakeholders. I should stress two areas of particular significance:

1. The Committee recognises, as the Government response highlights, that there is much good practice in regard to Cost/Benefit assessment and that scientists are committed to reducing costs to animals. Our concern is that good practice should become common practice, and our consideration of project licence applications referred to the Committee indicates that there is still room for improvement.

2. It is commonly – and we believe, properly – said that the use of animals in scientific experimentation is a regrettable necessity. It follows that there should be a determination to work imaginatively and constructively to bring about the end of animal use. Our interest in exploring with stakeholders the case for targets for an end to certain uses of animals arises from this perspective. In relation to the obviously quite different area of environmental pollution, it has been the case that demanding targets have been identified as providing a goal even where these targets may require technological and other innovation if they are to be met. We believe that there is a case to be explored for an analogous strategy in relation to animal use.

4. You will be aware that the Committee reviews progress in relation to acceptance of the recommendations from its Reports at an appropriate time. We have a working group on suffering and severity, which will report to you, I hope, before the end of the year. After that group has reported, we will plan to undertake such an appraisal.

5. I should also mention that we have been encouraged by the Government response to try to make the specific statement we made on validity more widely and readily available. We hope that this balanced and considered statement may assist the general discussion, and we will advise you of our plans in relation to this in due course.

Yours sincerely

MICHAEL BANNER

ANNEX H

APC WORK PROGRAMME FOR 2006

The work of the Committee's Sub-Committees and Working Groups

Objective	Target Date
Research & Alternatives Sub-Committee	
Monitor remaining 6 unfinished research projects	Ongoing
Review the functions of RASC in view of the reduced budget and recommend to the APC either a new reduced remit or termination of the Sub-Committee.	
Primates Sub-Committee	
Advise Home Office as required on suitability of overseas sources of primates.	Ongoing
Assess the justification for the use of primate models in certain areas of research, especially brain research.	
Develop an overview of current situations/trends in the use of primates in medical research and the understanding of diseases, excluding regulatory toxicology.	
Housing and Husbandry Sub-Committee	
Continue to explore, with the Home Office, what mechanisms exist for promoting good practice and how these are used.	Ongoing
To examine the format of the existing users' and breeders' Codes of Practice, with the aim of providing recommendations relating to any future revision resulting from changes in European legislation.	December 2006
Education and Training Sub-Committee	
Finalise report on the revision of training modules 1-4, and present report to APC.	February 2006
Conduct workshop on training module 5.	February 2006
Prepare a report on module 5 to present to main APC.	February 2007
Consider and report on issues relating to accreditation of training courses, including clarification of expectations and roles, assessment of trainees and auditing of courses.	February 2007
Hold workshop for certificate holders.	?
Applications Sub-Committee	
Consider applications for project licences referred to the Committee by the Home Office for advice, and provide advice to Home Office.	As required
Conduct review of the sub-committee's procedures.	December 2006

Suffering and Severity Working Group	
In light of successful preliminary pilot study on the retrospective assessment of suffering and severity, commission and monitor more widely scoped pilot study in conjunction with LASA.	January 2006
Assess pilot study report and submit to APC.	Late 2006
Schedule 1 Working Group	
Review outstanding questions about the use of CO2 and inert gases	June 2006

B: Items for consideration by the main Committee

Objective	**Target Date**
Welfare of fish used in experimentation.	
Monitor revision of European Directive 86/609.	When appropriate
Advise on skills to be sought in Home Office's recruitment of APC members.	Early 2006

Glossary

Arboreal – tree-dwelling, pertaining to trees.

Artificially induced mutant – artificially-induced mutant mice have genetic changes that result from chemical or other interference with their genes.

Bioassay – the shorthand for *biological assay*, a type of in vitro experiment, typically with the aim of measuring the effects of a substance on a living organism.

Botulinum Toxin – the toxic compound produced by the bacterium *Clostridium botulinum* (commercially known as *'Botox'*) that is used to relieve various medical conditions including painful spasticity.

Cephalopods – invertebrate animals comprising members of the class *Cephalopoda*, including nautilus, cuttlefish, squid and octopus.

Embryo aggregation chimaeras – a collection of embryos containing genetically distinct types of cells.

Embryonated egg – an egg which contains an embryo.

Equidae – the *Equidae* family of mammals which have a single functional digit although the second and third digits persist as splint bones. *Equids* include horses, asses and zebras.

Ethology – the scientific study of animal behaviour.

European Pharmacopoeia – the European authoritative treatise on drugs and their preparations.

Euthanasia – the deliberate ending of life in a painless or minimally painful way. It is generally implied that the killing is done for the benefit of the individual animal.

Genetic modification – genetic modification is achieved by transferring genetic material (DNA) itself from one individual to another, which may be of different species (e.g. human DNA into mice).

Homology of structure – a common ancestry between biological structures.

Humane endpoint – the point at which pain or distress is terminated, minimised or reduced by taking actions such as killing the animal; terminating a painful procedure; or giving treatment to relieve pain or distress.

Husbandry (animal) – the practice of breeding, raising and caring for animals.

In vitro – literally "in glass", ie in an artificial environment, outside a living organism.

Intraspinal – within the spinal dura (inner skin enclosing the spinal cord) within the spinal canal.

LD50 – (Lethal Dose 50%) is the statistically derived single dosage of a substance that can be expected to cause death in 50% of the animals. This test is being phased out in as many areas of toxicology as possible, in favour of alternative, less severe methods.

Marmosets – small clawed monkeys of the genera *Callithrix* and *Cebuella*, found in tropical forests of the Americas.

Murine – pertaining to or affecting mice.

Neonatal – relating to the period immediately after birth.

Parkinson's Disease – a movement disorder often characterised by muscle rigidity, tremor, a slowing of physical movement, and ultimately, a loss of physical movement and cognitive decline.

Pedunculopontine nucleus – located in the brainstem, it is composed of a wide variety of neurochemical cell types and has been classically considered as one of the main components of the reticular activating system.

Precocial – being relatively mature and mobile from the moment of birth or hatching.

Premedication – preliminary medication, particularly internal medication to produce sedation or or narcosis.

Retrospective reporting – the reporting of data already collected; a study of past events, in contrast to a *prospective study*, which attempts to predict what will happen in the future.

Telemetry – measuring temperature etc at a distance from the subject by monitoring radio signals transmitted from an electronic device which has been previously implanted in the animal.

Three R's – stands for the *replacement, refinement* and *reduction* of animals in research.

Xenotransplantation – the transplantation of cells, tissues or organs from an animal of one species to an animal of a different species.

List of Acronyms

APC – Animal Procedures Committee

ASPA – Animals (Scientific Procedures) Act 1986

BUAV – British Union for the Abolition of Vivisection

CPD – Continuing Professional Development

LASA – Laboratory Animal Science Association

LAVA – Laboratory Animal Veterinary Association

NACWO – Named Animal Care and Welfare Officer

NC3R's – the National Centre for the Replacement, Refinement and Reduction of Animals in Research

NVS – Named Veterinary Surgeons

PSC – Primate Sub-Committee

RCVS – Royal College of Veterinary Surgeons

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