

The Boyd Group  
PO Box 423  
Southsea PO5 1TJ

[www.boyd-group.demon.co.uk](http://www.boyd-group.demon.co.uk)

The Boyd Group

The British  
Psychological Society

*The Boyd Group Papers on*

# The use of Non-Human Primates in Research and Testing

---

*Edited by Jane A. Smith and Kenneth M. Boyd*

June 2002



*Published by The British Psychological  
Society Scientific Affairs Board Standing  
Advisory Committee on The Welfare  
of Animals in Psychology*

# Contents

<b>Preface</b>	<b>1</b>
<b>Summary of the Boyd Group's discussions and conclusions</b>	<b>2</b>
<b>Paper 1: Background information, including three case examples of the use of non-human primates in research</b>	<b>14</b>
<b>Paper 2: Empirical evidence on the moral status of non-human primates</b>	<b>20</b>
<b>Paper 3: The moral status of primates: are apes persons?</b>	<b>33</b>
<b>Paper 4: Welfare considerations in the use of macaques and marmosets in research and testing</b>	<b>38</b>
<b>Paper 5: Use of non-human primates in regulatory toxicology</b>	<b>48</b>

The Boyd Group  
PO Box 423  
Southsea PO5 1TJ  
E-mail: [mail@boyd-group.demon.co.uk](mailto:mail@boyd-group.demon.co.uk) Website: <http://www.boyd-group.demon.co.uk>

Published by:  
The British Psychological Society, St Andrews House  
48 Princess Road East, Leicester LE1 7DR  
Tel: 0116 254 9568 Fax: 0116 247 0787  
E-mail: [mail@bps.org.uk](mailto:mail@bps.org.uk) Website: <http://www.bps.org.uk>

Incorporated by Royal Charter  
Registered Charity No 229642

June 2002

ISBN: 1 85433 371 2

Any part of this document may be reproduced  
without permission but with acknowledgement.

# Preface

**The Boyd Group** is a forum for dialogue on contentious issues in laboratory animal use.

This collection of papers is the result of a series of wide-ranging discussions between members and observers of the Group, who offer a diversity of perspectives on the use of animals in science generally, and differ in their opinions on the justification for using non-human primates in research and testing.

The broad aims of the Boyd Group discussions on the use of primates (as on other issues addressed by the Group) were to:

- (i) clarify key issues of concern identified by members;
- (ii) seek points of consensus on these issues;
- (iii) explore points of disagreement and the reasons for them; and
- (iv) where possible, make recommendations on aspects of common concern within the Group.

In a sense, these papers tell only part of the story of the Boyd Group's work. It is difficult to capture the process of discussion in printed words (a process in which understanding between people who have rather different perspectives and experiences in relation to the issues can be enhanced – even if, at the end of the discussions, disagreements between them still remain).

It is hoped, however, that the collection of papers will give at least the flavour of the Group's discussions and conclusions, and that this might assist others in thinking through the contentious issues surrounding the use of non-human primates in research and testing.

**These papers were prepared by a working party of Boyd Group members and advisers with expertise in primatology, animal welfare, biomedical research and regulatory toxicology. The papers were then debated and agreed by the Boyd Group.**

Members of the working party were:

*Colin Blakemore, Kenneth Boyd (Chairman), Hannah Buchanan-Smith, Richard Byrne, Robert Hubrecht, David Robb, Jane Smith and Les Ward.*

Specialist advice was also given to the Boyd Group by:

*Tipu Aziz, Krys Bottrill, Stephen Lea, Phyllis Lee, Jonathan Seckl, John Stein, David Whittaker and Sarah Wolfensohn.*

The Boyd Group is most grateful to all those who assisted in the preparation of these papers and to The British Psychological Society for publishing them.

**The Boyd Group**

June 2002

# Summary of Discussions and Conclusions

*This summary paper reports the Boyd Group's general conclusions and recommendations on the use of non-human primates in research and testing, and includes brief arguments in support of the conclusions. More detailed evidence and argument can be found in the series of background papers following the summary, which were prepared as part of the Group's discussions.*

## Introduction

### Brief background to the discussions

The use of non-human primates in scientific research and testing is highly controversial. Within the EU, standards of housing, care and use of laboratory primates have been the subject of criticism (see for example, Jones, 1996; Ruhdel & Sauer 1998), and there have also been calls for a total ban on their use. More generally, some campaigners are seeking an extension of legal rights to Great Apes, world-wide.

Britain and France are the major users of non-human primates in research and testing in the EU. In 2000, 2951 non-human primates (mainly marmosets and macaques) were used in scientific procedures carried out in British laboratories (Home Office, 2001). Just over three-quarters of these animals were used in toxicological studies, the vast majority of which were carried out for legislative reasons, and all involved substances intended for use in pharmaceuticals. The remaining animals were mainly used for fundamental and applied research, most commonly on the nervous system and special senses, such as vision. See Paper 1 for further information.

Arguments put forward to justify the use of non-human primates usually point to physiological similarities with humans that are not shared by other species, and which, it is argued, make non-human primates the best, or the only suitable animal models for the work. Paper 1 includes three examples of the use of non-human primates in research, to illustrate the kinds of fundamental and more applied benefits that might be sought from such work, and Paper 5 gives some examples of the use of non-human primates in toxicological studies.

In recent years, the use of non-human primates has become more and more tightly regulated in Britain. Under the terms of the Animals (Scientific Procedures) Act 1986, every use of non-human primates requires special justification, in that such work will only be licensed if it can be shown that no other species is suitable, and further restrictions have been imposed since the Act's inception. In particular, the use of Great Apes was formally banned in November 1997 (though in fact there had been no use of these species in Britain since the 1986 Act came into force, and probably not since the late 1960s/early 1970s), and the use of wild-caught primates was also banned, except where exceptionally and specifically justified. Furthermore, a sub-group of the Government's statutory advisory committee on laboratory animal use, the Animal Procedures Committee, is currently considering 'how to minimise, and eventually eliminate, primate use and suffering' (Home Office 1998). See Paper 1 for further details of legislative controls on primate use in Britain.

### Specific questions addressed in the Boyd Group's discussions

- I. The Boyd Group's discussions focused mainly on the 'moral status' of the non-human primates commonly used in research and testing in the UK and, in particular, on
  - (a) how far the use of non-human primates in science is a very special case, deserving exceptional justification;
  - (b) whether the UK's ban on the use of Great Apes in research and testing should be extended to other species of non-human primate; and
  - (c) if the answer was 'yes' in either case, whether this special status should apply equally to all the various species of non-human primate.

The Group approached these questions by considering physiological, behavioural, psychological and philosophical evidence that could have a bearing on the moral status of non-human primates, paying particular attention to the similarities and differences between Great Apes and monkey species. Two background papers were prepared to support the discussions. The papers explore:

- (i) empirical evidence on the moral status of non-human primates (Paper 2,) and
- (ii) the possibility that these animals might be regarded as ‘persons’ (Paper 3).

2. The Group also considered what might count as sufficiently strong reasons for using non-human primates in research and testing (where it was accepted that there might be at least some use of these species). Here, the focus of discussions was on the use of monkeys in fundamental research including consideration of the case studies presented in Paper 1 and in regulatory toxicity testing (Paper 5).

3. Finally, and throughout the discussions about moral status and justification for use, members sought consensus on practical steps that could be taken to safeguard, and where possible improve, the welfare of non-human primates currently used in research and testing. A further background paper was prepared as part of these discussions (Paper 4).

The conclusions from all these discussions, along with brief arguments to support them, are reported below. More detailed evidence and arguments are contained in the collection of papers that follow this summary.

## Conclusions from the discussions

### I Moral status of non-human primates

#### I.1 Moral status of Great Apes (chimpanzees, pygmy chimpanzees, gorillas, orang-utans)

- (a) *Consideration of a wide range of available evidence shows that Great Apes have complex mental abilities. These are likely to enhance their capacity for suffering to such an extent that it is unethical to confine them in laboratories and use them in research and testing.*
- (b) *For this reason (as well as on grounds of conservation of the species in the wild) the use of Great Apes in research and testing should be prohibited world-wide.*
- (c) *The question whether, further than this, Great Apes have ‘rights’ is more contentious and remains unresolved.*

There is very strong, clear evidence that Great Apes have complex mental abilities similar in some important ways to those of humans. For example, the evidence explored in Paper 2 strongly suggests that the animals have:

- a sense of self, such that they have insight into their own thoughts and feelings;
- a developed sense of time and purpose, so that they can think about the future and reflect on the past;
- an ability to empathise with the thoughts and feelings of other members of their own species; and
- more contentiously, perhaps the capacity to communicate their thoughts and feelings via symbolic, syntactic language.

These abilities are likely to enhance the Great Apes’ capacities for suffering to such an extent that it is unethical to confine them in laboratory housing and use them in scientific procedures. A ban on the use of Great Apes in research and testing (as currently in place in the UK) is strongly supported on these grounds, as well as on grounds of conservation of the species in the wild, and should be respected world-wide. There is no evidence to suggest morally relevant differences between the mental capacities of the different Great Apes, and a world-wide ban should apply equally to all species.

# Summary of Discussions and Conclusions (*continued*)

Whether Great Apes are ‘persons’, having rights, to life and liberty for example, are more contentious questions. As already noted, evidence suggests that they have the capacity for self-consciousness, often considered a necessary and sufficient condition for personhood. However, making self-consciousness the touchstone could accord personhood to Great Apes, but not to human neonates, for example. Similarly, rights might be denied both to Great Apes and neonates on the grounds that rights are correlative with responsibilities, which may be too much to expect of apes, as well as neonates. An alternative view, explored in Paper 3, is that the ‘capacity for intersubjectivity’ is a sufficient condition for personhood (i.e. that persons share a capacity to recognise and have insight into each other’s mental states). But the difficulty with this approach is that capacity for intersubjectivity can only be established by the judgement of another person, which, of its nature, is subjective. Nevertheless, the fact that many primatologists and others judge that Great Apes possess a capacity for intersubjectivity is weighty testimony, and arguably puts the onus of proof on those who judge that Great Apes are not persons. Moreover, in spite of unresolved debate about apes’ personhood, the evidence on grounds of suffering alone predicates against their use in research and testing.

## **1.2 Moral status of other non-human primates**

- (a) *Non-human primates commonly used in research (mainly marmosets and macaques), do not appear to share the most sophisticated mental abilities of Great Apes.*
- (b) *Nevertheless, there is strong, though not incontestable, evidence that the general richness of monkeys’ social lives and mental abilities means that compromising their way of life by using them in research and testing has the potential to cause them greater social and mental suffering than other laboratory species.*
- (c) *Therefore, the Boyd Group is agreed that any use of non-human primates in research and testing requires very strong justification (and the nature of any such justification is explored in Section 2 below). Further than this, some members of the Boyd Group argue that these animals should not be used at all.*

Monkey species commonly used in research (mainly marmosets and macaques) differ from Great Apes in that the weight of evidence suggests they do not share the apes’ most sophisticated mental abilities (once thought to be exclusively human); or, at least, that they possess them in more rudimentary form. For example, the evidence presented in Paper 2 suggests that, when compared with Great Apes, monkeys have a less well-developed ‘theory of mind’ – in that, for example, their insight into their own thoughts and feelings, ability to empathise with others of their kind and/or to imagine a personal future and ponder on the past, are less well developed<sup>1</sup>. Nevertheless, the evidence in Paper 2 (pp.26–27) also shows that monkey species commonly used in research have rich mental abilities related to their complex social lives, which involve rich and highly discriminative social interactions. These abilities appear to be more developed in monkeys than in other non-ape primates (such as lemurs, lorises and bushbabies)<sup>2</sup>. It is clear that compromising a monkey’s social life (for example, by confinement in the laboratory) causes suffering. Furthermore, evidence suggesting that at least some monkey species have an ability to think about/reflect on what is happening to them could bring an extra dimension to their capacity for suffering.

The relative moral status of monkeys compared with other laboratory animals is more contentious. To begin with, monkeys comprise a heterogeneous group of species, with a wide range of habitats, social organisation, behaviour and psychological attributes. More generally, it is difficult to find ways of comparing the potential for suffering of any given

---

<sup>1</sup> Whilst this conclusion applies at least to the monkey species commonly used in research, it may not be applicable to all other non-human primates. Capuchin monkeys, which are not used in research in the UK at present, show considerable cognitive skills, which could be superior to other monkey species and, in some aspects could be similar to the abilities of Great Apes (see Paper 2).

<sup>2</sup> These animals used to be known as prosimians, but are now classified as strepsirhini (see Paper 2).

species (in this case, say, a marmoset or a macaque) with the potential for suffering of another species (such as a dog, or a rat, for example). Furthermore, the importance for moral status of a potential for what might be called social or mental suffering, as compared with a potential for more physical suffering (feeling pain, for example), is uncertain. It is more difficult for us, as humans, to judge capacities for suffering in species which are evolutionarily more distant from us, and it might be argued that according any species of monkey special moral status reflects human prejudice in favour of species more like ourselves.

Nevertheless, neither lack of *proof* about monkeys' capacities to suffer, nor the possibility of equivalent suffering in other non-primate species, need prevent us from according special moral status to monkeys. There is strong, though not incontestable, evidence (Paper 2) to suggest that the general richness of monkeys' social lives and mental abilities means that compromising their way of life causes them greater suffering than other animals which do not share these capacities. This potential for social and mental suffering implies, at least, a need for very strong justification if these monkeys are to be used in research and testing – and some members of the Boyd Group go further, arguing that these animals ought not to be used at all.

On present knowledge, this is the best consensus that can be achieved within the Boyd Group on the question of moral status of non-human primates. The statement does not preclude arguments in favour of special moral status for other, non-primate, species (but the focus of the present discussions is on evidence about non-human primates). Nor does it preclude future agreement within the Group that the ban on use of apes should be extended to particular monkey species (and perhaps all non-human primates) – should further evidence, judged less contestable, mark any of these species out as closer to Great Apes and/or more strongly different from other species in their potential for suffering.

## **2 What might be a 'very strong' justification for using monkeys in research and testing?**

The conclusion that very strong justification is required if monkeys are to be used in research and testing, requires further qualification. Where it is accepted that there might be *some* use of non-human primates, what could be the nature of such a justification? To attempt to answer this question, the Boyd Group considered two broad areas in which non-human primates are currently used – fundamental research and regulatory toxicity testing.

### **2.1 General considerations**

It is axiomatic that, whatever the reasons for using monkeys, the 3Rs (of replacement, refinement and reduction of animal use) would have to be very rigorously applied. That is:

- the use of monkeys would be the only possible means of addressing the questions, or would offer very significant scientific advantages over all other possible alternative approaches – this judgement being based on an active search for alternatives;
- the minimum possible number of animals would be involved, consistent with the aims of the work, and the experimental design would be very robust;
- every effort would be made to refine all aspects of the use of the monkeys (from birth to death of the animals), and the possibilities for further refinements would be continually reviewed. Thus, the following aspects would all be considered, and monitored throughout the project (see also Boyd Group recommendations in Smaje *et al.* 1998):
  - source and transport of the animals;
  - husbandry and environment of the animals;
  - experimental design and techniques used;

# Summary of Discussions and Conclusions (*continued*)

- care of the animals before, during and after each procedure;
- end-points of the procedures; and
- method of killing the animals (or re-use, re-homing, or other fate at the end of the procedures).

Beyond these requirements to minimise the harms caused to monkeys, however, there is uncertainty about what might constitute a sufficiently serious or worthwhile reason for using these animals in research or testing. Thus, there is considerable room for debate about the nature of the special protection that monkeys (and other non-human primates) should receive under UK law.

## **2.2 Example 1: Use of non-human primates in fundamental research**

For example, if the justification required is that monkeys are the best, or only, model for humans in studies of significant problems for human health, where would this leave fundamental research? In 2000, around one-in-six of all the monkeys used in scientific procedures in Great Britain was used for fundamental biological research. That is, in biological studies aimed either ‘solely at an increase in knowledge’, or ‘with a view to providing a practical solution to a medical or veterinary problem once the issues are more clearly defined and understood’ (Home Office, 2001, p.5). Can such objectives provide very strong justification for using monkeys?

To explore this question further, the Boyd Group invited scientists using monkeys in fundamental research to describe their work to the Group. Two specialist primatologists also joined the discussions. Summaries of the scientists’ presentations are reported in Paper 1. All three of the examples in Paper 1 were described by the scientists as fundamental research, presumably because none of the projects involved *directly* applying the knowledge gained. Nevertheless, the cases varied considerably in how close the work was to a potential medical application.

The first example described work carried out in the USA, but it was also noted that similar work is in progress in the UK. The other two projects (as well as the UK equivalent of the first project) had obtained funding from major UK granting bodies, after fierce competition with other projects for limited funds – and thus, in each case, the science had been subjected to competitive peer review. Moreover, in all three cases it was argued that the use of monkeys was the only possible means of achieving the objectives of the work, and the researchers all said that they had applied the 3Rs as rigorously as they could. However, the question remained whether the potential benefits of the work could be said to be sufficient to warrant use of monkeys.

It is clear from the three case studies that there is considerable blurring of the boundaries between fundamental and applied research. At what point in such a continuum of distance of work from potential application could there be very strong justification for studies involving non-human primates, and at what point should such work no longer even be considered?

There are two possible categorical replies to these questions. As already noted, some members of the Boyd Group argue that there is *no* position in the continuum at which the use of monkeys, or other non-human primates would be justified. At the other end of the spectrum, it can be argued that, provided the science is high quality and there are no alternative ways of achieving the objects of the work, then use of monkeys in pursuit of *any* knowledge relating to human physiology would be worthwhile – since, through serendipity, any knowledge could one day turn out to be useful in addressing a problem of human health. Indeed, there are numerous examples of unforeseen or unintended medical benefits arising from fundamental physiological research.



However, members of the Boyd Group are agreed that the latter argument is not strong enough to justify the use of non-human primates in fundamental research. Such studies ought to have more *specific* aims, in that, at the very least, they should address key questions relating to human (or veterinary) physiology or behaviour, with the strong expectation that better scientific understanding will provide a foundation for future research leading to medical advances – and the science should be impeccable. More than this, the strength of any such justification has to be judged case-by-case (see further comments in Section 3, below).

### **2.3 Example 2: Use of non-human primates in regulatory toxicology (see Paper 5)**

As already noted, three quarters of the non-human primates used in laboratories in the UK are involved in toxicological studies of pharmaceuticals. Almost all of these studies are reported to be performed for legislative reasons – that is, to meet the requirements of UK, EU or foreign regulations intended to ensure that new pharmaceutical products are safe to use, and that any risks to the consumer are minimised (Home Office, 2001). In the UK, non-human primates are only rarely used in testing substances intended for non-medical use. For example, in 1998, 40 marmosets or tamarins were used to test ‘substances intended primarily for use in industry’ (Home Office, 1999). These substances were probably phthalates, tested because of concern about the safety of using them in toys mouthed by babies.

In practice, toxicologists argue that non-human primates are used only when they are, scientifically, the most appropriate species for the particular study, and no non-animal alternatives are available and/or acceptable to the regulators. The main use of these animals is as ‘second’ species, after rodents, in routine chronic and acute toxicity tests, when dogs (the more usual non-rodent species) are considered unsuitable (e.g. because dogs are particularly sensitive to the test compound). In addition, non-human primates tend to be used when the test compound is antigenic to other species, or when there are physiological or metabolic similarities between non-human primates and humans that are not found in other species (e.g. similarity of receptors). In some cases, it is possible that toxicologists may regard non-human primates as the *only* scientifically suitable species – for example in testing certain biotechnology-derived pharmaceuticals (‘humanised’ medicines). See further discussion in Paper 5.

Decisions to use non-human primates in testing can also be influenced by pressures and considerations other than their scientific validity as models for humans. Because non-human primates have been used in testing in the past there is a great deal of historical and background information available from these species, with which to compare the results of new studies. Thus, even though there might be potential to use other species such as mini-pigs and ferrets, continued use of non-human primates can be favoured owing to concern that data will be rejected by regulators if they are from species for which there is relatively little background data. If data prove unacceptable to the regulatory authorities there can be costly delays in bringing the test compound to market – the costs of delays being seen in terms of financial expense and time, (so affecting company profits, share prices and dividends etc), the potential effects on human health of delaying the new medicine, and also the requirement to use more animals in another round of tests. Some members of the Boyd Group argue that previous background data should not be allowed to dictate the continuing use of non-human primates.

Similarly, growing consumer demands for safety of chemical products, coupled with an increasingly litigious consumer climate, can put pressure on companies to test more widely on animals before moving to human studies, and this may involve pressure to use non-human primates because of their similarities with us.

Some members of the Boyd Group believe that non-human primates (and other animals) should not be used in toxicity

# Summary of Discussions and Conclusions (*continued*)

testing at all. However, whilst non-human primates continue to be used, there is an urgent need for everyone involved critically to evaluate decisions to use these animals in testing, in order to ensure that choices are made strictly on sound scientific grounds, and not as a result of other pressures that could be overcome.

Currently, toxicologists argue that it is difficult to meet the goal of characterising the potential toxic effects of new pharmaceutical substances, in order to provide evidence on which to base decisions about whether to move to human testing, without the use of non-human primates in at least some cases. It might be thought that use of transgenic mice expressing specific human receptors could eventually do away with the need for testing in more than one species altogether. However, this is unlikely because the remainder of the animals' physiology is unaffected by the specific genetic modification, and there remains a need to examine wider systemic effects of drugs – which, presently, requires the use of two different species.

In future, development of better *in vitro* tests, which can be used as pre-screens at least, should help to reduce or eliminate the use of *in vivo* tests, perhaps including use of non-human primates. This approach has resulted in an enormous saving in the use of animals in screening compounds for potential efficacy, and there is a need to develop similar screens to look for toxic effects.

When no non-animal alternatives are suitable, decisions whether or not to use non-human primates in regulatory toxicity tests should take into account the particular benefits of the substances being tested (see 3.4 below), the scientific need to use non-human primates, and all relevant welfare considerations. The judgements involved can be complex, and there is a need for careful consideration of the issues posed in each case – see Paper 5 for further discussion.

Clearly, discussion and negotiation with the relevant range of regulatory authorities is desirable at an early stage in study design. Although, to a large extent, this already goes on, there is sometimes a need for better communication between regulators and scientists. In addition, there is also a need for deeper understanding of the biology of the various species that might be used, so as to ensure that in each case the choice of species is as scientifically informed as possible.

As in fundamental research, there is no straightforward 'formula' for arriving at decisions on whether or not there is justification for using non-human primates in particular regulatory toxicity tests. Once again, the issues need to be considered case-by-case.

## **3 Ethical review of proposals to use non-human primates in research and testing**

From the above discussions, it is clear that there have to be very strong reasons to justify the use of monkeys in fundamental or applied research or in toxicity testing, and that, if these reasons are to command confidence (indeed, if these animals are to be used at all), there is a need for very rigorous ethical review of projects. Because there can be no generally applied formula for such decisions, it is essential that the procedures used to arrive at them are as thorough, effective and transparent as possible.

### **3.1 Involving appropriate expertise**

In Britain, ethical aspects of the use of non-human primates are considered in a variety of different forums. These include reviews carried out by:

- the Home Office inspectorate – in deciding whether or not projects involving animals might be licensed under

the terms of the Animals (Scientific Procedures) Act;

- local ethical review processes in each establishment in which animals are used – in advising the establishment's Certificate Holder (who bears ultimate responsibility for the use of animals within the establishment) whether or not to sign project licence applications and forward them to the Home Office; and in considering wider issues arising in the use of animals within the establishment; and
- funding bodies or commercial sponsors – in deciding whether or not to grant funds to support such work.

Each of the different review processes can bring valuable perspectives to bear on the ethical issues arising in the use of non-human primates. It is important that, wherever possible, each process involves appropriate experts in the care and use of non-human primates, who can act as the animals' advocates, and can advise, for example, on:

- whether and how far the use of non-human primates is scientifically justified;
- whether all possible measures have been taken to avoid the use of non-human primates and to minimise the impact of the research on these animals; and
- how far local facilities for husbandry and care of the animals will meet the animals' needs and ensure the highest standards of welfare.

Whilst each of the different review processes should enquire into all these questions, the focus of the reviews will vary, and the questions will be asked from a different perspective in each case. Each process can therefore add value to the overall ethical review. For example, funding bodies have a particular role in enquiring into the scientific justification for the use of non-human primates, and local ethical review processes are vital in ensuring that all possible steps are taken to enhance and safeguard the welfare of the animals *in practice*.

### **3.2 Explaining the Home Office's approach**

The Home Office Inspectorate (HOI), acting on behalf of the Home Secretary, bears the ultimate responsibility for judging whether the use of animals is justifiable under the terms of the Animals (Scientific Procedures) Act 1986 (ASPA) and can be licensed to proceed or not.

It is unclear, however, how the HOI arrives at such judgements. Whilst the Chief Home Office Inspector has provided guidance on the factors that should be taken into account in such ethical review (Home Office 1998), this does not explain how, *in practice*, the different considerations are brought together in arriving at a decision whether or not to licence the project. For example, what weight is given to the standing and experience of the research team involved and its source of funding? How are 'quality of science' issues addressed, and how does the HOI obtain the necessary expertise to question such aspects? How far is the lifetime experience of the animals considered? For, example, what weight is given to adverse effects due to the supply and husbandry of non-human primates? How is the value of different kinds of potential benefit distinguished, including scientific knowledge, so that it can be weighed against the harms caused to the animals?

It would be helpful if the HOI would provide case studies to illustrate its approach, particularly where non-human primates are involved, requiring particularly strong, and, in some cases, exceptional justification. Such illustration and clarification of the Home Office's approach:

- would help to inform the debate on how such ethical review is applied in practice;
- could assist others, such as members of ERPs, in carrying out their reviews; and
- might help to enhance wider confidence in the judgements on use of non-human primates that are made under ASPA.

# Summary of Discussions and Conclusions (*continued*)

### **3.3 Using retrospective review to inform future judgements**

Judgements that there is 'very strong' justification for using primates in research or testing have to be made on a balance of probabilities, in particular because it is impossible to predict exactly how useful, in scientific or applied terms, a given project will turn out to be. Moreover, it can take a long time for all the outcomes and benefits of research to become apparent (particularly in the case of fundamental research) and these can show themselves in a variety of ways. For these reasons, periodical retrospective review of the fundamental and/or applied outcomes of projects involving non-human primates can be helpful in informing future judgements.

In Britain, the Animal Procedures Committee (APC) could enhance its role in this regard. The APC is established under the terms of ASPA, and its remit includes reviewing all applications for project licences which involve the use of non-human primates in procedures of substantial severity, and those in which it is proposed to use wild-caught primates. The Committee, by virtue of its wide membership (which includes animal welfare specialists and anti-vivisectionists, as well as scientists, veterinarians, philosophers and others) brings diverse perspectives to bear in its ethical review.

The APC can provide an important forum in which judgements on acceptable practice in laboratory animal use can be tested against a diversity of opinion. The Committee should be encouraged to enquire more deeply into how decisions on the use of non-human primates are actually made. For example, it could extend its review to examine retrospectively *any* application or licence to use non-human primates, with a view to informing future ethical judgements.

### **3.4 Review of the use of non-human primates in toxicity testing: benefits of substances tested**

It has already been argued that decisions to use non-human primates in toxicity testing should take into account the particular benefits of each substance being tested. However, in Britain under ASPA, the benefits of using animals in toxicity testing are viewed in relation to the objective of ensuring that products and ingredients can be manufactured and used safely, rather than in terms of the likely benefits/needs for the substances themselves. On these grounds, project licences may permit the use of animals in testing a wide range of different kinds of substance, defined only in general terms in the licence. Project licence holders have responsibility for justifying species choice in general terms to the Home Office, but are not required to do this in advance for *each* substance tested (although, if asked, they must provide justification retrospectively).

Whilst some practical objections are raised (see discussion in Paper 5, pages 55–56), most members of the Boyd Group are agreed that the following steps should be taken to enhance the assessment of benefit when non-human primates are used in regulatory toxicity tests:

- (i) All 'blanket' project licences for the use of non-human primates in regulatory toxicity testing should include an additional condition requiring that the ethical justification for tests be considered by the local ERP on a substance-by-substance basis.

Each time a new substance is brought to, or put forward by, the company for tests involving non-human primates, the case should be referred to the ERP for ethical review that takes into account all pertinent information – including the potential benefits of the substances involved.

In order to enhance the credibility of this process:

- the ERP should include people from outside the organisation concerned, encompassing as wide a diversity of viewpoints as is consistent with reasoned discussion of the issues and client confidentiality, and should preferably

- have a 'lay' Chair who is not involved with the issues at stake, and the relevant HOI should sit in on the discussions as often as possible.

Since relatively few different substances are likely to be tested using non-human primates in a given company, it should not be unreasonable to expect all such cases to be referred to the ERP. This process should enable wider consultation on which uses of non-human primates the company ought to regard as particularly controversial, as well as widening debate on the issues themselves. Practical objections to implementing such reviews might be overcome when it is remembered that the ERP is a *process*, not just a committee, that can be designed to minimise unnecessary delays, whilst at the same time ensuring that all the ethical issues are addressed. For example, each time it is proposed to test a new substance using non-human primates, information about the tests could be circulated to members of the ERP, with members meeting to discuss the proposals whenever one or more of their number raises concerns.

- (ii) The ERP's decision, and the reasons for it, should be communicated to the HOI. This would enable the relevant HOI to comment on the decision, and could assist the HO in building up a body of knowledge on the application of the cost-benefit assessment in such circumstances, so that, in future, the HO could recommend and refine criteria for assessing the potential benefits of substances.
- (iii) The Home Office inspectorate should regularly 'spot-audit' pharmaceutical and contract testing companies' internal enquiries about proposals to conduct tests involving non-human primates, in order to evaluate whether and how far the enquiries are making a difference in practice.

For further discussion, see paper 5, pages 54-57.

#### **4 Welfare considerations in the use of non-human primates in research and testing.**

In spite of the lack of strong agreement on the general moral status issue, and a fundamental difference of opinion on whether or not *any* use of non-human primates should be permitted in future, members of the Boyd Group are agreed that whilst non-human primates continue to be used in research and testing, every effort should be made to minimise the social deprivation, mental suffering, and/or physical harms caused to the animals.

In order to put flesh on the bones of this conclusion, the Group systematically examined and compared the consequences for animal welfare of supply and use of marmosets and macaques (both cynomolgus and rhesus macaques) – that is, the monkeys most commonly involved in research and testing. The results are reported in Paper 4.

Members of the Group are agreed that, whilst non-human primates continue to be used:

##### **4.1 The choice between marmoset (a New World monkey) and macaque species (Old World monkeys) is not always straightforward on welfare grounds, and needs to be considered case-by-case (depending, in particular, on the scientific procedures involved and the objectives of the experiment).**

In general, the breeding, supply and laboratory husbandry of macaques involves greater costs to animal welfare than does the breeding, supply and husbandry of marmosets. On these grounds, it might be argued that marmosets should be the species of choice where possible. However, marmosets are difficult to train to accept handling by humans, and do not

# Summary of Discussions and Conclusions (*continued*)

easily tolerate disruption to, or removal from, their family groups. They also appear to find some routine scientific procedures more stressful than macaques.

## **4.2 The blanket Home Office distinction between New and Old World primates is not helpful.**

Since 1996, the UK Home Office has required that use of Old World as opposed to New World primates must be specifically justified, i.e. that, in practice, special justification is required for the use of macaques rather than marmosets (Home Office 2000, p. 47). However, for the reasons given in 4.1, this requirement is not particularly helpful, since it is not always the case that the use of marmosets involves less cost to animals than the use of macaques. Moreover, both New World and Old World primates are heterogeneous groups, and the distinction between the groups in terms of welfare costs involved in using them breaks down when species other than those commonly used in laboratories (e.g. capuchins) are considered.

## **4.3 Steps should be taken to improve welfare in the breeding and supply of macaques used in research and testing.**

An end to transport of monkeys from source countries should be achieved as soon as possible. In the meantime:

- (i) *Welfare conditions in breeding facilities in source countries should be regularly assessed and monitored against standards expected under British legislation, and improvements made where necessary.* It is understood that Home Office visits have taken place, but more frequent assessment will require more personnel. It would be helpful if reports from these visits were made available to local ethical review processes and appropriate licensees, so that more informed choices can be made about animal supply.
- (ii) *There should be a long-term strategy to build up captive breeding populations of macaques in source countries, so that there is no longer a need to take animals from the wild.* Currently, many of the captive bred animals supplied for research are actually the first generation bred in captivity, and breeding adults continue to be replenished from the wild.
- (iii) *Early weaning of animals should be exceptional and not accepted as routine.* Opinions differ on the most appropriate weaning age for captive-bred infant macaques (see Paper 4 for further details). Weaning is not an abrupt event, but a process lasting over several months. Whilst most infant monkeys can feed themselves at six months, they remain socially dependent on their mothers for at least a year, returning to them when disturbed and to sleep. Unless specifically justified, infants should remain with their mothers until they are no longer dependent on them, and each animal should be considered individually. Possible exceptions arise because, for example, it is preferable to wean harem groups together, and then maintain these animals as a group, in order to avoid disturbing the social relationships between them. Sometimes this can involve a compromise on weaning age, since it is likely to be better to wean a younger animal, of say nine months, with its older half siblings, rather than to postpone weaning and introduce it three months later to an unknown group (Wolfensohn *pers. comm*).
- (iv) *Whilst non-human primates continue to be used and supplied from abroad, transport to establishments in the UK and Europe should be as direct as possible; and means of avoiding a change of transport from air to road for the final leg of journeys to Britain should be investigated.* At present airlines are unwilling to land primates destined for research in Britain because of animal rights action.

**4.4 Further consideration should be given to means of improving welfare in the husbandry of non-human primates, and the actual effects on animal welfare of suggested improvements should be scientifically evaluated. In particular, standards for non-human primate caging require urgent revision, and should be amended and implemented across Europe, since unilateral action by the UK could result simply in work being moved abroad. Individual housing of non-human primates should require exceptional justification, and should never be long-term.**

The minimum cage sizes for both marmosets and macaques detailed in Home Office guidance (1989), and in European standards, are inadequate – particularly in respect of vertical dimensions of cages – and do not reflect current best practice (see Paper 4, page 39). Changes to the European Convention and Directive are currently being negotiated. Once these changes are agreed, it is likely that the Home Office will then amend its 1989 guidance to bring it into line with the revised European codes.

**4.5 Every effort should be made to train non-human primates to accept routine scientific procedures, and so minimise the stress caused to the animals. On both welfare and scientific grounds, repeated, stressful, capture within the cage and sedation of these animals for routine scientific procedures should be avoided.**

Although more difficult for marmosets, such training is usually possible for macaques, and is particularly important for repeated procedures. Telemetric methods for physiological monitoring, and in-cage testing, should be considered and used wherever they would represent a refinement.

## References

- Ruhdel, I.W. & U.H. Sauer (Eds.), on behalf of the European Coalition to End Animal Experiments (undated, probably 1998). *Primate experimentation. A report on the use, supply and housing conditions of primates used for scientific purposes within the European Union*. Deutscher Tierschutzbund e.V. Akademie Fur Tierschutz.
- Home Office (1989). Code of practice for the housing and care of animals used in scientific procedures. HC 107. London: HMSO.
- Home Office (1998). *Report of the Animal Procedures Committee for 1997*. London: TSO.
- Home Office (1999). *Statistics of scientific procedures on living animals, Great Britain 1998*. Command 4418. London: TSO.
- Home Office (2000). *Guidance on the operation of the Animals (Scientific Procedures) Act 1986*. HC 321. London: TSO.
- Home Office (2001). *Statistics of scientific procedures on living animals, Great Britain 2000*. Command 5244. London: TSO.
- Jones, B. (1996). *Current standards in Europe for the care of non-human primates in laboratories*. RSPCA and Advocates for Animals. Horsham, W.Sussex: RSPCA.
- Smaje, L., Smith, J.A., Combes, R.D., Ewbank, R., Gregory, J.A., Jennings M., Moore, G.J. & Morton, D.B. (1998). Advancing refinement of laboratory animal use. A report prepared on behalf of the Boyd Group. *Laboratory Animals*, 32, 137–142.