THE ROYAL SOCIETY

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From the Biological Secretary and Vice-President Professor PPG Bateson FRS
6 June 2001
Our ref: RSWB/JC

Dear Tom

I am responding to your request of 9 April for a response to the call for evidence by the House of Lords Committee investigating the use of animals in scientific research. I enclose with this letter three documents recently produced by the Royal Society on the various issues surrounding the issue: (a) our comment to the Animal Procedures Committee on Cost-Benefit Analysis, (b) our comment to the Home Office on the Ethical Review Process, and (c) our report on Genetically Modified Animals. I would be very happy to give evidence to the Select Committee if such evidence would be helpful. I reproduce below your questions in italics, followed by my answers to these questions.

What have been the strengths and weaknesses in the operation of the Animals (Scientific Procedures) Act since 1986; how do you consider that legislation on animal procedures needs to be changed?

Strengths – The Act has led to the refinement of experimental methods, the reduction of the numbers of experimental animals used in each experiment and the replacement of testing whole animals by the use of test-tube approaches and computer simulations. The Act has generally led to an enhanced awareness on the part of scientists to the welfare issues involved both in experimenting on animals and the holding of animals for scientific purposes. Most scientific journals insist now on high standards of welfare as do grant giving bodies. The Act also gives some (limited) protection to scientists.

Weaknesses – The administration of the Act has undoubtedly become bureaucratically cumbersome. Some of our best scientists have been so impeded that they have changed their areas of research and pharmaceutical companies are threatening to move their research away from the UK. The changing composition of the Home Office's Animal Procedures Committee indicates a swing against medical research and currently only one member of that committee is medically qualified. The Act has also led to inappropriate standardization. The Home Office guidelines on housing have been rigidly formulated on the underlying assumption that the

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conditions of keeping a rodent, say, are the same as those of keeping a bird. The notion that constant environmental conditions is tantamount to good welfare runs counter to modern attempts to enrich housing conditions.

What scientific developments and changes in public attitudes have occurred relevant to animal procedures since 1986; how have researchers and regulators responded to such changes; and do you consider that their response has been appropriate?

Methods of assessing pain, suffering and distress have improved and alternatives to the use of living animals have advanced. The high profile given to animal research has led to the setting up of local Ethical Review Panels that include lay members of the public. The ERPs are important in taking a broader view of the way animals are used in science and provide assistance to scientists on improving conditions and procedures. However, sometimes they duplicate unnecessarily the assessment of the science. The use of various types of environmental enrichment, which the Society welcomes, has been growing steadily. Public consensus on where the balance should be struck between the benefits and the burdens of animal research has moved further in the direction of minimizing the welfare costs to the animas. The movement in public opinion and legislative control has encouraged extreme groups to believe that it will be possible to stop all research on animals, but this is not, in our view, either a sensible or a realistic possibility.

What are the current effective alternatives to animal procedures; and what alternatives to animal procedures might be developed?

Test-tube approaches to biology already provide indispensable analytical tools. They may involve enzymes or other molecular components extracted from cells, isolated cells or cell cultures, and isolated tissues or organs. They are employed for a wide variety of purposes. These include the following:

Identification of the molecules that make up individual cells and carry out their functions, and of the chemicals that cells use to communicate with each other, such as hormones, transmitter substances and growth factors.

Defining the genes that produce these molecules and the way in which genes are regulated

Studying the way in which cells grow, divide, metabolize and die, and defining the action of chemical substances on these processes

Investigating how cells and individual organs respond to drugs, including useful as well as potentially dangerous biological effects

Comparing the strengths of substances that have similar biological effects

İdentifying the way in which substances, including test drugs, are broken down in cells and organs, and the effects of the breakdown products

Assessing the capacity of test substances to cause mutations, which could lead to cance these tests are often performed on bacteria

High speed assays by bio-sensors of drugs and new chemical compounds have improved greatly in the last 15 years. In the pharmaceutical industry, *in vitro* methods are particularly valuable for rapid, large-scale screening of substances to enable a few, out of hundreds of thousands, to be chosen for more thorough evaluation. Techniques for simulating the behavior of complex systems have also improved greatly. Nevertheless, some areas of research, such as animal behavior and whole animal physiology, cannot be replaced by tissue culture and computer simulation of complex systems must be accompanied by empirical work on those systems.

How do you consider that demand for animal procedures will develop in the future; and how should the regulatory system respond?

The use of genetically modified animals will expand in many areas of medical, veterinary, agricultural and fundamental research. The Royal Society does not believe that this requires any change in regulation because of the continuities between the welfare problems raised by the use in research of genetically modified animals are not qualitatively different from those raised by the use of non-genetically modified animals.

Please let me know if you would like more written information from the Society and when I can be of service to the Select Committee by providing oral evidence.

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