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Andrew Linzey and Clair Linzey (eds), *The Ethical Case Against Animal Experiments*
(Urbana: University of Illinois Press, 2018). 216 pp. \$29.95. ISBN 978-0-252-08285-6 (pbk).

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Across the globe, at least 115 million animals are experimented on each year. Because experiments take place behind closed doors, most people know little about what happens, and informed critical engagement is difficult. This well-referenced A4-sized volume performs the valuable service of throwing open the doors of a hidden world and exposing the multiple ethical compromises that perpetuate it. It is timely in a post-Brexit United Kingdom, with animal sentience soon likely to be recognized in domestic law. Research animals, which are overseen by the Home Office, are typically handled, transported, housed and used in ways that fall well below comparable requirements for farmed species, which are the responsibility of the Department for Environment, Food and Rural Affairs (Defra). Because most research animal species are undomesticated, confinement even without experimentation seriously impedes their ability to express normal behaviour.

The volume's first half comprises the 2015 multi-authored report of an interdisciplinary and international working group of the Oxford Centre for Animal Ethics titled 'Normalizing the Unthinkable: The Ethics of Using Animals in Research'. This ends with a summary and conclusions although no recommendations. The report is followed by eleven supporting essays written from disciplinary perspectives including philosophy, history and classics. The report tackles head-on the institutionalization of animal experimentation over the past 150 years, which, its editors contend, is grounded in a pre-ethical view of animals that fails to recognize the moral implications of their sentience. At one and the same time, animals are regarded as sufficiently different from humans that experiments on them are morally justifiable, but as sufficiently like humans that the experimental findings are reliably translatable into the human context, where these will save and protect human lives. The funders of animal experiments include well-known medical charities, to whom many people are ethically motivated to donate, and research councils, which are funded by taxpayers. Animals are used in military research, such as to assess the effects of bomb blasts and nerve agents, and in food safety research, for example, to understand the impacts of bacterial contamination. In medical research they are used to gain insights into the effects of drugs and alcohol on the brain and body. Physically invasive stem cell research and research into genetic modification also uses animals. A wide range of household products and their chemical constituents are tested on animals.

The report includes an informative critical discussion of the system regulating the use of animals in research (pp. 63–74). In the UK, this is overseen by the Animals in Science Committee (ASC, which in 2013 replaced the Animal Procedures Committee). Research facilities are subject to inspection, but the frequency of visits depends on resource. In the UK, figures published by the Home Office's Animals in Science Regulation Unit (ASRU), which includes around 20 inspectors granting over 3000 personal and project licences annually, indeed show a steady fall in the number of inspections. Licensing requirements may not always be met, due to factors such as seriously inadequate overnight, weekend and holiday staffing, which may be minimal even if animals are recovering from recent procedures. It might be added that other recurring issues in ASRU's annual reports include using far more animals than authorised and failures to administer appropriate pain relief. In the report the appropriateness of involving researchers and stakeholders in their own regulation is also queried. From an outsider perspective this is easy to criticize, but a workable system needs to draw on insider knowledge and competence as well as allowing robust external challenge.

Given that ASRU's annual budget is around £4 million a strong case could be made for remunerating ASC members. This would enable a wider range of qualified people to put themselves

forward to serve on the Committee than at present. Also the role and agenda of the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), which was founded in 2004 and works with ASRU, needs further strengthening. The 3Rs could be more deeply and ambitiously embedded in scientific research by expanding funding streams to support the growth of alternative methods such as adult stem cell research, replicated organs-on-chips (OoCs) and laboratory-grown human organs. Other possible measures include journals that only publish research in which animals have not been used, and new 3Rs academic posts to build capacity. In a provocative contribution, Elizabeth Tyson argues (pp. 192–9) that provision for sanctuary or retirement should be made for former research animals, of a kind that provides for their needs rather than justifies the research.

Using animals for research may be opposed on two broad grounds: first, that the findings are not reliably translatable into the human context, and second, that even if they are, such research is ethically unjustifiable. First the issue of translation. Animal reactions to products and physical treatment cannot be used to predict human responses. In the United States, the failure rate when findings from animal testing are applied to humans is well over 90% (pp. 27–8). Out of 90 HIV vaccines tested on animals, none has passed human testing (p. 30). Over 20 years, one hundred significant discoveries from animal research have led to only five commercial medical treatments (p. 154). Only 1% of stroke drugs tested on animals has become a marketable product (p. 155). Benefits appear greater than they are due to the cumulative nature of experimentation, with a single benefit requiring many discrete experiments to realize and therefore being recited and recounted in the aims of multiple projects. Poor translation and minimal social impact are due to differences between animals in their natural wild habitat and in captivity, and to the differences between animal species and the human species. Captivity alters animal behaviour through environmental factors that induce distress and encourage stereotypies. Moreover, human disease morphology cannot be replicated in its full complexity in animals. Although non-human primates (NHPs) share most of their genes with humans—chimpanzees and humans have 98% in common—differences in DNA sequencing and genetic functioning greatly complicate interspecies extrapolation (pp. 178–80). If penicillin had been tested on guinea pigs rather than on rats, it would have killed them (p. 161) by disrupting their beneficial intestinal bacteria and so might not have made it to market.

How about the basic question of whether animal research is ethically justifiable? Because proposals for research involving animals must pass ethical review, there is a tendency to regard all licensed research as ethical. However, much of what goes on could not be thus regarded according to a more rigorous definition of ethics. Animals are unable to grant or withhold consent and cannot express their interests. They are morally innocent and unable to defend themselves. Humans use animals in research only because they possess the brute power of fallen physical dominance over them. The report raises the interesting issue of the ethical implications of research animals' inability to reflect on their suffering. Because animals, the report states, 'live closer to their bodily senses than we do, the frustration of their natural freedoms may well induce more suffering than we allow. Human suffering, on the other hand, can be softened by an intellectual comprehension of the circumstances.' (p. 40) Although the ability to rationalize suffering sometimes helps humans, it also means we have a more developed sense of self and of the possibility of its annihilation, whereas animals possess less reflective understanding of mortality or of the long-term effects of injury or trauma. The most salient difference between humans and other species seems to be our capacity for moral agency based on the capacity to deliberate. This should lead us to serious consideration and debate about the ethics of research using animals.

Although the volume's scientific and philosophical engagement is impressive, its grasp of intellectual history, including in theology, could be stronger. Aristotle is presented as a precursor to Galen and modern vivisection (pp. 34–7, 104–5) without reference to his extensive observation of animals in their natural habitats and cataloguing of their normal behaviours, which contributed to his ideas about animal purpose and flourishing. Although Rosalind Hursthouse's reading of his theory of virtue as entailing compassion to animals is acknowledged in passing (p. 38), its implications are

not developed. A similarly negative portrayal is given of Immanuel Kant, and although Christine Korsgaard has argued that animals may be considered members of his moral universe (p. 36), her assessment is not allowed to shape the narrative. Thomas Aquinas is judged wanting because of his association with Aristotle and Roman Catholicism, without any recognition that he embraces Aristotle's view of teleology as extending to all species and places the whole world under the dominion not of humans but of God. In fact, Aquinas recognizes that animals possess several attributes commonly associated with reasoning, including sensory discrimination, imagination, instinct, non-sensate apprehension and memory. Moreover, by subordinating human law to natural law he shows that just because an act is legal it is not ethical. These new perspectives on Aquinas have been developed over more than a decade by scholars such as John Berkman, David Clough, Celia Deane-Drummond and Mark Wynn. Because the volume ignores important work like this in favour of judgments based on guilt by association, in which a person is found wanting because of their association with another, its strictly theological significance is limited. Dated assessments are relied on that are derived from old work. Yet theology is peculiarly well-placed to call into question the hubristic justifying narrative of animal research, that (animal) sacrifice is necessary in order to achieve ongoing progress in medical and other scientific advances against feared disease and other threats to human life and well-being.