Animals, Gender and Science: Animal Experimentation in Britain, 1947-1965

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This is for all those nonhuman animals who suffer indiscriminately each day, of every year, in scientific laboratories around the world. Maybe one day you will be free.

Abstract

Animals, Science and Gender: Animal Experimentation in Britain, 1947-1965

This thesis is an historical analysis of the *culture* of science and its use of animals in experiments by the British military and in medical scientific research, and its regulation by law, during the period 1947 to 1965. The overall aim of this thesis is to demonstrate the gendered nature of scientific experimentation on animals in mid-twentieth century Britain. To do this, it addresses two aspects of animal experimentation; firstly, exploring how scientific research forms power-knowledge relations through the use of nonhuman animals. Secondly, this thesis analyses the intersection of animal use in science with that of the broader socio-cultural context, asking was science in mid-twentieth century Britain gendered? As a consequence, it explores the *effects* of this knowledge production upon animals and women. My findings are twofold: that the construction of scientific knowledge through the use of nonhuman animals was one that created subject-object binaries, and this had powerful and detrimental consequences for nonhuman animals. Secondly, this objectification of the nonhuman had resultant power-knowledge effects that reinforced the continuation of specific kinds of scientific knowledge and its associated masculinist ontology of positivism. Consequently, the effects of these power-knowledge relations were *gendered* and had implications for (and intersections with) normative representations of women at the time.

Table of Contents

Animals, Science and Gender: Animal Experimentation in Britain, 1947-1965 3

Chapter One 7

Introduction: Accounting for the More-Than Human in History 7

Cruelty to Animals Act 9

Aims and Questions 11

Making Sociology Historical 12

Structure of Thesis 19

Limitations and Future Directions 22

A Note On Terminology 23

On Gender 24

Chapter Two 26

The Animal Rights Years: Speciesism and Utilitarianism 26

Richard Ryder and Tom Regan 28

The Sexual Politics of Meat 37

Intersectional Animal Studies 39

Questioning Animal Experimentation: Sociological Accounts 40

Historical Work 44

Broader Animal Histories 47

Science, Gender, Nature 51

Donna Haraway: Primates, Cyborgs and Dogs 55

Conclusion 60

Chapter Three 62

Aims and Questions 65

Methodological Pluralism: Playing Cat's Cradle with Donna Haraway 66

Social and Cultural History 69

Michel Foucault, Animals and Power 70

Feminism 73

Feminist Animal Studies 73

Intersectionality 74

Feminist Science Studies 77

Haraway and the Material-Semiotic 78
Documenting Experience: Digging Deep for the Animal in the Archives 80
Sources Used 81
Analysis and Interpretation 84
Periodisation 87
Historical Empathy 90
Conclusion 91
Chapter Four 92
Legal and Linear Discourses 94
Previous literature 96
The Military-Animal-Industrial Complex 99
British science and the State 100
Biological Warfare and the State 102
Secret Science and the Mysterious Case of "Operation X" 104
Power, Knowledge and Crown Immunity 106
No Peace for Animals: The Search for a Biological Weapon 109
Operation Harness 110
Operation Ozone and Operation Negation: 1954-1955 115
Power in the Making: Animal Experiments and the Production of Knowledge 119
The Infected: The Post-Mortem as an Exercise of Power Over the Nonhuman 120
The Power of Language: Animals, Gender and Biological Warfare Research 125
Coda 130
Chapter Five 132
Previous Literature 134
British Medical Science and the State 136
Hans Selye and the General Adaptation Syndrome 139
The UFAW Handbook: New Beginnings in Animal Welfare 142
Figure one: Female laboratory assistant with female rat, in Worden p. 127. 143
Laboratory Spaces and Gendered Places 143
Figure two: Cage rack design in Worden p. 24. 145
Figure three: UFAW Handbook (1957:18) 'Scheme of Animal House'. 148
'Stress Without Distress': The Scientific Basis of Kindness to Animals 152

Stress, Distress and Fear: Selye's Influence on the UFAW's Humane Experimental Technique 156
When the Distressed Animal Became the Neurotic Woman 162
Rivers of Blood: Science, Pre-Menstrual Stress and Controlling the Animal Within 163
Conclusion 171
Chapter Six 172
Previous Literature 174
The Emergence of Vivisection and Antivivisection in Nineteenth Century Britain 177
The 1876 Cruelty to Animals Act 178
'But There Dubiety Begins to Obtrude': The UFAW and Vivisection 185
The Vivisectors Call for a Review 186
'These Perverse Zoophilists': The Research Defence Society's Public Lectures 188
More Pressure to Review the Act 191
The RSPCA Deputation and the Beginnings of a Review 193
The Littlewood Inquiry 195
Anti-Vivisection Response 201
Animals, Women and the Law 209
The Power-Pain Nexus 212
Conclusion 216
Chapter Seven 217
Animal Body as Presupposed Object 218
Knowledge Production and Power Relations: The Authorising Gaze 219
Gendered Science and Knowledge Production 220
References 224
Manuscript Sources 224
The National Archives, London: 224
Home Office Registered Papers [HO 45] 224
Ministry of Defence: Chiefs of Staff Committee: Memoranda. [DEFE 5]. 224
The Wellcome Library, London: 224
Hull History Centre, Hull, East Yorkshire: 224
Films: 224

Chapter One

Introduction: Accounting for the More-Than Human in History

In July of 1958, at Lincoln College, Oxford, thirty-six leading psychiatrists, physiologists and animal experimentalists attended a four day conference on 'Stress and Psychiatric Disorder'. During the panel on the 'Disorganisation of Behaviour in Animals', a zoologist from the University of Cambridge named Robert Aubrey Hinde spoke about the nature of stress in relation to population overcrowding, declaring:

> A[n] idea of an order of priority of types of behaviour underlies the ethological approach to the homosexual, or rather pseudofemale, behaviour which is shown by some fish and birds when male behaviour is impossible. If ten-spined sticklebacks are crowded in a tank, one male becomes dominant and establishes a territory while the remaining males behave as females[1]

What Hinde was claiming was that fish, if overcrowded in a tank, would revert to female behaviour once a male dominance hierarchy was achieved. Not only that, Hinde suggested that the behaviour of both fish and birds was comparative to human behaviour. With this comparison, Hinde also noted that the homosexual person was a 'pseudofemale', whose behaviour was akin to that of a woman's. Hence, animals, women and pseudofemale homosexuals were lower in a given social hierarchy because of their very nature. Hinde implied that heterosexual male dominance was a natural and inevitable part of society. His overarching position about male and female behaviour, therefore, may indicate a position which is gendered, and was at the time a reflection of a scientific view which was more widespread. It will be my task to examine this attitude in more detail.

R. A. Hinde was a well known primatologist in post-war Britain,[2] and the quote above sets the main theme for this thesis: that there is a historical intersection between science, gender and animality, specifically, an intersection of oppression between nonhuman animals and other subjugated and marginal human groups in society. For the purposes of my research in this thesis, the treatment of animals ran parallel to discrimination towards

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[1] Robert Hinde, "Disorganisation of Behaviour in Animals: An Ethological Approach," in *Stress and Psychiatric Disorder*, ed. J. M. Tanner (Oxford: Blackwell Scientfic Publications, 1960). p.54.

[2] Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York, USA: Routledge, 1989). p124, 139, 151, pp.167-168.

women. This *gendered* entanglement of the animal and human permeated all aspects of British science and culture in the period 1947-1965. And it is this aspect of British science, namely, animal experimental science in the military, in the medical spheres, and its regulation by law, that this thesis explores.

Robert Hinde's comment about the behaviour of the stickleback, a common salt–and-freshwater fish in Britain, stood in for the behaviour of human beings in society. With male heterosexual behaviour assumed to be the epitome of being human, and passive female behaviour being the least worthy. Despite the scientific claims, Hinde is espousing a view that dates back many centuries. According to the Great Chain of Being, everything is ranked from the highest to the lowest, from the heavenly and Divine, to human then animal, and lastly inanimate objects.[3] Hinde's rationalist and humanist science posits an order of things similar to that of the theological Great Chain of Being, and as we shall see in the forthcoming chapters, despite science's claims of objectivity, and value-neutrality, this *value-laden* and *gendered* hierarchy permeated different aspects of science and society.

The period immediately following the Second World War, and running to the mid-1960s, was a time of great change in the form of government policy-making. Not only was the welfare state introduced, but also, this era was one of great technocracy. This was an era dominated by scientific experts, who took up prominent positions in government, and advised politicians and policy makers on ways to govern the populace.[4] Moreover, the immediate post-war period was sustained by a return to traditional heterosexual gender roles, emphasising the importance of the stay at home mother, housewife and male breadwinner. Even though politicians encouraged older women, to work in part-time positions, women's career prospects stagnated, despite the expansion of higher education. This expansion of higher education was mainly focused on the sciences, which disproportionately recruited males.[5]

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[3] Joanna Bourke, *What It Means to Be Human: Reflections from 1791 to Present* (London, UK: Virago Press, 2011). p.2.

[4] Jon Lawrence, "Paternalism, Class and the British Path to Modernity," in *The Peculiarities of Liberal Modernity in Imperial Britain*, ed. Simon Gunn and James Vernon (California: California Press, 2011).

[5] Helen McCarthy, "Gender Equality," in *Unequal Britain: Equalities in Britain since 1945*, ed. Pat Thane (London: Continuum UK, 2010).pp108-109.Dolly SmithWilson, "Gender: Change and Continuity," in *A Companion to Contemporary Britain 1939-2000*, ed. Paul Addison and Harriet Jones (Oxford: Blackwell Publishing Ltd, 2005).p.246.

So, R.A. Hinde's point about gendered behaviour is one that reflected the broader social context at the time, and contemporary concerns driving scientific understandings of animal and human behaviour. Science however needed test subjects. The test subjects for the new weapons and the new medical cures came in the guise of nonhuman animals. Millions of nonhuman animals were used in the period 1947-1965. Regulated by law, in the form of the 1876 Cruelty to Animals Act, the scientists of the military and medical establishments could test their hypotheses on such living beings without fear of reprisal from government authorities.

Cruelty to Animals Act

The experiments discussed in this thesis would have come under a piece of legislation entitled 'The Cruelty to Animals Act of 1876". It is worth noting the main points of that Act here, even though they are greatly expanded upon in chapter six, especially in relation to what is called the "pain condition". Nevertheless, all experiments in the period 1947-1965 were subject to regulation by law under this Act dating from the latter half of the nineteenth century.

It was in 1876 the Government introduced a Bill to prevent the infliction of cruelty on experimental animals. Following representations from the General Medical Council and other medical organisations, the Bill was amended so as to allow for the gaining of abstract knowledge and of saving life or alleviating suffering in animals as well as human beings.[6] The law states that:

> The experiment must be performed with a view to the advancement by new discovery of physiological knowledge or of knowledge which will be useful for saving or prolonging life or alleviating suffering[7]

Provision was also added requiring the scientists and the organization they worked for to hold a license, which was granted by the Secretary of State and which had to be signed for by a prominent member of the scientific community, such as The Royal Society or

[6] "Report of the Departmental Committee on Experiments on Animals," (London: Her Majesty's Stationery Office, 1965). pp.5-6.
[7] "1876 Cruelty to Animals Act." p.2.

President of the Royal Societies in London, Edinburgh or Dublin.[8] The license prevented experimenters from carrying out tests on animals without anesthetic, and to be killed after the experiment so as not suffer any 'unnecessary pain'.[9] Furthermore, Inspectors were employed, to visit institutions that conducted experiments on animals. These inspectors would observe practices including animal husbandry and the actual experiments.

Despite the imposition of these sanctions, there were still ways and means around them, especially in relation to the licensing system and the classification of types of experiment. One could be granted a license but for specific researches a certificate had to be attained. Certificates were labeled from A-F, with A being required if experiments were to be done without anesthetic, 'B' allowing for experiments to be conducted which kept the animal alive after the anesthetic had ceased. Certificate 'E', contra to the Act, allowed a scientist to perform experiments on cats and/or dogs without anesthetic, and this must be granted with certificate 'A'. Certificate 'F' was for experiments on horses and donkeys, without anesthetics and also had to be accompanied by certificate A.[10]

With any of these certificates being granted, and with a licensing system in place, it was clear that scientists were free to conduct any form of experiment whilst at the same time being seen to be regulated under the gaze of the Secretary of State. What this thesis focuses on the most in terms of the legal aspect of animal experimentation is the "Pain Condition". It is worth noting, in full, the provisos of this clause, which states:

> (a) If an animal at any time is found to be suffering pain which is either severe or is likely to endure, and if the main result of the experiment has been attained, the animal shall forthwith be painlessly killed.
> (b) If an animal at any time during any such experiment is found to be suffering severe pain which is likely to endure, such an animal shall forthwith be painlessly killed;
> (c) If an animal appears to an Inspector to be suffering considerable pain, and if such Inspector directs such an animal to be destroyed, it shall forthwith be painlessly killed.[11]

It is obvious then, that the definition of pain followed by animal experimenters was highly subjective, and the decision as to if and when an animal was in pain relied heavily

[8] "Report of the Departmental Committee on Experiments on Animals." P.6, p.222. "1876 Cruelty to Animals Act." p.4.
[9] "1876 Cruelty to Animals Act." p.2.
[10] "Report of the Departmental Committee on Experiments on Animals." pp.225-237.
[11] Ibid. p.55.

on the scientists themselves, or one of 'Her Majesty's Inspectors'. Although, as is demonstrated over the course of this thesis, the contestation of pain in the animal by the scientific profession, and government actors, was a highly subjective and dynamic phenomenon. The definition of pain shifted dramatically in mid-twentieth century Britain to encompass aspects of psychological distress. This would legitimate further, the practice of vivisection.

Aims and Questions

The overall aim of this thesis then, is to demonstrate the existence of an historical conjunction between scientific experimentation on animals and the construction of gender in Britain during the period 1947-1965. This research is an *analysis* of the *culture* of science and its use of animals in its experimental techniques in mid-twentieth century Britain. I address two aspects of animal experimentation, firstly looking at how scientific research formed *gendered* power-knowledge relations through the use of nonhuman animals, creating subject-object relations between humans and nonhuman animals. Secondly, I analyse the intersectionality of animal use in science with that of the normative assumptions of women in this era, and consequently, explore the *effects* of this knowledge production onto animals and women. The research questions guiding this work are discussed towards the end of this section; firstly, we need to turn to one aspect of sociology that is not necessarily treated as mainstream in the discipline, that of Historical Sociology.

My work runs parallel to the scholarship of various ecofeminists and feminist historians of science. Most notably, Carolyn Merchant, Evelyn Fox-Keller, Donna Haraway, Ludmila Jordanova and Londa Schiebinger.[12] The research by these academics are covered in chapter two, in the Literature Review. Therefore, my thesis uncovers the

[12] Londa Schiebinger, *The Mind Has No Sex? Women in the Origins of Modern Science* (Cambridge MA: Harvard Universtiy Press, 1989), Londa Schiebinger, *Nature's Body: Gender in the Making of Modern Science* (Boston, MA: Beacon Press Books: 1993), Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution* (New York: Harper & Row Publishers Inc., 1983), Carolyn Merchant, *Reinventing Eden: The Fate of Nature in Western Culture* (Oxon UK: Routledge, 2004), Evelyn Fox-Keller, *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science* (London: : Routledge, 1992), Evelyn Fox-Keller, *Reflections on Gender and Science* (New Haven: Yale University Press, 1985), Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Donna Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (London: Free Association Books, 1991), Ludmilla Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries* (Wisconsin: The University of Wisonsin Press, 1989).

gendered nature of this previously described feminist critique of science, using the above mentioned to inform and inspire the historiographical and methodological standpoint of the thesis (see chapters two-three).

Making Sociology Historical

By doing this research, I hope to provide a useful link between (historical) sociology, gender studies and the newly emerging area of animal studies. It is no surprise then, that the research embraces methodological pluralism and interdisciplinarity, as it does not fit neatly within the confines of sociology. However, this does not matter, as historically, animals have been seen as marginal and insignificant to the study of sociology.[13] Moreover the very definition of sociology, according to well-known scholars John Macionis and Ken Plummer, is 'the systematic study of *human* society'.[14] What this statement implies, is that animals (in the conventional sense of the term) are automatically excluded from the domain of the human life and therefore neglected as one of the "subjects" of sociology.

This thesis hopes to address this neglect of the nonhuman animal in sociology by locating it within the purview of *historical sociology*. Historical sociology analyses the development of societies and their attendant apparatuses of power over time. According to historical sociologist Richard Lachmann, sociology was originally an historical discipline, as its principal founders, Marx, Durkheim and Weber, were able to understand contemporary society through an analysis of the past.[15] The cultural historian Peter Burke concurs, and argues that the two disciplines are complementary:

> Historians and sociologists have not always been the best of neighbours. Intellectual neighbours they certainly are, in the sense that practitioners of both disciplines are concerned with society viewed as a whole and with the whole range of human behaviour… Sociology may be defined as the study of human society, with an emphasis on generalisations about its structure and development. History is better defined as the study of human societies in the plural, placing emphasis on differences between them and also on the changes which have taken

[13] Kay Peggs, *Animals and Sociology* (Hampshire: Palgrave MacMillan, 2012). p.1.
[14] John Macionis and Ken Plummer, *Sociology: A Global Introduction*, 5 ed. (London Prentice Hall, 2011). p.4. [my italics].
[15] Richard Lachmann, *What Is Historical Sociology?* (Cambridge: Polity Press: 2013). p.1.

> place in each one over time. The two approaches have sometimes been viewed as contradictory, but it is more useful to treat them as complementary.[16]

Burke calls for historians to use the social theory of sociologists to inform their work, and like Lachmann, states that sociology was once historical, again, making reference to Marx, Durkheim and Weber.[17] Yet, there is one problem with these definitions of historical sociology: they are all anthropocentric. To be anthropocentric is to centre research on and for the human, neglecting the nonhuman animal and their contributions to the making of society. Like Marcionis and Plummer's definition of sociology, the human has been the focus of historical studies for a very long time. I, on the other hand, hope to carve a space out for the nonhuman in history, and add to the burgeoning animal histories, which have emerged over the past decade.[18] To do this I have taken the advice from leading animal historian and literary scholar, Erica Fudge, who writes:

> In the history of animals, to question the anthropocentric view of the world – to brush history against the grain – is to challenge the status of the human, which in turn is to throw all sorts of assumptions into question. If we can no longer assume our own status then we can no longer take the status of animals as given. What was assumed to be natural – human dominion – is revealed instead to be manufactured, that is, ideological. Through anthropocentrism – the recognition that the only vision is the human vision, the only history a human history – we can in fact work against anthropocentrism, make it untenable.[19]

In other words, Fudge is arguing for animal histories to be written *against* the human. This thesis hopes to do this, by addressing several neglected aspects of historical study; firstly, with its focus on the nonhuman animal, and arguing for their centrality in the construction of historical knowledge as much as the human is. Secondly its intersectional and feminist approach, and thirdly, its emphasis on the historical relationships between human-animals in the laboratory.

Yet it is worthy of note that the writing of animal history is not a new endeavour and dates back to the late 1980s with the work of Harriet Ritvo, closely followed by Hilda Kean and Erica Fudge (see chapter three). This research fits into the broader scholarship of animal histories, especially in relation to the work of Harriet Ritvo, Hilda Kean and

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[16] Peter Burke, *History and Social Theory* (Cambridge: Polity, 1992). p.2.
[17] Ibid. pp.10-14.
[18] Hilda Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?," *Anthrozoös* 25, no. Supplement (2012). p.S57.
[19] Erica Fudge, "A Left-Handed Blow: Writing the History of Animals," in *Representing Animals*, ed. Nigel Rothfels (Bloomington, USA: Indiania University Press, 2002). p.14.

Erica Fudge. However, I am positioning it in terms of looking at the sometimes complex and messy entanglements between humans and animals in the context of scientific animal experimentation.

Furthermore, within the animal history paradigm, this thesis has moved on from the idea of evidencing animal agency, to one where the research 'use[es] agency as a starting point and map[s] the varied economic, political, social and cultural contexts in which animals are embedded'.[20] Therefore, the conscious boundaries of the thesis recognise the importance of animal agency but within the broader social and cultural context unto which this history serves. Joshua Specht argues for this and states:

> It seems clear that animals have some form of agency, that is, the ability to shape in meaningful ways the world around them. But instead of cataloguing instances of agency, historians would be better served developing a more nuanced understanding of how autonomous action operates within and is constrained by surrounding structures. If this is true of humans, it is especially true of animals, which are so often at the mercy of human needs. Animal historians would be well served to treat agency as their starting point of their analysis and lay aside the jargon of agency. Agency should always be the start of the analysis, rather than the conclusion of the argument.[21]

To do this type of animal history then, I have three main research questions to answer, beginning with: how is it that in science the nonhuman body is objectified, and how, as a result of this, does the animal body *as object* presuppose them as being useful for animal experiments? What kinds of knowledge does laboratory animal science produce, under what circumstances and methodologies, and how does this link to the exercise of power both within and without the laboratory? Is the production of scientific knowledge through the use of animals gendered and what are the effects of such knowledge production? These research questions will be discussed in more detail in chapter three where I address methodological issues in the writing of animal histories.

Gender and Science: Is Science Inherently Masculine?

As has been discussed, this thesis is an extension of the work of many ecofeminists and feminist science studies scholars who have argued that science, in its prinicples and practices, is inherently gendered. It is important then, to outline here, the general critique

[20] Joshua Specht, "Animal History after Its Triumph: Unexpected Animals, Evolutionary Approaches, and the Animal Lens," *History Compass* 14, no. 7 (2016). p.332.
[21] Ibid. p.332.

of science, lead by leading scholars Thomas Kuhn and Paul Feyerabend. Then, moving on to the feminist critique which had informed to this thesis.

Science is Social and Cultural

Scientific knowledge rests on the idea of objective nature, external to our own field of perception and hence, our own social and cultural life. Nature then, rests in this domain of the objective and in order to study 'it' specific methodological steps have to be taken in order to render distinct fact from fiction, truth from myth. The detached knowers (scientists) can only directly observe this external nature through observations and the use of mathematical concepts which fall directly under the idea of the scientific experiment. [22] This notion of science depends on the assumption that through mathematical conceptualisation of objective nature, we can directly know and understand the world as it is, free from the bias of social and cultural values.

Yet, this epistemology, despite its claims of objectivity and neutrality has over the last quarter of a century or more come under increasing scrutiny.[23] None-more-so than for its epistemological incoherence in terms of its reliance on claimed theory-neutral observations and its assertion of it being asocial. As Will Wright states, we need to:

> Investigate scientific knowledge as a legitimating belief system, a belief system that is inherently legitimating and thus the validity of which, as knowledge, is an issue of social life, not strictly of esoteric epistemological issues. From this perspective scientific knowledge could be coherently and legitimately criticised in terms of its social and ecological effects.[24]

Scientific knowledge, as I argue, has lost its legitimating principle of value neutrality, rather, following Wright, science is social *and* cultural. Science legitimates certain social practices as well has containing certain cultural norms and values in its very practices.[25]And, it is this cultural critique of science which I draw upon in this thesis.

[22] Will Wright, *Wild Knowledge: Science, Language and Social Life in a Fragile Environment* (Minneapolis: Minnesota Press, 1992). p. 24.
[23] Ibid. p.27.
[24] Ibid.p.41.
[25] Ibid. p.43.

This was first brought to light by Thomas Kuhn in his book *The Structure of Scientific Revolutions.*[26] In this text Kuhn did an historical investigation to undermine the prevailing views about science as involving a progressive accumulation of objective knowledge towards a universal truth.[27] Rather, for Kuhn, science is a series of historical changes with ever shifting rules and theories, which once agreement has been reached in the scientific community, this sets the basis for future research within the disciplines. Kuhn calls this a 'paradigm', and research is subsequently carried out under the auspices of this school of thought.[28] The notion of paradigm is central to his model of science and helps to demonstrate how science is a social and cultural endeavour. For Kuhn, the key point is that within a particular area of science there will be a shared set of theoretical assumptions, a commonly accepted view on the nature of reality (ontology), and an accepted methodology for evaluating research, all which provide rules for future practice:[29]

> Scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of community paradigms. The coherence displayed by the research tradition in which they participate may not imply even the existence of an underlying body of rules and assumptions that additional historical or philosophical investigation might uncover. The scientists do not ask or debate what makes a particular problem or solution legitimate tempts us to suppose that, at least intuitively, they know the answer. Paradigms may be prior to, more binding, and more complete than any set of rules for research that could be unequivocally abstracted from them.[30]

In other words, Kuhn's paradigms form the basis of an understanding of science that is cultural and has its own unconscious and unspoken set of norms and values which 'the scientists do not ask or debate' about. If we take cultural studies scholar, Raymond Williams' suggestion of culture as being the unspoken acceptance of 'activities, relationships and [social] processes' within a particular society at a given time and place.[31] Then we can combine this with Kuhn's view on paradigms, to suggest that specific norms, values, expected behaviours, and research endeavours are endemic to the disciplines of science, which in turn create a culture of science.

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[26] Thomas Kuhn, *The Structure of Scientific Revolutions*, 4 ed. (London: The University of Chicago Press Ltd, 2012).
[27] Ibid.
[28] Ibid. pp43-45.
[29] Ibid. p.46-50.
[30] Ibid. p.45.
[31] Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, 3 ed. (London: HarperCollins, 1988). p.92.

Furthermore, the self-styled anarchist, Paul Feyerabend argues along similar lines in terms of the relativist nature of science and its inherent social and cultural values, arguing:

> Science has no greater authority than any other form of life. Its aims are certainly not more important than are the aims that guide the lives in a religious community or tribe that is united by a myth. At any rate they have no business restricting the lives, the thoughts, the education of the members of a free society where everyone should have a chance to make up his own mind and to live in accordance with the social beliefs he finds most acceptable. The separation between church and state must therefore be complemented by the separation between state and science.[32]

So, for Feyerabend, there are no methodological principles that distinguish science from non-science, and so no reason to hold science in a superior position to those other forms of understandings of the world such as religions and tribal communities. Hence, science's privileged position through its self-styled declarations of objective neutrality have come under increasing scrutiny, with the identification of the subjective and epistemologically flawed nature of its research.

After Kuhn and Feyeraband's critiques of science as being replete with social values, in the 1980s, space opened up for a feminist critique of science. And it is this critique which informs my thesis and unto which I provide evidence in support of. For feminists, science is inherently masculine, its observations of the world are built on patriarchal assumptions stemming from the work of early pioneers of the scientific method, most notably, Francis Bacon and René Descartes.[33]

The feminist critique of science operates on two levels, firstly, emphasising the exclusion of women from science and analysing how this exclusion took place.[34] They held the view that not only were women excluded from science but, when present, held ancillary and supporting roles (see chapter five in support of this). But, and in line with the basic premise of this thesis, at its most fundamental level, the feminist critique of science can be seen as one which identifies the whole project of an objective knowledge of nature

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[32] Paul Feyerabend, *Against Method*, 4 ed. (London: Verso, 2010).p.299.
[33] Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*.
[34] Sandra Harding, *The Science Question in Feminism* (Ithaca, USA: Cornell University Press, 1986), Hilary Rose, *Love, Power and Knowledge: Towards a Feminist Transformation of the Science* (Cambridge: Polity Press, 1994).

(and hence, nonhuman animals) as inseparable from a white Western masculine desire to dominate nature, women and racial 'others' (see especially chapter four for this).[35] As Hilary Rose states:

> The trouble with science and technology from a feminist perspective is that they are integral not only to the systems of domination of late capitalism and its new forms of imperialism, but also to one of patriarchal domination; yet to try and discuss science under these structures of domination or to argue that they constitute one social formation has proved difficult.[36]

This thesis hopes to add to the burgeoning evidence around the feminist critique of science, as Rose rightly asserts 'such racializing and gendering of science was not confined to the eighteenth and nineteenth centuries but is present today, despite the ideological claims of the neutrality of science'.[37] And it is the science of mid-twentieth century Britain which I hope will add to this feminist analysis of science and its attributes.

The influential work by the ecofeminist Carolyn Merchant (see chapter two for literature review), established connections between the medieval practice of witch-hunting and male challenges to female roles (in midwifery especially), and the shift away from an holistic and feminine vision of the world to the impersonal, mechanical philosophy of a science proposed in the seventeenth century.

Evelyn Fox-Keller furthers this work and explores the gendered and sexual metaphors by which the scientific revolution justified itself. Kellar's argument is that wider social and cultural changes in gender relations contributed to the formation of a new masculine ideology and thus, influenced the practice of science.[38] Further, the growing authority of science fell in line with masculine virtues which, she argues, contributed to the reformation of new gender divisions in wider society. Kellar uses psychoanalysis (Object Relations Theory) to expose science's enfolding of masculine values, and the association of masculinity with the domination of nature as 'other' are explained in terms of the

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[35] Rose, *Love, Power and Knowledge: Towards a Feminist Transformation of the Science*, Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, Fox-Keller, *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science*, Fox-Keller, *Reflections on Gender and Science*, Evelyn Fox-Keller, "Language and Ideology in Evolutionary Theory: Reading Cultural Norms into Natural Law," in *Feminism and Science*, ed. Evelyn Fox-Keller and Helen E. Longino (Oxford: Oxford University Press, 1999).
[36] Rose, *Love, Power and Knowledge: Towards a Feminist Transformation of the Science.* p.4.
[37] Ibid. p.17.
[38] Fox-Keller, *Reflections on Gender and Science.*

unconscious. However, Kellar hopes to transform science not completely abandon this domain of exploration by reclaiming:

> From within science of science a human instead of a masculine project, and the renunciation of the division of emotional and intellectual labour that maintains science as a male preserve.[39]

The idea for Kellar, is to create a science that embodies the themes of respect and love for nature, and the recognition of complexity in the world around us. This is widely shared by other feminists (used in thesis), and these particular concerns are acutely present when they intersect with compassion for the suffering of animals as the subject of research. Lynda Birke (see chapter two) has explored these interconnections between masculine training in the scientific methods and the repression of compassion to the suffering of animals. Donna Haraway has also addressed the woman, human, animal and science issues which are evidenced in this work (see chapters two and three for Donna Haraway's dominant influence on this thesis).[40]

Structure of Thesis

The work is divided into seven chapters, three of which are empirical and based on my primary research. Chapter two outlines the broader literature in relation to this area of research. This broad overview aims to demonstrates the specific areas of influence and also highlight the larger gaps in existing knowledge. The chapter covers four main areas, firstly, the work of Peter Singer and his ground-breaking book on the rights of animals. Peter Singer is considered to be one of the main protagonists of the animal rights movement of the 1970s, and his work continues to influence scholars and activists alike today. Following this, the (seen to be) founder of animal studies Jacques Derrida and his paper 'The Animal That Therefore I am (More To Follow)' will be critically analysed by using the work of Susan Fraiman, who argues that despite Derrida's status as the "founding father" of animal studies in the humanities and social science, his work comes after a wealth of ecofeminist and feminist animal studies scholars' research.[41] The credit

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[39] Ibid.p.178.
[40] Lynda Birke, *Feminism, Animals and Science: The Naming of the Shrew* (Buckingham, UK: Open University Press, 1994), Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science.*
[41] Susan Fraiman, "Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies," *Critical Inquiry* 39, no. 1 (2012).

for the 'animal turn' in the humanities is misplaced onto Derrida to the detriment of the wealth of important work done prior, and subsequently, to, him by ecofeminists. The second section of the literature review will look at the work of ecofeminists and feminist animal studies scholars, with a particular focus on Carol J. Adams and her book *The Sexual Politics of Meat*.[42] Then sociological studies of research into animal experimentation will be reviewed, and finally historical work concerning the history of science and gender is appraised, followed by the research of Donna Haraway.

Chapter three is the methodology; here I advocate a pluralistic approach to the research and writing of nonhuman histories. Using Donna Haraway's notion of research design being a 'Cat's Cradle' of knotty and entangled relations between different paradigms, I argue that methodology is as much about the epistemology of research as it is about technique.[43] This "cat's cradle" of a methodology draws on the approaches of social and cultural histories including the Foucauldian concepts of knowledge, power and discourse; feminist animal studies in the guise of the conceptual apparatus of intersectionality and feminist science studies, most notably the material-semiotic epistemology of Haraway. I discuss these methodological and conceptual underpinnings to the thesis, followed by an explanation of the primary sources drawn on. I have used a variety of primary sources to explore narratives of animal experimentation; archival documents from The National Archives and The Wellcome Library in London as well as documents from Hull History Centre, coupled with books and journal articles of the time.

Chapter four is the first of the three empirical chapters and focuses on Britain's testing of biological weapons in various parts of the world during the late 1940s to the mid-1950s. In this chapter I argue that the use of animals in biological warfare trials contributed to the development of Britain's military-*animal*-industrial-complex, which extends the work of Barbara Noske and her notion of the animal-industrial-complex. First used by Noske to describe the often opaque and mutually reinforcing networks of political and economic relations between the state and other powerful political actors. Noske described how these networks had implications for the animal, in relation to

[42] Carol Adams, *The Sexual Politics of Meat* (Oxford, UK: Polity Press, 1990).
[43] Donna Haraway, "A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies," *Configurations* 2, no. 1 (1994).

contemporary agricultural-industrial relations.[44] The military-animal-industrial complex is a term used by leading Critical Animal Scholars to denote the use of animals in warfare, and in my example, in the production of biological weapons of mass destruction. This chapter aims to uncover these power relations between the nonhuman animal and the human military scientist between the years 1947-1955. Furthermore, I outline and discuss the role of post-mortem examinations of the nonhuman body in reinforcing power relations between the human and animal. I end this chapter with a discussion on *how* and *why* this growth of the military-animal-industrial complex extended to the broader social and cultural context of the time in relation to gender.

This discussion on the gendering of science and its "objects" of study extends to chapter five where I focus on the relationship between the psychopathological discourses of stress and the emergence of laboratory animal welfare. I argue that during this period members of the scientific community modified their views about the nonhuman as a 'passive object' of manipulation, to one of an 'active object'. This indicated an internalisation of discourses of 'care' towards nonhumans under experiment. Scientists still bestowed upon nonhuman animals Cartesian principles - still soulless mechanisms. However, with recourse to Hans Selye's idea of 'stress', scientists in medical research began to advocate a 'humane' approach to the treatment of laboratory animals, which is still present in British law today in the guise of the three 'R's' (Reduction, Replacement, Refinement). Medical researchers re-shaped laboratory animal relations in two ways; via the very material spaces of the laboratory, and methodologically, through the very procedures used to test ideas about medical cures. The chapter ends with insights drawn from feminist science studies, to indicate that the treatment of the nonhuman in scientific culture intersected with the broader social context concerning issues of gender, especially epistemological claims about women and mental illness.

With the two main areas of British scientific animal use having been discussed in the preceding chapters, chapter six explains the legal consequences of animal experimentation in Britain. Despite many scholars of animal rights law noting how mid-twentieth century Britain was a time when antivivisection movements stagnated, I argue

[44] Barbara Noske, *Beyond Boundaries: Humans and Animals* (London, New York and Montréal: Black Rose Books, 1997).

the opposite.[45] In the early 1960s, due to pressure from a variety of antivivisection organisations, the British Union for the Abolition of Vivisection and the RSPCA being just two of these groups, the Home Secretary called for a review of the 1876 Cruelty to Animals Act, a law that regulated the practice of animal experimentation, and meant that scientists and their places of employment had to be licensed in order to carry out these experiments. The focus of this chapter is on the analysis of the construction of, and concentration upon, the renaming of certain typologies of vivisection. This is with particular reference to the legal definition of "pain" in the nonhuman as constructed by scientists and which I call the 'Power-Pain Nexus'.

The Power-Pain Nexus draws on the Foucauldian idea of power-knowledge relations. Power and knowledge are intimately linked in this instance, in order to render nonhuman animals discrete from human animals. Consequently, this de-subjectification, through discourse, is constructed from a series of networked relations between scientists, government and legal actors, which signifies overall power and control over the experimental animal. Particularly, dictating terms, and definitions of the very subjective experience of pain. This concept is then evoked in relation to the gendered experience of pain, whereby insights from feminist animal studies scholars are used to articulate the gendered dimensions of law in relation to animal experimentation.

The thesis ends with a concluding chapter, drawing together all aspects of the research and answering the research questions posed in the methodology chapter.

Limitations and Future Directions

This thesis has examined a relatively short period of time, the years 1948-1965, and a particular place, Britain. It has adopted a novel approach to the history of science by highlighting the experiences of animals in the scientific process. Furthermore, it has taken an intersectional approach to address the overlapping and entangled discourses surrounding the use of nonhuman animals in science and its resultant knowledge claims, and situated these in relation to gender. But much more could be researched and

[45]See for example Richard Ryder, *Victims of Science: The Use of Animals in Research* (London, UK: National Anti-Vivisection Society, 1983). Ryder is also discussed in more detail in chapter six.

analysed. What has become clear during the writing of this thesis is that there is no single overlapping intersectional dimension to animal experimentation; rather there is a matrix of possibilities regarding the intersections of animals, gender, *race* and *social class*. This was evidenced in the chapter on Porton Down and their sea trials in the Caribbean, why did the establishment choose to conduct trials there? Surely the weather was not the only factor; perhaps the colonial dimension of Britain and the conditions of its access to land played a part in the decision? And with regards to social class, the laboratory was a "hot house" of gender *and* class relations, with the majority of technical staff being women (as stated in chapter five) and 'uneducated' men (as stated in chapter six). These aspects need to be further explored and analysed in order for a fuller appreciation of the intersectional approach to human-animal studies to be demonstrated.

Another limitation was the neglect of the analysis of more cultural texts in the history of animals, science and gender. What I mean by this is an exploration into the literature and journalistic accounts of both science, animal experimentation and women's experiences of medical, military and judicial practices in mid-twentieth century Britain. It was the early 1960s that the second wave feminist movement really began, but the movement did not gain momentum and public attention until the late 1960s. Despite this, a broader history of animals, gender and science might take into account the cultural and social impact of women writers of the period, such a Viola Klein, Simone De Beauvoir and Betty Friedan, or the narratives of animal experimentation that circulated in contemporary newspapers. So too could the historical period which this study focused upon be extended. I purposely chose this period as it was immediately after the Second World War and prior to the 'Rights' movements of the late 1960s and 1970s. A more thorough historical study might extend the research into the 1970s to discuss the emergence of the animal's and women's rights movements and how this affected scientific research and its knowledge claims.

A Note On Terminology

For most of this thesis I use the word animal to designate the more-than-human being. I acknowledge that this is a huge generalization, which eschews subjectivity of sentience, and places nonhuman animals, in all their individuality, into the very binary modes which

this thesis tries to address and overcome. I am, however, using the historical referential 'animal' by using language that was used in the archival documents.

Nonhuman animals have been generalised for the most part, with specific species being discussed in relation to the particular experiment in the narrative. Despite this, I take stock from Derrida, in his paper '*The Animal That Therefore I Am (More To Follow)',* who examines "the animal" with particular reference to his cat (reviewed in chapter two), but also acknowledges the singularity of species:

> If I say "it is a real cat" that sees me naked this is in order to mark its unsubstitutable singularity. When it responds in its name, it doesn't do so as the exemplar of a species called "cat", even less so of an "animal" genus or kingdom. It is true that I identify it as a male or female cat. But even before that identification, it comes to me as *this* irreplaceable living being that one day enters my space, into this place where it can encounter me, see me, even see me naked. Nothing can ever rob me of the certainty that what we have here is an existence that refuses to be conceptualised.[46]

I too, acknowledge this 'unsubstitutable singularity', but for historical purposes, to avoid anachronism, I use the term "animal" in places.

On Gender

As this thesis addresses the intersectional nature of animals, science and gender, it is also pertinent to discuss what I mean when I refer to gender. Here, I use Judith Butler's idea of the performativity of gender, to suggest that one's learned performance of gendered behavior (masculine or feminine) is something we act out, a performance.[47] This is imposed upon us by normative heterosexual standards (also, as I later argue through the construction of scientific knowledge via the use of nonhuman animals in experiments).

Butler argues that gender is not a natural "thing" and therefore does not exist, she writes 'gender reality is performative which means, quite simply, that it is real only to the extent

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[46] Jacques Derrida, *The Animal That Therefore I Am*, ed. John Caputo (New York: Fordham University Press, 2008). p.9.
[47] Judith Butler, "Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory," in *Performing Feminisms: Feminist Critical Theory and Theatre*, ed. Sue-Ellen Case (Baltimore: Johns Hopkins University Press, 1990). p270.

that it is performed'.[48] I take Butler's idea of gender, as one that is a social construction, open to change and contestation.

> Because there is neither an 'essence' that gender expresses or externalizes nor an objective ideal to which gender aspires; because gender is not a fact, the various acts of gender creates the idea of gender, and without those acts, there would be no gender at all. Gender is, thus, a construction that regularly conceals its genesis.[49]

Moreover, there is no dividing line taken between sex and gender, but rather, following Butler, I assume that our gendered performances affect people in material, corporeal ways, which in turn are affected by social constructions. Following Butler, I take the idea of sex not as 'a bodily given on which the construct of gender is artificially imposed, but…a cultural norm which governs the materialization of bodies'.[50] Rather than embrace radical constructivism, it is important to note how materialization of bodies (human and nonhuman) happens through discourse and social conventions. This involves a consideration of materiality and involves a turn to 'matter, not as a site or surface, but as *a process of materialization that stabilizes over time to produce the effect of boundary, fixity, and surface we call matter*.'[51]

[48] Ibid. p.278.
[49] Ibid. p.273.
[50] Judith Butler, *Bodies That Matter*, 2nd ed. (Oxon, UK: Routledge, 2011). pp.2-3.
[51] Ibid.p.xviii

Chapter Two
Literature Review

Despite covering the major literature of each topic area in the forthcoming chapters (chapters four to six), it is still important to outline and discuss the broader literature of animal studies. I have taken a selection of work relevant to this thesis to discuss, from feminist animal studies/ecofeminism, scientific and natural histories to contemporary animal studies (sociological informed accounts of animal experimentation), including the highly influential work of Donna Haraway. It is these areas of research, and scholars, which have influenced the writing of this thesis and played an important role in defining and focussing my topic for this research.

Firstly, however, one must turn to the work of Peter Singer, one of the first scholars to argue for the rights of nonhuman 'Others'. Then we turn to the work of Jacques Derrida, whose writings many animal studies scholars view as the foundational texts of the discipline. The following section will be focused on the feminist animal studies/ecofeminist literature, and then we turn to the work of those scholars who have researched animal experimentation from a sociological perspective. The final section is a broad overview on historical work related to my thesis, and this includes a review of the major works of Donna Haraway.

The Animal Rights Years: Speciesism and Utilitarianism

It was in 1975 that Peter Singer's book *Animal Liberation* first hit the shelves and caused a stir amongst the general public.[52] The book by Singer is considered to be one of the key texts of the late twentieth century, and a book which signified the emergence of the animal rights movement. The book's premise is to advocate for a moral consideration towards the treatment of animals in contemporary society.

Singer argues that the moral treatment of animals, in every area of social life, from the farm, to the factory and the laboratory, is deeply and systematically immoral. He argues for a complete and radical revolution in the way we deal with other nonhuman species. Despite not coining the term, he describes this discriminatory treatment towards animals

[52] Peter Singer, *Animal Liberation*, 3rd ed. (London: Pimlico, 1975).

as speciesism. Richard Ryder first used the word to describe the use of animals in experiments and the discriminatory practices associated with it, Singer extends the term and has subsequently become synonymous with *Animal Liberation*.[53]

Singer's moral philosophy concerning the treatment of nonhuman animals is based on the principles of utilitarianism. By expanding the work of Jeremy Bentham, Singer's utilitarianism is expanded to the nonhuman domain, and is based on the idea that pleasure is good and pain is bad. With regards to nonhuman animals, Singer advocates the view that animals can suffer pain and experience pleasure and therefore should encounter some moral consideration from human beings. Singer argues that the preference for increased pleasure applies to all living beings regardless of who you are, and he calls this the principle of equality. The principle refers to equal consideration of interests and preferences.[54] For Singer, all beings that can experience pain have this utilitarian impulse to avoid it, and he asserts this as the foundation of all morality:

> If a being suffers there can be no moral justification for refusing to take that suffering into consideration. No matter what the nature of the being, the principle of equality requires that its suffering – insofar as rough comparisons can be made – if any other being. If a being is not capable of suffering, or of experiencing enjoyment or happiness, there is nothing to be taken into account. So the limit of sentience for the capacity to suffer and/or experience enjoyment is the only defensible boundary of concern for the interests of others. To mark this boundary by some other characteristic like intelligence or rationality would be to mark it in an arbitrary manner. Why not choose some other characteristic, like skin colour?[55]

Singer's moral consideration towards animals and his denigration of speciesism is expounded in the book, which covers all forms of animal use including agriculture and experimentation. The writing is underpinned by an advocacy of vegetarian values, and encapsulates a philosophical discussion on the historical construction of human domination over animals. Yet, his utilitarianism is questionable, as to rely on the calculability of pain and pleasure is a tricky subjective measure and could in fact lead to greater human and animal suffering.[56] This is because, despite his appreciation for the links between sexism, racism and speciesism in terms of the treatment of living beings, Singer still seems to implicitly condone a human-animal hierarchy of being which would

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[53] Ryder, *Victims of Science: The Use of Animals in Research*.
[54] Singer, *Animal Liberation*. p.5.
[55] Ibid. pp.8-9.
[56] Bourke, *What It Means to Be Human: Reflections from 1791 to Present*. p.120.

ultimately lead to those seen as lower in the hierarchy being more suitable for sacrifice for "the greater good". This is undoubtedly unintentional, but can be analysed through his advocacy of utilitarian principles.[57]

Even more so, his chapter on vivisection demonstrates the experiences of animals in the laboratory, with specific reference made to psychological experiments such as Harry Harlow's maternal deprivation studies.[58] Singer moralises about experimental animals and their suffering, but in the end, guided by his utilitarian principles, refuses to repudiate the infliction of suffering on experimental animals if it benefits human health and welfare, declaring 'no doubt there have been some advances in knowledge which would not have been attained as easily without using animals'.[59] At which point he turns to the historical and lists examples from as far back as William Harvey's work on the circulation of blood (eighteenth century), and Banting and Best's discovery of insulin, plus many more.

However, he fails to successfully historically analyse these medical pioneers. For instance, Alexander Fleming's discovery of penicillin was first tested on rabbits; this did not work so he put the drug to one side believing it to be ineffective.[60] Nor can one really compare the science of today to the scientific context that Harvey was working in.[61] Singer's work was ground-breaking in the 1970s and provided a space for the emergence of the animal right's movement. But one must consider Singer's work now within historical context rather than use it ahistorically.

Richard Ryder and Tom Regan

Despite Singer's popular association with the development of the word 'speciesism', it was in fact Richard Ryder who coined the term, and which first appeared in his book *Victims of Science: The Use of Animals in Research*.[62] This book gave an in-depth overview of animal experiments in the laboratory, starting with a chapter on speciesism and its definition:

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[57] Singer, *Animal Liberation*. pp.2-6.
[58] Ibid. pp30-34.
[59] Ibid. p.91.
[60] Ray Greek and Jean Single-Greek, *Specious Science: How Genetics and Evolution Reveal Why Medical Research on Animals Harms Humans* (London: The Continuum International Pulbishing Group Ltd, 2002). p.26.
[61] Ibid.
[62] Ryder, *Victims of Science: The Use of Animals in Research*.

> I use the word 'speciesism' to describe the widespread discrimination that is practiced by man against the other species, and to draw a parallel with racism. Speciesism and racism are both forms of prejudice that are based upon appearances – if the other individual looks different then he is rated as being beyond the moral pale. Racism is today condemned by most intelligent and compassionate people and it seems only logical that such people should extend their concern for other races to other species also. Speciesism and racism (and indeed sexism) overlook or underestimate the similarities between the discriminator and those discriminated against and both forms of prejudice show a selfish disregard for the interests of others and their sufferings.[63]

This definition, like Singer's makes a distinct analogy between the treatment of animals and the treatment of people according to their race and gender. Not necessarily acknowledging the convergent treatment of certain groups of people and animals (this work was written prior to the feminist notion of intersectionality), but definitely using speciesism as analogous to racism and sexism.

The book, like Singer's, was one based on a moral philosophy of animal rights, which eschewed the emotional and upheld the rational. Other chapters in the book included discussions on non-medical research, a specific chapter on primates, legislation and a chapter devoted to a call for legal reform. Of particular importance to this research and Ryder's future work, were his musings on pain and the felt experience of suffering in laboratory animals.[64] His writings on pain fall between the utilitarianism of Singer and the Kantian inspired philosophy of Tom Regan, who posited that ethics are rule based, and the moral treatment of animals depends on the normative rules that govern a particular society's behaviour (more on Regan below).

For Ryder, all beings who feel pain have an inherent right not to experience suffering, as all living beings have an inherent value. Taking a utilitarian view, he writes '…all painful events are bad and all bad events are painful. The only possible justification for evil is that it brings greater good, and the only justification for pain is that is creates a greater pleasure – a greater joy or happiness'.[65] Yet, he adds another dimension to this utilitarian moral principle, he adds the idea of subjectivity and phenomenology of experience 'I believe that the only reality that we can be sure of is the universe of our own

[63] Ibid. p.5.
[64] Ibid. pp.8-11. Richard Ryder, *Painism: A Modern Morality* (London: Centaur Press, 2004).
[65] Ryder, *Victims of Science: The Use of Animals in Research*. pp.8-9.

awareness'.[66] This embracing of subjectivity by Ryder, was not necessarily a rejection of a stark masculine viewpoint on the rights of animals, but rather still upheld by utilitarian principles, but ones that were inherently conservative and individualistic, he asserts:

> If pain forced upon the individual is to be justified convincingly, it must be in terms of the benefits accruing to the same individual. Of course some individuals may suffer and others gain by it. Such occasions arise daily. But to jump from the sphere of consciousness of one individual to that of another individual is literally to leap from one universe to another. Benefits justifying pain can only be benefits if they occur within the same sphere of consciousness, that is to say, within the same individual organism.[67]

This solipsism abjures any notion of being able to understand nonhuman animals through a collective political effort, which if were case, would threaten the Status Quo. Ryder instead embraces an individualistic utilitarianism that in the end neglects issues of power and prevents an exploration into the categorical imperative of 'human and animal'.

After Singer and Ryder came Tom Regan, in 1981 and his book *The Case for Animal Rights*,.[68] Regan's book moves away from the utilitarianism of Singer and Ryder and embraces the Kantian idea of deontological ethics and Natural Rights Theory.[69] This ethical position is based on the person being duty bound, or abiding by a set of rules, as Regan avers:

> The basic moral right to respectful treatment places strict limits on how subjects-of-a-life may be treated. Individuals who possess this right are never to be treated as if they exist as resources for others; in particular, harms intentionally done to any one subject cannot be justified by aggregating benefits derived by others. In this respect, my position is anti-utilitarian, a theory in the Kantian…tradition. But the rights view parts company with Kant when it comes to specifying who should be treated with respect. For Kant, only moral agents exist as ends-in-themselves; only those who are capable of applying abstract, impartial moral principles to their decision making share the equal right to be treated with respect. By contrast, the rights view recognises the equal inherent value of all subjects-of-a-life, including those who lack the capacities necessary for moral agency. These moral patients, (as I call them) have the same equal right to treatment as do moral agents.[70]

Yet, despite this extension (and contradiction) of Kant to include nonhuman (irrational) animals as 'moral patients' (even the word implies some degree of passivity at the hands

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[66] Ibid. p.9.
[67] Ibid. p.9.
[68] Tom Regan, *The Case for Animal Rights*, 3rd ed. (Berkeley and Los Angeles: University of California Press, 2004).
[69] Ibid. p.xvii.
[70] Ibid.

of an active human being), Regan affords this moral treatment to mammals only, '…the line I draw is "mentally normal mammals of a year or more".[71] Furthermore, he considers those of moral worth as only those animals who are deemed to have a consciousness (like Ryder's idea of subjectivity) or have the kind of complex awareness as those found in adult mammals.[72] This then is similar to Singer and Ryder's elevation of rationality and individualism over affect and emotionality. As Josephine Donovan argues:

> Thus, while it recognizes sensibility or feeling as the basis for treatment as a moral entity, the utilitarian position remains locked in a rationalist, calculative mode of moral reasoning that distances the moral entities from the decision-making subject, reifying them in terms of quantified suffering. Just as the natural rights theory proposed by Regan inherently privileges rationality, Singer's utilitarianism relapses into a mode of manipulative mastery that is not unlike that used by scientific and medical experimenters to legitimate such animal abuses as vivisection.[73]

This then, makes the early Right's views on nonhuman animals inherently masculine despite the use of analogies to compare speciesism with the denigratory treatment that women and people of colour experience at the hands of sexism and racism. Again, Donovan writes:

> Unfortunately, contemporary animal rights theorists, in their reliance on theory that derives from the mechanistic premises of Enlightenment epistemology (natural rights in the case of Regan and utilitarian calculation in the case of Singer) and in their suppression/denial of emotional knowledge, continue to employ Cartesian, or objectivist, modes even while they condemn the scientific practices enabled by them.[74]

Whilst still recognising the importance of Singer's, Ryder's and Regan's ideas to the development of understanding human-animal relations from both the personal and political viewpoint, one must also treat their theories with caution, and criticality. Particularly in discussing the complex and socio-culturally situated relations we have with nonhuman others.

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[71] Ibid. p.xvi.
[72] Ibid. p.273.
[73] Josephine Donovan, "Animal Rights and Feminist Theory," *Signs* 15, no. 2 (1990). P.358.
[74] Ibid. p.365.

The Humanities Embrace Animals: Jacques Derrida's Nakedness Amongst Female Felines

Most animal studies scholars argue that it was Jacques Derrida, in his paper *The Animal That Therefore I am (More To Follow),* who influenced the turn to the study of the animal in the humanities and social sciences.[75] However, following the argument made by Susan Fraiman in her article Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies I too contend that by situating Derrida as the 'founding father' of animal studies, it marginalises the wealth of ecofeminist work on animals which came before him, and which will be discussed shortly.[76]

Derrida took an autobiographical and reflexive approach when questioning what or whom is an animal. To do this, he reflected on his nakedness in front of his pet cat during an interaction in his bathroom one morning, and wondered what his cat sees and thinks when she sees him naked.[77] Gazed upon by his cat, Derrida observes his own embarrassment at the thought of being naked in front of her. He questions her existence by asking:

> Ashamed of what and naked before whom? Why let oneself be overcome with shame? And why this shame that blushes for being ashamed? Especially, I should make clear, if the cat observes me *frontally* naked, face to face, and if I am naked faced with the cat's eyes looking at me from head to toe, as it were just *to see* without touching yet, and without biting, although that threat remains on its lips or on the tip of the tongue.[78]

The cat, for Derrida, is a living, breathing, being, who *responds* to the world around her. He reassures the reader that, it is not so much about the cat being able to speak, but to *respond* to him which signifies her agency 'the said question of the said animal in its entirety comes down to knowing not whether an animal speaks but whether one can know what respond means'.[79] This interaction between the cat and human is Derrida's autobiographical refrain throughout the whole essay. He questions historical and contemporary understandings of the animal, and tears apart the notion of the Cartesian

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[75] Fraiman, "Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies." p.93.Jacques Derrida, "The Animal That Therefore I Am (More to Follow)," *Critical Inquiry* 28, no. 2 (2002). Derrida, *The Animal That Therefore I Am*.
[76] Fraiman, "Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies." p.93, p99.
[77] Derrida, *The Animal That Therefore I Am*. PP3-6.
[78] Ibid. p.4.
[79] Ibid. p.8.

idea of the animal as machine.[80] However, this autobiographical epiphany of animals being sentient and worthy of much more than their treatment in past and present times, is just that – autobiographical. Derrida's undoubted contribution to animal studies is written from an anthropocentric perspective. *He* describes *his* experiences with *his* cat, and that is all.

Nonetheless, this autobiographical and anthropocentric epiphany about nonhuman animals still reinforces a gendered hierarchy of being. It is, according to Fraiman:

> …[A] gendering that means to bare and implicate the speaker's masculinity along with his humanity but that also has the further effects of staging a seemingly primal confrontation between masculinized human and feminized animal…True that Derrida's cat is accorded the power of the gaze: the singular, discerning, "point of view" traditionally tied to cognition and reserved for humans. Yet the bathroom transaction overall – explicitly visual (and visually explicit) but definitely not tactile – leaves intact the old rationalist hierarchy valuing vision/mind/cognition over touch/body/emotion…Derrida's cat is granted provisional subject status in implicitly humanist terms.[81]

Derrida's interaction with his cat, although hugely influential to contemporary animal studies and the broader historiography, is not without its faults, as Fraiman rightly asserts. The very nature of the bathroom scene is a sexualized one,[82] with Derrida acknowledging the femaleness of cats throughout art and literature, his cat is also female, by which Derrida feels embarrassed by the she-cat's gaze.[83] Derrida's trepidation about gender and animals in the essay does not disappear but rather becomes slightly more fervent. He decries the work of Descartes, and others such as Lacan, Kant, Heidegger and Levinas as 'clearly all those (males and not females, for that difference is not insignificant here)' who have never felt the gaze of an animal 'other' and 'especially not naked, by an animal that addressed them'.[84] Later, he castigates their work as promoting violence against animals. His treatise comes to an end with an implicit yet contradictory call for the abandonment of sexual difference and an acknowledgement of the philosopher as "she" as much as a "he".[85]

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[80] Ibid. p.8-9. PP.69-87
[81] Fraiman, "Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies." pp.95-96.
[82] Ibid. p.94.
[83] Derrida, *The Animal That Therefore I Am*. P.6.
[84] Ibid. pp.13-14.
[85] Ibid.pp. 48-49.

But despite this contradictory acknowledgment and assertion of de-binarised gendered beings[86] in *The Animal That Therefore I am (More To Follow),* the work is, I concur here with Fraiman, about Derrida being a masculine rational human subject against a feminized animal.[87] And it is at this point, that despite Derrida's (misplaced) recognition of being the founder of animal studies, that we can turn to the work of ecofeminsts. They have laid the foundation for the area of human-animal studies, and their research was completed decades prior to Derrida's reflection on the nonhuman animal.

Ecofeminism/Feminist Animal Studies: Laying the Foundations Through Vegetarian Scholarship

Derrida's important contribution to Animal Studies, and to this thesis, cannot be understated. He is critical of a host of historical figures, most importantly for this research, of Descartes. He also places the nonhuman animal in the plural, recognizing individuality of being and agency, as much as sentience. However, one might ask, what is new about this? Derrida is oft quoted as being the "founding father" of Animal Studies[88] at the expense of the emotionally and politically engaged feminist work emerging from the late 1970s. It is here that I wish to review the broader literature in relation to this thesis from the area of feminist animal studies, or ecofeminism.[89]

There is a small and influential cohort of ecofeminists who have theoretically and methodologically influenced this thesis. They include Andrée Collard and Joyce Contrucci, Carol J. Adams, Josephine Donovan, Susan Griffin, Greta Gaard, Lori Gruen and Lynda Birke.[90] All of the work done by these scholars and activists challenges deeply

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86 Fraiman, "Pussy Panic Versus Liking Animals: Tracking Gender in Animal Studies." p.94.
87 Ibid. p.95.
88 Ibid. p.93.
89 Ecofeminism and feminist animal studies in this work is used interchangeably although in theory it is much more complex than that.
90 Andrée Collard and Joyce Contrucci, *Rape of the Wild: Man's Violence against Animals and the Earth* (Indiana: Indiana University Press, 1989), Greta Gaard, ed., *Ecofeminism: Women, Animals, Nature* (Philadelphia: Temple University Press, 1993), Carol J Adams and Josephine Donovan, *Animals and Women: Feminist Theoretical Explorations* (Durham, USA: Duke University Press, 1995), Carol J Adams, *Neither Man nor Beast: Feminism and the Defense of Animals* (New York: The Continuum Publishing Company, 1995), Adams, *The Sexual Politics of Meat*, Carol Adams, *The Pornography of Meat* (London: The Continuum International Publishing Group Ltd, 2004), Josephine Donovan and Carol J Adams, eds., *The Feminist Care Tradition in Animal Ethics: A Reader* (New York, USA: Columbia University Press, 2007), Carol Adams and Lori Gruen, eds., *Ecofeminism: Feminist*

embedded assumptions about the connection between animals and women, whether that be, for example, of the intersection between women and animals as literal and metaphorical pieces of meat[91] or as substitutes for each other in scientific experiments.[92] The methodological concept drawn upon by these scholars is intersectionality, which recognises the overlapping and mutually reinforcing categories of social analysis (gender, race, class and species) as forms of oppression or privilege. This concept is discussed more fully in chapter two, as it forms the theoretical backdrop to this thesis. Nevertheless, ecofeminists, taking inspiration from black feminists have used the concept of intersectionality to demonstrate the similar forms of oppression which subjugate both animals and women.

All of this work predates Derrida substantially, emerging in the late 1970s and early 1980s. Ecofeminist approaches to the question of animal started from a political and activist standpoint mainly focusing on the consumption of animals and westernized representations and practices of meat eating. Since the 1990s, this branch of feminism developed into a fully-fledged, yet marginal, academic discipline.[93] And, it was in this decade that the core debates and literature emerged concerning the interconnections between the oppression of animals and women, and also the role that feminism should play in highlighting this intersectional subjugation. For instance, ecofeminist Greta Gaard published her edited collection *Ecofeminism: Women, Animals, Nature* in 1993 which demonstrated the growing concern ecofeminism had for animals.

Alongside this growing recognition of the links between the exploitation of women and animals, in 1995, a debate in the journal *Signs* questioned the rise of feminists' concern for animals and their vegetarianism. The debate was prompted by an article written by feminist scientist Kathyrn Paxton George entitled Should Feminists be Vegetarian?[94] George lambasted the concerns of ecofeminists regarding meat-eating, claiming that vegetarianism can be seen as having 'deep male biases' whilst being touted as:

Intersections with Other Animals and the Earth (London: Bloomsbury, 2015), Birke, *Feminism, Animals and Science: The Naming of the Shrew*.

[91] Adams, *The Sexual Politics of Meat*, Adams, *The Pornography of Meat*.

[92] Birke, *Feminism, Animals and Science: The Naming of the Shrew*.

[93] Carol Adams and Lori Gruen, "Introduction," in *Ecofeminism: Feminist Intersections with Other Animals and the Earth*, ed. Carol Adams and Lori Gruen (London: Bloomsbury Academic, 2014). p.9-10 pp.21-25.

[94] Kathryn PaxtonGeorge, "Should Feminists Be Vegetarian?," *Signs* 19, no. 2 (1995).

> An ideal lifestyle choice, ethical vegetarianism actually discriminates against women, infants, children, adolescents, some of the elderly, other races and ethnicities, and those living in other cultures…of particular concern to me is the apparent link between feminist ethics and moral concern for animals[95]

Moreover, George went on to argue that by taking an ethical vegetarian stance, it consigns women and other marginalised groups of people to 'a moral underclass of beings who cannot be completely moral; so the logic of domination is imbedded in…ethical vegetarianism'.[96] In a sense turning the ecofeminist anti-dualist argument on its head, George claimed that the emerging ecofeminist concern for animals was actually a dualistic system in and of itself.[97] Trained as a scientist, George argued that women's bodies could not physiologically withstand a vegetarian diet (veganism had not entered into popular discourse in the mid-1990s!).

In a subsequent issue, Carol J. Adams, Josephine Donovan and Lori Gruen replied to George's claims, and argued that George reduced 'vegetarianism to some quantifiable nutritional resource that could be measured scientifically' [98], therefore leaving unquestioned the epistemological status of science. Moreover, Donovan's reply to George criticized the empirical evidence that George relied on to belittle the claims of ecofeminists and substantiated her claims with non-ethnocentric evidence that suggested the opposite.[99]

This debate seemingly created the space for the emergence of the research we see today in certain branches of animal studies, such as Critical Animal Studies (CAS). CAS follows feminism in its theoretical and methodological aims, and it takes an avowedly political stance towards the study of nonhuman animals.[100] It draws heavily on the work of the previously mentioned ecofeminists, whom despite being at the margins of scholarly

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[95] Ibid. p.406.
[96] Ibid. p.407.
[97] Ibid. p.408.
[98] Carol Adams, "Comment on George's "Should Feminists Be Vegetarians?"," *Signs* 21, no. 1 (1995). p.221.
[99] Josephine Donovan, "Comment on George's "Should Feminists Be Vegetarian?"," *Signs* 21, no. 1 (1995). p.226.
[100] Nik Taylor and Richard Twine, "Introduction: The 'Critcal' in Critical Animal Studies," in *The Rise of Critical Animal Studies: From the Margins to the Centre*, ed. Nik Taylor and Richard Twine (Oxon: Routledge, 2014).

activity in the 1990s, are now moving more into the centre ground. The most prominent of these being Carol J. Adams, especially her book *The Sexual Politics of Meat.*[101]

The Sexual Politics of Meat

This thesis would not have been written if it was not for the influential work of Carol J. Adams, particularly her book, *The Sexual Politics of Meat*. This book outlines the myriad ways that patriarchal values are tied to meat eating and the treatment of animals. The book is mainly centred around one particular concept – 'the absent referent'. The absent referent acts to cloak the violence inherent in the eating of meat, as 'animals in name and body are made absent *as animals* for meat to exist'.[102] Adams argues that through this renaming of the dead animal, we are able to forget about the living being that once was. Moreover, Adams finds that this idea of the absent referent in meat eating is also intersectional and applicable to the treatment of women, through its metaphorical usage,[103] by positing that:

> …[A] structure of overlapping but absent referents links violence against women and animals. Through the structure of the absent referent, patriarchal values become institutionalized. Just as dead bodies are absent from our language about meat, in descriptions of cultural violence women are also the absent referent. Rape in particular, carries such potent imagery that the term is transferred from the literal experience of women and applied metaphorically to other instances of violent devastation…The experience of women thus becomes a vehicle for describing other oppressions. Women, upon whose bodies actual rape is most often committed, become the absent referent when the language of sexual violence is used metaphorically. These terms recall women's experiences but not women.[104]

The book shows the processes of similar objectification of women and animals in western culture. According to Adams, the continuation of the butchering of nonhuman animals in western culture, and consumption of them, is linked to both the representation of women and their treatment, which normalizes forms of sexualized consumption and ultimately violence.

By highlighting the dual issue of animals and women's oppression, Adams' work could be considered to be the key foundational text in animal studies. Particularly, those studies

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101 Adams, *The Sexual Politics of Meat.*
102 Ibid. p.40.
103 Ibid.p42.
104 Ibid. pp. 42.43.

concerned with forms of intersectional oppression between the nonhuman and those considered to be human 'Others' in Western society. Adams continues this theme in her latest book *The Pornography of Meat,*[105] in which she further develops the idea of the links between sexual violence towards women, the absent referent, meat eating and representations of women.

Yet, Adam's ideas do seem to implicitly reject the relationships between humans and animals in indigenous societies. Although she posits the sexual politics of meat eating as one situated in the Western and commercial agri-industrial complex, her ideas could seem to inadvertently embrace ethnocentrism. For instance, she discusses the historical association between racism and meat eating but at the same time generalizes and romanticizes non-Western cultures' diets as predominately plant based (particularly for women).[106] Adams takes these implicit universalistic assumptions about male dominance and meat eating, and asserts:

> Worldwide this patriarchal custom is found. In Asia, some cultures forbid women from consuming fish, seafood, chicken and duck, and eggs. In equatorial Africa, the prohibition of chicken to women is common. For example, the Mbum Kpau women do not eat chicken, goat, partridge, or other game birds. The Kufa of Ethiopia punished women who ate chicken by making them slaves, while the Walamo put to death anyone who violated the restriction of eating fowl.[107]

While acknowledging the dominance of Western patriarchal values in relation to the treatment of animals and their use for consumption, Adams still inadvertently becomes ethnocentric in her writing. We do not find out *why* women in some cultures in Asia are not allowed to eat certain animal foods, nor do we get to understand the relationships and constructions of nonhuman animals and humans in indigenous cultures such as the Mbum Kpau or the Kufa of Ethiopia. Adams seems to eschew a cultural analysis of these very specific and different human-animal relations. For instance, some indigenous farming communities were very much based upon the principles of egalitarianism between women and men, animal and human, as sociologist Colin Samson writes:

> [A]mong indigenous farming peoples, both men and women had important roles but, despite the fact that women often had the most important ones, the US government efforts to make Native Americans into market farmers required that men and boys be farmers with women staying in the nuclear familial home…The

[105] Adams, *The Pornography of Meat*.
[106] Adams, *The Sexual Politics of Meat*. pp.3-10.
[107] Ibid. p.5.

> egalitarianism of many indigenous peoples, especially hunters, also encompasses relations between humans and the natural world. After a successful hunt it is important not to boast about animals that have been killed, or display any of the triumphalism associated with achievements in Western society. Indigenous hunting language conveys nothing equivalent to 'quarry', 'trophy' or even 'game', all of which imply a hierarchical relationship between people and animals…To brag of a good hunt is to place oneself above the animals, and therefore not show humility to forces upon which hunters depend.[108]

Adams for all her influential analysis of human-animal relations in the West, has a tendency to generalize indigenous peoples and claim that such communities are also founded on inequalities between male and females, animals and humans. Further, naturalizing a plant-based diet as on that is essentially feminine. Yet, there is no doubt to the influence she has had on this thesis, in terms of addressing the parallels between the animals used for experiments in mid-twentieth century Britain and broader cultural imaginaries of women at the time. But, one must be cautious about generalising across cultures and histories without investigating the many different ways of life that the West has and is trying to suppress.

Intersectional Animal Studies

This emerging field of animal studies grows out of the groundbreaking research of Adams and other Ecofeminists such as Gruen and Donovan mentioned above. They too have grappled with the intersectional in terms of gender, women and animality. However, as stated previously, this literature is often seen as superficial, and/or quite often ignored.[109] Many studies on the animal cite the work of Peter Singer and Jacques Derrida as the key literature, which means that ecofeminism's work within the animal studies arena risks becoming erased. Greta Gaard's Ecofeminism Revisited: Rejecting Essentialism and Re-Placing Species in a Material Environmentalism provides a manifesto against the erasure of ecofeminism.[110] She argues for an intersectional approach to scholarly activity, which is something this thesis attempts to do:

> The intersectional analysis of nature, gender, race, class, species and sexuality is not confined to an essentialist definition of feminism or ecofeminism, but rather

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[108] Colin Samson, *A World You Do Not Know: Settler Societies, Indigenous Peoples and the Attack on Cultural Diversity* (Washington: Brookings Institution Press). p.73.
[109] Adams and Gruen, "Introduction." p.30.
[110] Greta Gaard, "Ecofeminism Revisited: Rejecting Essentialism and Re-Placing Species in a Material Feminist Environmentalism," *Feminist Formations* 23, no. 2 (2011).

> offers a strategic conceptual approach toward bringing about the social justice, economic and ecological democracy needed to solve environmental crises in the present moment.[111]

Gaard suggests how ecofeminists such as Adams, have been both ignored and appropriated. Yet what is missing from this wealth of literature? Despite the strength of this scholarly work, and its influence on this thesis, my work is *historical*. Few histories, if any, have been written using the work of feminist animal studies scholars such as Carol J. Adams and Josephine Donovan. I hope to add to the emerging work in this area but take an historical purview rather than draw on contemporary empirical evidence to theorise the interrelationship between *gender* and animals. The distinction between the focus on women and gender is an important one. As demonstrated by the above literature, much ecofeminist work devotes attention entirely to the intersection between animals and women. I on the other hand, will be focusing more broadly on gender, its social construction and thus, its implications in terms of intersections of oppression (with that of animals and women) and privilege (with that of the sciences dominated by a socially constructed masculine epistemology and ontology).

Questioning Animal Experimentation: Sociological Accounts

The main scholars concerned with the use of animals in scientific experiments are Lynda Birke, Arnold Arluke, and Michael Lynch.[112] Lynch's main contribution to this growing body of writing is his paper Sacrifice and the transformation of the animal body into a scientific object: Laboratory culture and Ritual Practice in the Neurosciences, which appeared in the journal *Social Studies of Science* in 1988. Lynch draws on his own ethnographic observations in neuroscience laboratories in the late 1970s, to argue that the term 'sacrifice' is used in the laboratory to indicate a 'systematic consecration' of the

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111 Ibid.

112 Birke, *Feminism, Animals and Science: The Naming of the Shrew*, Lynda Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender," in *Gender and the Science of Difference: Cultural Politics of Contemporary Science and Medicine*, ed. Jill A. Fisher (United States of America: Rutgers, the State University, 2011), Arnold Arluke, "Sacrificial Symbolism in Animal Experimentation: Object or Pet?," *Antrozoös* 11, no. 2 (1988), Michael E. Lynch, "Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences.," *Social Studies of Science* 18 (1988).

animal body, which give an air of almost religious importance. The animal body is sacrificed by science as a means of providing for a greater good.[113]

Lynch goes on to discuss how the laboratory opens up a space for a new meaning of an animal to occur, by which he means that the animal body transforms from that of a 'naturalistic' to an 'analytic' animal. By naturalistic animal, he means:

> [T]he animal in ordinary perception and interaction; the animal of common sense, the animal as it is viewed and acted upon in the world of everyday life. The 'naturalistic' animal is the animal appreciated by laymen; a subject of scientifically unfounded attributions which have little possibility of rigorous verification. It is the animal championed by animal rights advocates and to which human-like 'feelings', perceptions, sensitivities, and even 'thoughts' are attributed.[114]

Accordingly, the naturalistic animal is a representation that permeates the cultural rather than scientific realms of society. The nonhuman animal's very being is anthropomorphized and relegated to a space of utter subjectification. On the hand, Lynch says that in the laboratory, the naturalistic animal transforms into an analytic one, which is:

> [O]stensibly an artifact – a product of human intervention. It is actively shaped by human agency, and in some cases literally carved up. Descartes' argument that the animal is no more than a machine becomes a self-fulfilling prophecy, since laboratory procedures assure the removal of characteristics that make up the naturalistic animal (its life, its holistic and reciprocal presence, and its 'subjective' attributes), in the scientific rendering of the phenomenon.[115]

Although Lynch does not argue for complete separation of these two categories of animal, he still presupposes a boundary between the two, and a distinction between science and culture.[116] And it is these boundaries that designate Lynch's concepts as embedded with a dualistic presupposition about the nonhuman animal in and outside the laboratory. As is discussed in chapter five of this thesis, the boundaries and/or categories given by Lynch do not recognise the emergence of an appreciation for the psychosomatic in laboratory animals, which began in the 1950s and paved the way for the regulation of laboratory animal welfare legislation.

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113 Lynch, "Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences.." p.265.
114 Ibid. p..267.
115 Ibid. pp. 269-270.
116 Ibid. pp. 268-269.

Other scholars who have taken on the issue of animal experimentation, following the writings and research of Michael Lynch are Lynda Birke, Arnold Arluke and Mike Michael. Lynda Birke can be seen as part of the feminist animal studies collective mentioned above. In her book *Feminism, Animals and Science: The Naming of the Shrew*, she focuses on how society, through the generation of scientific knowledge, constructs ideas about the animal.[117] She argues that scientific knowledge creates two ways of thinking about nonhuman animals, firstly by their similarities and differences to human beings. This tendency is most prevalent in using animals as replacements for the human in scientific experiments. The second is through the historically constructed separation of society and nature. This is done by situating nonhuman animals within a construct of nature which is seen as fixed and stable, and which the human is seen as separate from, existing instead in the social.[118] Moreover, throughout the course of this book, Birke draws on ecofeminist theory to question the views that feminists hold about the animal, and like Adams and Donovan, hopes to integrate the nonhuman into the parlance of feminist thinking.

For the purposes of this thesis, the key to Birke is her questioning of scientific practice, its methodologies and their justification of the use of animals in research. In the second section of the book, she does turn to the historical by outlining the nineteenth century debates on vivisection, and links these to the broader social context of the time in terms of Britain's imperial and industrial ambitions. She argues that vivisection practices in this period were only questioned because of the growing number of women entering into scientific, specifically physiological, research. Although this is commendable, the work lacks historical depth and breadth, and use of historical primary sources to justify her arguments. The history is briefly outlined and not sustained throughout the book, and therefore neglects completely mid-twentieth century science and its extensive use of animals.

Despite this, Lynda Birke's ideas are incredibly influential to this thesis, as she deals with animal experimentation science in all its guises, from the language of scientific reports that absent the animal (co-authored with Jane Smith and Dawn Sadler), to her work with Mike Michael on animal ethics and species boundaries in the laboratory as well as

[117] Birke, *Feminism, Animals and Science: The Naming of the Shrew*. p.6.
[118] Ibid. p.14.

writings with Consuelo Rivera-Fuentes on bodily pain and animal bodies, and research into the use of animals in medical research as a substitute for humans. [119]

Alongside Birke's paper with Mike Michael, the two have also written a book together with Arnold Arluke, entitled *The Sacrifice: How Scientific Experiments Transform Animals and People.*[120] According to the authors, the aim of the book is to 'examine the changing contexts of scientific use of animals, and how researchers deal with ethical and emotional dilemmas in various context'.[121] Their main concern is to address the interrelationships with animals and laboratory workers and how their interactions shape the identities of these humans who work in the laboratory.[122] They draw on an extensive range of primary sources such as ethnographic observations, field notes from pro-vivisection conferences, historical work and media reports.

Section one of the book addresses the contribution animals make to the process of scientific identity formation, and covers some historical ground here.[123] However, the historical approach is rather superficial and lacks the use of primary sources, instead, the authors draw on existing secondary scholarship to sketch out the historical development of animal experimental science. Section two discusses how students are trained to become scientists and the educational programmes and culture surrounding such an endeavour. They use empirical evidence collected form Arluke's previous ethnographic fieldwork in laboratories and American middle school science classes, as well as field notes from scientific conferences and interviews with laboratory workers.[124] Birke et al in this section claim that 'any student wanting to do science for its own sake, or as a prerequisite to doing medicine, must come to terms with practices such as dissection'.[125] Here the argument is about enculturation into science through scientific training. Section

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[119] JaneA. Smith, Lynda Birke, and Dawn Sadler, "Reporting Animal Use in Scientific Papers," *Laboratory Animals* 31 (1997), Lynda Birke and Mike Michael, "The Heart of the Matter: Animal Bodies, Ethics and Species Boundaries," *Society and Animals* 6, no. 3 (1998), Consuelo Rivera-Fuentes and Lynda Birke, "Talking with/in Pain: Reflections on Bodies under Torture," *Women's Studies International Forum* 24, no. 6 (2001), Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender.", Lynda Birke, "Animal Bodies in the Production of Scientfic Knowledge: Modelling Medicine," *Body & Society* 18, no. 3-4 (2012).
[120] Lynda Birke, Arnold Arluke, and Mike Michael, *The Sacrifice: How Scientifc Experiments Transform Animals and People* (West Lafayette IN: Purdue University Press, 2007).
[121] Ibid. p.5.
[122] Ibid.
[123] Ibid. p.18.
[124] Ibid. pp. 75-90, pp. 93-106.
[125] Ibid.p.83.

three of the book addresses the broader structural concerns regarding animal experimentation such as government regulation in both the United States and Britain. The section also addresses the attitude formations of the general public, and antivivisection groups.

The book concludes by saying that 'we doubt we have done full justice to the complexity of "animals", "scientists", or "publics", nor more importantly, to the interrelations between these'. This is a valid point, as this book undoubtedly furnishes the reader with an insight into identity formation in laboratory animal science, yet it appears to neglect the historical and gendered nature of science despite outlining a brief historical timeline at the beginning of the book. Nevertheless, the mid-twentieth century is left out of their benign historical overview, despite devoting an entire chapter to standardisation of laboratory animals – which as we shall see in the forthcoming chapters, began in the mid-twentieth century in order to address issues of "animal welfare" in the laboratory.

If not historical, Birke, Arnold's and Michael's work undoubtedly addresses some of the key issues raised in this thesis. Birke's feminist work on the gendered nature of science, and her discussions concerning the methodological technique and epistemological premise of the sciences that use animals as experimental test subjects, are the key influential aspects for this work.

Historical Work

Whilst feminist animal studies and sociological approaches to laboratory animal science provide the analytical tools to aid understanding of human-animal relations in the laboratory, they lack historical depth and detail. There are very few studies concerned with mid-twentieth century *British* science. Yet at the same time, animal history as whole is becoming more prominent, with a large collection of work emerging within this area in recent years.[126]

In terms of histories of laboratory human-animal relations, there are extremely few. As we will see in the forthcoming chapters, studies concerned with vivisection and animal

[126] Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?."p.S57.

experimentation is mainly devoted to the nineteenth century or before. As the animal historian Jonathan Burt argues:

> We have not to date been particularly well served by the history of animals in the twentieth century… [and] sometimes it seems as if there is a gap between the death of Queen Victoria and the arrival of Peter Singer…Key areas that redefine human-animal encounters in the twentieth century, are still underexplored.[127]

It is pertinent to assume, following Burt, that the historiography of this particular period is sparse. Other than the extremely influential work of Donna Haraway (who will be discussed shortly), mid-twentieth century *British* animal experimentation science has not been the subject of much scrutiny. The scholarship which is relevant to this thesis, and is discussed in chapter five of this thesis, is of Robert Kirk.[128] Kirk has addressed human-animal relations in the laboratory in mid-twentieth century Britain, but he does not address issues of gender, that from my analysis of the primary source material, seem quite obvious and important to the structuring of relations in the laboratory during this period. His work lacks critical depth in terms of taking an intersectional approach, but nevertheless is pertinent to, and has informed, my research.

On the American side, historian of science Karen Rader has written about the early to mid-twentieth century biological sciences in the United States, using mice as the major protagonists in the story. Her book *Making Mice: Standardising Animals For American Biomedical Research, 1900-1955* contributes to this small field of early to mid-twentieth century animal histories.[129] She focuses on major human actors in the field during this time, including the famous mouse geneticist and founder of the Jackson Memorial

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[127] Johnathan Burt, "Invisible Histories: Primate Bodies and the Rise of Posthumanism in the Twentieth Century," in *Animal Encounters*, ed. Manuela Rossini and Tom Tyler (Leiden: Brill, 2009).pp. 159-160.

[128] Robert G.W. Kirk, "'Wanted-Standard Guinea Pigs': Standardisation and the Experimental Animal Market in Brtain Ca. 1919-1947," *Studies in the History, Philosophy, Biology and Biomedical Science* 39, no. 3 (2008), Robert G.W. Kirk, "Between the Clinic and the Laboratory: Ethology and Pharmacology in the Work of Michael Robin Alexander Chance, C. 1946-1964," *Medical History* 53 (2009), Robert G.W. Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968," *Isis* 101, no. 1 (2010), Robert G.W. Kirk, ""Standardisation through Mechanisation" Germ Free Life and the Engineering of the Ideal Laboratory Animal," *Technological Culture* 53, no. 1 (2012), Robert G. W. Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986," in *Stress, Shock and Adaptation in the Twentieth Century*, ed. David Cantor and Edmund Ramsden (Rochester, NY: University of Rochester Press, 2014).

[129] Karen Rader, *Making Mice: Standardizing Animals for American Biomedical Research, 1900-1955* (Oxfordshire: Princeton University Press, 2004). P. 6.

Laboratory, C.C. Little and the role he played in promulgating mice as being the *sin qua non* of experimental "tools".

Rader documents the social, economic and political circumstances of the use of mice in biology laboratories across the United States saying:

> How researchers and their constituencies determine what scientific things – objects, methods, theories – can be taken for granted reveals something very important about the nature of their work, as well as about received cultural values. My hope is that by returning to a time when the existence and use of these creatures first took shape, especially to Little's prescient vision of mouse use, we may learn more about how human agency shapes the course of science. In this way, we can better appreciate scientific knowledge obtained from mice for what it is (as well as what it is not) and perhaps even begin envisioning new ways to make biomedical science a liveable and workable space for all animals – human and nonhuman – to inhabit.[130]

Evidently, Rader takes a methodological stance that is plural, with a focus on biographical, institutional and intellectual histories. She has visited laboratories as well as archives during the course of her research, as well as taking oral histories from those scientists who had contact with Little at the time. Yet, this prevents her ideas from having any form of political advocacy. She places to one side the *question* and *condition* of the nonhuman animal (mice) in her work, which most ecofeminists would address.

Her writing is incredibly detailed, with a wealth of primary evidence to substantiate her claims. The narrative is enticing and systematically organised around time periods in the twentieth century. But one cannot help but feel that this is a safe piece of work, which lacks criticality, as she herself writes, 'my interest in documenting how standardised laboratory animals came to be is both academic and political, but not condemnatory'.[131] Perhaps the most potent and politically critical aspect of her work is in the chapter on the use of mice and rodents as comparative organisms to the survivors of the nuclear bombing of Japan by the United States which brought an end to the Second World War.[132] Here she makes international links with scientific nuclear endeavours in Britain and the political and institutional conjunctions of the United States government with Little's mouse work in relation to radiation effects on male mice, the production of sperm and comparisons to male humans under such circumstances, namely Japanese

[130] Ibid. pp. 11-12.
[131] Ibid. p.23.
[132] Ibid. pp. 221-249.

bomb survivors. Here mice were taken as a substitute for these survivors as 'the "human experiment' [atomic radiation] could not, practically and ethically, be repeated, and researchers had good dosimetry estimates for the amount of radiation received by Japanese survivors'.[133]

At this point an intersectional analysis involving animals, race and gender may have been appropriate to emphasise post-war power relations. Nevertheless, Rader's work is historically important for animal studies and for the history of science, as it focuses on a particular species of animal, rather than take a generalised purview of animal experimentation.

As mid-twentieth century history and more specifically British animal history is rare, this section will instead discuss the broader historical studies. These, on the one hand, are influential to this work; on the other, I hope, with my work, to add to this body of existing knowledge by extending it to mid-twentieth century *Britain*.

Broader Animal Histories

There are a wealth of animal histories dedicated to addressing the nonhuman in history and more relevantly, animal experimentation in the nineteenth century. As previously stated, these are dealt with in the forthcoming chapters. The most prominent scholars with respect to this are Harriet Ritvo, Nicolas Rupke and Hilda Kean. On a more general level, and adding to the growing work of animal historians is Dorothee Brantz's edited collection of animal histories covering topics such as wild animals, urban and rural animal histories and animals in 'the service' of society. Other edited historical collections include Linda Kalof's *Looking at Animals in Human History* and Randy Malamud's *Cultural History of Animals in the Modern Age*.[134] The animal historian and literary scholar Erica Fudge is the most prominent scholar of British animal history, but her work focuses on

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[133] Ibid. p. 228.

[134] Harriet Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age* (London, UK: Penguin Books Ltd, 1990), Hilda Kean, *Animal Rights: Political and Social Change in Britain since 1800* (London, UK: Reaktion Books Ltd, 1998), Linda Kalof, *Looking at Animals in Human History* (London: Reaktion Books Ltd, 2007), Dorothee Brantz, ed., *Beastly Natures: Animals, Humans, and the Study of History* (Virginia: Univeristy of Virginia Press, 2010), Randy Malamud, *Volume 6: A Cultural History of Animals in the Modern Age (1920-2000)*, ed. Linda Kalof and Brigitte Resl, *A Cultural History of Animlas* (Oxford: Berg, 2011).

the Renaissance period and she has not undertaken historical work on the twentieth century, or the topic area of vivisection.[135]

For an historical overview of Britain's changing relations to nature in the early modern period, Keith Thomas' book *Man and The Natural World: Changing Attitudes in England 1500-1800* dedicates two chapters to human-animal relations, including the development of ideas of compassion rather than cruelty towards animals in this period.[136] Thomas argues that major changes in the relationship between humans and animals occurred in England between 1500-1800. Attitudes towards animals, he contends, changed from being anthropomorphic and religiously informed, to a more sentimentalised view, which took hold in the late eighteenth to nineteenth centuries. The reason for this change in attitude was twofold: the Enlightenment and urbanisation.[137] One the one hand Enlightenment values undermined the theological and anthropocentric view of human beings being the centre of God's creation. And on the other, with the emergence of natural history, biology, geology etc, brought in classificatory theories between species that emphasised our differences and also highlighted, via Darwin's theory on evolution, our similarities with other species:[138]

> What was important about the early modern naturalists was that they developed a novel way of looking at things, a new system of classification and one which was more detached, more objective, less man-centred than that of the past…By 1800 it was possible to regard plants and animals in a light which was very different from the anthropocentric version of earlier times.[139]

There is no doubt regarding Thomas' claims about the changing views of the world during the course of the Enlightenment period. The advent of many of the sciences such as natural history and biology, undoubtedly changed the way humans came to view and treat nonhuman animals. However, Thomas' work is a broad brush-stroke account detailing the entire period, where a focus on one particular aspect may have given his scholarship more depth, rather than breadth. Further, he lacks an analysis of the

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135 Erica Fudge, "Renaissance Animal Things," *New Formations* 76, no. 15 (2012), Erica Fudge, "Milking Other Men's Beasts," *History and Theory, Theme Issue* 52 (2013).
136 Keith Thomas, "Men and Animals," in *Man and the Natural World: Changing Attitdues in England 1500-1800* (1983), Keith Thomas, "Compassions Fo the Brute Creation," in *Man and the Natural World: Changing Attitudes in England 1500-1800* (London: Penguin, 1983).
137 Thomas, "Men and Animals."
138 Thomas, "Compassions Fo the Brute Creation."pp.166-167.
139 Keith Thomas, "Natural History and Vulgar Errors," in *Man and the Natural World: Changing Attitudes in England 1500-1800* (London: Penguin Books, 1983). p.52.

relationship between the shifting power relations and their intersectional effect on certain groups of humans as well as nonhuman others.

I would also challenge his claim that there was a historical abandonment of anthropomorphism. Despite changing attitudes to the natural world because of the emergence of the sciences and slow demise of the theological viewpoint, I would ask: is the turn to sentimentality in the late eighteenth and early nineteenth century just another, more complex and many layered version of anthropomorphism? Even though the Enlightenment ushered in a new era of thinking about human beings' relationships to human and nonhuman others, does that mean science can be left unquestioned, and seen as objective truth? As this thesis demonstrates, science is responsible for not only our current constructions of nonhuman animals but also how we behave towards them and treat them. Science is cultural. This is where we turn to the research of two historical sociologists who added to Thomas' scholarship by theorising these changing attitudes to animals in two very different ways. Firstly, Keith Tester and his book *Animals & Society: The Humanity of Animal Rights*, and secondly, Adrian Franklin's *Animals & Modern Cultures: A Sociology of Human-Animal Relations in Modernity*.

For Tester, acknowledging the centrality of cultural and historical variations of attitudes towards animals is just as important as theorising these changing relations. Drawing on Foucault, he identifies the social context of human-animal relations in modernity and analyses power and discourse. Tester suggests that Western attitudes to animals are bifurcated into two different types of pro-animal discourse during the nineteenth century, by which Tester neglects to analyse gender in association with this growing concern for animals. And secondly, a rights-orientated discourse emerging at the end of the nineteenth century, but remaining dormant until the 1970s with the publication of Peter Singer's book.[140] Moreover, he does not address any aspect of mid-twentieth century Britain, and claims that this this period was a time when concerns regarding nonhuman animals were marginal.

Adrian Franklin follows on from the work of Thomas and Tester. Despite the title of his book, one should not be deceived, as the work neglects a huge swathe of mid-twentieth

[140] Keith Tester, *Animals and Society: The Humanity of Animal Rights* (London, UK: Routledge, 1991).

century human-animal relations. It does not tackle the complex subject of animal experimentation at all. Rather, the book is divided into themes ranging from a broad discussion of human-animal relations in modernity to postmodernity, zoos, pets, sports, and agriculture, food and animal rights.[141] His work is highly theoretical, relying on Norbert Elias and his theoretical framework known as process sociology. This enables Franklin to theorise his historical study using the slippery concept of modernity. By drawing on Elias historical transformation of the concept of manners and taste over time, Franklin synthesises this idea to the emergence of a 'growing set of doubts and worries about the violent and cruel treatment of animals by humans and the gradual containment and control of violence among citizens of the modern state'.[142] Yet, despite this inventive use of Elias' analytical framework, the work is heavily theoretical, which leads to an overall simplified conclusion regarding the state of human-animal relations in 'modernity'. Franklin concludes by saying:

> [I]n the twentieth century there have been significant qualitative and quantitative changes in human-animal relations: people now seek more time with animals…and the nature of these relationships has changed fundamentally. Second[ly], we can identify two paradigm states of human-animal relations in the twentieth century which correspond, approximately, to the social conditions of modernity and late or postmodernity.[143]

Franklin goes on to assert that we have gone from a series of static relations with animals, with a relatively narrow range of species, for instance, animals were seen as objects in experiments, to postmodern relations, with nonhuman others. According to Franklin, in contemporary (postmodern) times, these relations are reversed and have dissolved the anthropomorphic treatment of animals, so characteristic of modernity.[144] For Franklin, the demarcation between modernity and postmodernity is ambiguous. He states that 'there is no sudden switch from one to another so no date can describe the point of transformation, although most agree radical change took place in the 1970s'.[145] Using the writings of Giddens and his idea of late modernity's turn to reflexivity and risk, he highlights how this had an impact on our changing human relations with animals.[146]

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141 Adrian Franklin, *Animals & Modern Cultures: A Sociology of Human-Animal Relations in Modernity* (London: Sage Publications Ltd, 1999).
142 Ibid.p.17.
143 Ibid. p. 188.
144 Ibid. p.189.
145 Ibid. p.35.
146 Ibid. p.57.

For me, this is problematic, as structural relations are highlighted more than discourse and power relations in the book. The more fluid and dynamic definition of modernity by Marshall Berman may have been more productive in his account of modern and postmodern relations. Berman highlighted the complex and inchoate nature of modernity, and with this Franklin may have been able to recognise that the descriptions of modernity and postmodernity help define *each other* rather than having any degree of historic linearity to them. This may have produced a more dynamic theorising of human-animal relations, more dependent on inductively generated empirical evidence rather than his very deductive and theory-laden approach, which criticises the philosophical standpoint of social constructionism.[147]

Science, Gender, Nature

In order to remedy these shortcomings, one must turn to the creative endevours of social and cultural historians. For all the absences and gaps in knowledge regarding animal histories, particularly histories of human-animal relations in the laboratory, there are plenty of histories concerning science, nature and gender. Feminist historians of science include Carolyn Merchant, Londa Schiebinger and Ludmilla Jordanova.[148] I also include in this section the research of Donna Haraway, as she is both an historian of science as well as a scientist, sociologist, psychologist, cultural studies scholar and many more! Moreover, she addresses the intersection of gender and animality from historical perspective.[149]

The work of Merchant, Schiebinger and Jordanova, all have one thing in common: they are concerned with the masculine nature of science and its construction of gender over a certain period of time. Moreover, addressing the link between the denigration of nature and exploitation of women. Merchant's book *The Death of Nature* can be seen as a

147 Ibid. p.4.
148 Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, Merchant, *Reinventing Eden: The Fate of Nature in Western Culture*, Schiebinger, *Nature's Body: Gender in the Making of Modern Science*, Schiebinger, *The Mind Has No Sex? Women in the Origins of Modern Science*, Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries*.
149 Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, Donna Haraway, *Modest_Witness@Second_Millenium.Femaleman_Meets_Oncomouse: Feminism and Technoscience* (New York, USA: Routledge, 1997), Donna Haraway, *When Species Meet* (Minneapolis, USA: University of Minnesota Press, 2008).

founding text of ecofeminist history. Merchant looked to the historical development of the sciences to formulate a radical critique of contemporary Western capitalist relations. Her intention in the book is to 'examine the values associated with the images of women and nature as they relate to the formation of our modern world and their implications for our lives today'.[150] Her focus remains firmly on the emergence of science as a hegemonic institution that shapes our perceptions of the natural world. She takes a broad synthesis of both 'the natural and cultural environment of Western society' at specific historical turning points such as the industrial revolution, mechanisation and conservation.[151]

This anti-dualistic approach to the history of science and nature showed that both nature and the social could not be deemed as naturally separate entities. But, were in fact constructed over time via the ideologies of the very sciences and scientists that Merchant discusses. This was highly original at the time the book was first published, and paved the way for a host of other histories that documented the demise of nature and the exploitation of women at the hands of science.

Yet, despite its commendable status, Merchant does have a tendency to universalise the impact of the scientific revolution on an infinite and static version of "nature". Moreover, by generalising pre-modern society as one that was harmonious with nature, Merchant overlooks culturally specific aspects of the scientific revolution and its impact, instead opting for a simplified argument about the impact of science on women and nature. A more focused piece of work that acknowledges the cultural situatedness of the impact of gender on the construction of scientific knowledge would be Londa Schiebinger's book *Nature's Body: Gender in the Making of Modern Science*.

Schiebinger aims to 'explore how gender [was] shaped by European science in the eighteenth century, and natural history in particular'.[152] It is a book which tracks the history of the emergence of the biological sciences and how men such Francis Bacon and René Descartes participated in its construction, which consequently created a politics of scientific knowledge, that gave life to some living beings at the expense of others, namely women:[153]

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[150] Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*. p.xvii.
[151] Ibid.
[152] Schiebinger, *Nature's Body: Gender in the Making of Modern Science*. p.2.
[153] Ibid. p.3.

> Crucial to [the] story is that, in the seventeenth and eighteenth centuries Europeans who described nature were almost exclusively male. Female naturalists were a rare breed, female taxonomists even rarer. Why were so few women?... Many have located the problem in women. Since the eighteenth century, conservatives focused on women's smaller or less specialised brains, their raging hormones, or faulty genes. Liberals have wanted to improve women's education and scientific self-esteem in an attempt to make them more "fit" for science.[154]

Drawing on a wealth of primary sources, including the works of leading eighteenth century naturalists such as Linnaeus and Buffon, Schiebinger creates a series of narratives that explore the relationship between gender and nature, arguing that 'gender was to become one potent principle organising eighteenth-century revolutions in views of nature'.[155] Race also is a significant factor in Schiebinger's analysis, and she presents her thesis by exploring a variety of sources from the time, demonstrating how race became a significant factor in scientists search for a distinction between people and "beasts".[156]

These taxonomies of gender and race are explored in depth and in detail, making the argument presented by Schiebinger incredibly cogent and powerful. What is missing from this work is the fact that she does not fully analyse the nonhuman animal in the shaping of gender by science. However, she does explore the emergence of the classification of 'mammals", and early primatology in chapter three, but the nonhuman is still rendered invisible in the work, as the focus remains firmly on the human. This is a prime example of feminist history writing, that explores the emergence of the construction of difference in humans via eighteenth century understandings of the world.

This is also true about her second book *The Mind Has No Sex? Women in the Origins of Modern Science.*[157] The book address the role women have played in the creation of scientific knowledge and synthesising it with the broader social and cultural context of the time: the seventeenth and eighteenth centuries.[158] The book is separated into three parts. The first examines the institutions of science and how these institutions acted as a conduit for the norms and values of society as a whole. The second part concentrates on 'women as historical actors manoeuvring within the gender boundaries prescribed by

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[154] Ibid. p.2.
[155] Ibid. p.4.
[156] Ibid. p.5.
[157] Schiebinger, *The Mind Has No Sex? Women in the Origins of Modern Science.*
[158] Ibid. p.6.

society'.[159] Thirdly, the book concludes with an examination of the biological sciences and how they have interpreted sex and gender, and how these scientific interpretations affected women's professional entry into science.

Her concluding chapter comments about the nature of femininity and more crucially addresses the role of power in shaping scientific knowledge, much to the detriment and exclusion of women. By addressing contemporary feminism, she manages to link the past to present day gender relations and notions of femininity and masculinity. Her concluding comments sum up the entire ethos of the book:

> We cannot give up a careful analysis of gender differences at least until they cease to plague us – inequalities between men and women (economic, political, ideological, and cultural) are still significant. I have emphasised the opposition between science and femininity because "femininity" represents a consistent set of values expelled from modern science. Science and femininity share an intimate history, shaped as they both have been by similar social, political, and economic forces. By burying gender in science, European culture lost part of its past. It is time to unearth that history; it is time to transform both science and society so that power and privilege no longer follow gender lines.[160]

This may be so, but who else is bounded in these webs of power-knowledge? What other gendered beings need to be considered? The nonhuman animal needs to, and can be compared with that of women in science and "femininity", as the opening quote of this introductory chapter demonstrates. Jordanova's book *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries*, is very similar to Schiebinger's work, yet methodologically quite different.[161]

Jordanova's work is also concerned with the biological and medical sciences, but between the eighteenth and twentieth centuries. Rather than focus on the professionalization of the fields, like Schiebinger, Jordanova focuses on the culture of science in relation to gender:

> The basic subject-matter of my work is twofold; first the extensive writings about and depictions of the differences between men and women, and of sexuality, in scientific and medical contexts; and second, the assumptions such writings contain about the gendered character of natural knowledge.[162]

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159 Ibid. p.7.
160 Ibid.p. 277.
161 Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries.*
162 Ludmilla Jordanova, Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries.*Ibid. p.2. You need to sort this reference out I think.

She explores the imagery of the specific sciences of the time, and discusses the broader social context that sustains the beliefs and ideas of such sciences. To augment this exploration into the culture of science, she uses a wide array of primary sources such as novels, poetry, magazines, advertisements and scientific and medical writings.[163] She seeks to analyse these primary sources using a Foucauldian methodology, studying discourses, rather than behavior. This enables a history to emerge that documents the power relations embodied in these discourses. Therefore, her work not only embraces historical storytelling but also is a cultural study, as much as a sociological endeavor. Jordanova is not ashamed to admit that her work, theoretically and methodologically, is interdisciplinary.[164] And, it is this aspect of her history 'of the body' so to speak, which makes it particularly relevant to this thesis.

Donna Haraway: Primates, Cyborgs and Dogs

Haraway is one the most prominent scholars with regards to research into animals, women and the history of science. It is important then, to consider her contributions to the feminist study of the history of science *and* animal studies. She is one of the very few scholars who discusses mid-twentieth century science and its use/study of nonhuman animals. Her research spans three decades and she is one of the most prominent academics to emerge from the feminist movements of the 1970s. She has written a large number of papers and books, but the work that I am discussing here has been narrowed down to four significant bodies of work (chapter three discusses her methodological influence), *Primate Visions: Gender Race and Nature in the World of Modern Science; Simians, Cyborgs and Women: The Reinvention of Nature*, her book (shortened title, see footnotes for full title) *Modest_Witness*, and finally, *When Species Meet.*[165]

In *Primate Visions*, Haraway pointed out the relationship between scientific humanism, the emerging field of primatology, gender and apes. Her grievance against humanism is

163 Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries*. p.6.
164 Ibid. p.18.
165 Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, Haraway, *Modest_Witness@Second_Millenium.Femaleman_Meets_Oncomouse: Feminism and Technoscience*, Haraway, *When Species Meet*.

familiar territory for Haraway and through most of her work she tends to advocate feminist socialism.[166] Yet, in *Primate Visions,* her main bone of contention is twentieth century primatology, addressing themes pertinent to this work, such as race, sexuality, gender, nation, family and class and how they have been 'written into' scientific understandings of nature in the western world. She writes:

> Monkeys and apes have a privileged relation to nature and culture for western people: simians occupy the border zones between those potent mythic poles. In the border zones, love and knowledge are richly ambiguous and productive of meanings in which many people have a stake. The commercial and scientific traffic in monkeys and apes is a traffic in meanings as well as animal lives. The sciences that tie monkeys, apes and people together in a Primate Order are built through disciplined practices deeply enmeshed in narrative, politics, myth, economics and technical possibilities.[167]

And, it is through Haraway's methodology and epistemological stance of science fiction, by using the SF signifier (narratives of speculative fiction, and scientific fact), that she treats scientific texts about the study of primates as narratives. These narratives reveal the intricate webs of power that people, monkeys and apes are enmeshed in:[168]

> In part, *Primate Visions* reads the primate text as science fiction, where possible worlds are constantly reinvented in the contest for very real, present worlds. The conclusion perversely reads an sf story about an alien species that intervenes in human reproductive politics as if it were a monograph from the primate field. Beginning with the myths, sciences, and historical social practices that places apes in Eden and apes in space, at the beginnings and ends of western culture, *Primate Visions* locates aliens in the text as a way to understand love and knowledge among the primates on a contemporary fragile earth.[169]

Each chapter combines a history of science with a feminist exploration into the nature of the primate sciences and their development in the twentieth century. From the pre-Second World War beginnings of the discipline to the advent of women primatologists in the 1960s and beyond, such as Jane Goodall and Diane Fossey, Haraway relates these scientific accounts of the ape to the broader political and cultural climate. By analysing the methodologies of the science of nature, she reveals to the reader a race, class and sex-fuelled epistemology, which has implications for both nature and culture, animal and human. Her narrative at the end remains open, unfinished and multi-layered, for there is no teleological end point in the sf game of primatology.

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[166] Zipporah Weisberg, "The Broken Promises of Monsters: Haraway, Animals and the Humanist Legacy," *Journal for Critical Animal Studies* 7, no. 2 (2009). p.24.
[167] Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. pp.1-2.
[168] Ibid. pp.3-5.
[169] Ibid. p.5.

Despite Haraway's keen focus on primates, her later work shifts to the cyborg, which she already hinted at in *Primate Visions*.[170] There, she discussed primates in space, and the American use of monkeys and chimpanzees during the space race of the 1950s and 1960s. Two particular chimps were her cyborg chimeras in that journey: Enos and HAM. Both named after the emerging military-technological complex of the post-war United States space era:[171]

> There could be no more iconic cyborg than a telemetrically implanted chimpanzee, understudy for "man", launched from the earth in the space program, while his conspecific in the jungle, "in a spontaneous gesture of trust", embraces the hand of a woman scientist named Jane in a Gulf Oil ad showing "man's place in the ecological structure"[172]

Haraway combined the cyborg space chimp with narratives of gender and science, that at the time were deeply entangled in Cold War politics and gendered advertising representations. Her next book thought was more of a celebration as well as a cautionary tale about the cyborg.

Simians, Cyborgs and Women: The Reinvention of Nature was first published in 1991, and seems more a manifesto for social change under Haraway's feminist-socialist vision. Methodologically drawing on her sf narrative, she continues the history of the domination of nature theme in the twentieth century and explains in more detail what she means by a cyborg:

> A cyborg is a hybrid creature, composed of organism and machine. But, cyborgs are compounded of special kinds of machines and special kinds of organisms appropriate to the late twentieth century. Cyborgs are post-Second World War hybrid entities made of, first, ourselves and other organic creature in our unchosen 'high-technological' guise as information systems, texts, and ergonomically controlled labouring, desiring, and reproducing systems. The second essential ingredient in cyborgs is machines in their guise, also, as communication systems, texts, and self-acting, ergonomically designed apparatuses.[173]

The book is comprised of a series of essays from 1978 to 1989, and in the first part of the book, she continues to draw on her work outlined in *Primate Visions* by discussing the

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[170] Ibid. p.139.
[171] Ibid.pp. 137-138.
[172] Ibid. p. 139. Here alluding to the young female primatologist, Jane Goodall, and her first expedition to Gombe National Park in Africa to study chimpanzees for her doctoral thesis.
[173] Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*. p.1.

ways in which scientific knowledge is produced about the behaviour and social lives of monkeys and apes. The second part of the book address the many different ways of 'reading' nature. From biological theory to classroom discussion on a women's studies course, fact and fiction are entwined to demonstrate the inseparability of nature(s) and culture(s). Part three address the cyborg and a critical consideration of feminist conceptions of gender. Throughout her entire catalogue of work, Haraway rightly asserts that 'this book treats constructions of nature as a crucial cultural process for people who need and hope to live in a world less riddled by the dominations of race, colonialism, class, gender, and sexuality'.[174]

These two books by Haraway were clearly critical of patriarchy, anthropocentrism and the dualistic humanism that historically forms the bedrock of scientific discourse. To follow on from Cyborgs and to continue her opposition to this dualistic knowledge, Haraway now offers us dogs, or what she terms "companion species". Both *The Companion Species Manifesto* and *When Species Meet* continue to challenge the patriarchal and anthropocentric epistemology she demonstrated about science in her previous two books.[175] Cyborgs and companion species, she tells us, are not complete opposites, but rather they

> bring together the human, non-human, the organic and technological, carbon and silicon, freedom and structure, history and myth, the rich and the poor, the state and the subject, diversity and depletion, modernity and postmodernity, and nature and culture in unexpected ways.[176]

In other words, Haraway is claiming that both cyborgs and companion species (namely dogs) represent complexity, ambiguity and contradiction, which in historical and contemporary dualistic frameworks are generally negated.[177] However, the main difference between cyborgs and canines is in the phenomenology of experience. Haraway emphasises the inter-relationality of experience between humans and nonhuman animals, dogs mainly in the *Manifesto*, and other animals in *When Species Meet.*

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[174] Ibid. p.2.
[175] Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003). Haraway, *When Species Meet*.
[176] Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. p.4.
[177] Weisberg, "The Broken Promises of Monsters: Haraway, Animals and the Humanist Legacy." p.27.

Haraway develops her version of inter-relationality through her appropriation of phenomenology and the work of Derrida.[178] She explains that 'companion species is a permanently undecidable category, a category-in-question that insists on the relation as the smallest unit of being and of analysis'.[179] The emphasis is firmly placed on the idea of enmeshment between humans and nonhuman others and she gives stark examples to illustrate this point, ranging from dog genetics to dog agility and training. Yet, despite this and her following of Derrida in her refusal to place all nonhuman animals into the category "animal", rather going for individual singularity, she still manages to instrumentalise certain human-animal relations.[180]

It is the chapter on suffering in *When Species Meet*, which reveals the ethical shortcomings of Haraway's potent philosophy of significant otherness.[181] The narrative from Haraway is interesting, particularly in relation to this thesis. She discusses the subject of animal experimentation and here maybe even surprisingly for the reader, contradicts her idea of mutual 'becoming with', she writes:

> The animal caretaker [in the laboratory] is engaged not in the heroics of self-experimentation (a common trope in tropical medicine histories) but in the practical and moral obligation to mitigate suffering among mortals – and not just human mortals – where possible and to share the conditions of work, including suffering, of the most vulnerable lab actors.[182]

In the process of claiming that the laboratory worker shares the suffering of the experimental animal, she is actually denying? such suffering of the animal, and at the same time reinforcing the dominant trope (to use her word) of human superiority over animal others. Haraway is quick to point out that this sharing is in actuality an instrumental relationship done in the name of solidarity.[183] She declares:

> [H]uman beings are not uniquely obligated to and gifted with the responsibility; animals as workers in labs, animals in all their worlds, are response-able in the same sense as people are; that is, responsibility is a relationship crafted in intra-action through which entities, subjects and objects, come into being…Instrumental intra-action itself is not the enemy; indeed, I will argue that work, use, and instrumentality are intrinsic to bodily webbed mortal earthly being and becoming.[184]

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178 Haraway, *When Species Meet*. Pp.19-27.
179 Ibid. p.165.
180 Ibid.pp.19-20.
181 Ibid. pp.69-93.
182 Ibid. p.70.
183 Ibid. p.70.
184 Ibid. p.71.

This instrumentality defined by mutuality is not necessarily unethical, as she rightly asserts when she writes about relations of use to each other.[185] Yet, this argument becomes increasingly problematic as the symmetrical and asymmetrical relationships in the laboratory are difficult to disentangle. Ultimately, she suggests that any instrumental relation is unequal when it comes to animals and despite advocating mutuality, she still 'resist[s] the tendency to condemn all relations of instrumentality between animals and people as necessarily involving objectification and oppression of a kind similar to the objectifications and oppressions of sexism, colonialism, and racism'.[186] For Haraway, therefore, laboratory animals are merely 'tools of the trade' whose suffering is, although not born symmetrically in the laboratory, still important for research. For Haraway this does not means that 'people cannot ever engage in experimental animal lab practices, including causing pain and killing'.[187]

Haraway then, reduces the animal, and human to instrumental relations. Yes, mutual and entangled ones, but the key is to recognise that ultimately instrumentalism is domination, hierarchy and control over others. Haraway's analysis of animal experimentation falls short on critique compared to her earlier work on the history of science. She refuses to acknowledge the intersectional in the laboratory, and only does so in terms of utility. Despite this, her writings are incredibly significant for my thesis in terms of the historical location of her earlier ideas, and her sharp analysis of the social, cultural and political dimensions of scientific practice. However, much more is needed in terms of her latest ruminations on laboratory animals.

Conclusion

Several broad areas of literature have been discussed in this chapter. This includes the work of animal rights scholar Peter Singer and philosopher Jacques Derrida. Other broad areas of research include the contemporary ideas of feminist animal studies scholars namely Carol J. Adams and her research about the intersectionality of women and animals.

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185 Ibid. p.74.
186 Ibid.p.74.
187 Ibid. p.75.

Even though literature concerned with human-animal relations in the laboratory is sparse, particularly in terms of histories concerned with this topic in mid-twentieth century Britain, and science more broadly, I have reviewed the current work related to this topic. This is mainly in the guise of sociological studies that embrace ethnographic methodologies. Animal histories that are relevant to this thesis include the work of Thomas, Franklin and Tester. However, the research here is either heavily theoretical or takes a broad-brush stroke approach. The forthcoming empirical chapters will deal with specifically relevant literature there, however, what I hoped to do with this chapter is give a comprehensive overview of the main influences on this work, whilst at the same time highlighting the gaps in the research.

The next chapter focuses on the methodology of the thesis and pays attention to the interrelationship between epistemology, methodology and technique.

Chapter Three

Methodology: Writing A History of Experimental Animals

If we recall the quote by the animal historian Erica Fudge from the introduction of this thesis, the idea of writing a history of animals is one that should seek to 'brush history against the grain', in other words, to write against the human.[188] Further, she argues that if we are to include animals in our writing of history, then we must question the construction of the categories human and animal. This is precisely what this thesis attempts to do, and it does so in a variety of ways: firstly drawing on the paradigms of social and cultural history (socio-cultural histories) with its Foucauldian inspired concepts; secondly, by looking at the work of feminist animal studies' scholars; and thirdly, by drawing on feminist science studies scholars to articulate the gendered nature of scientific knowledge production.

This chapter will outline and discuss the methodological implications of writing this piece of animal history. This is by no means an easy task, as the very discipline of history has always been firmly grounded in the human, and nonhuman animals have previously been perceived as being ahistorical entities, devoid of agency and therefore, not central to the study of history.[189] Further, animals do not speak, they do not leave documents, and so the task of the animal historian is made even more complex. Yet the animal historian Hilda Kean succinctly addresses this issue, saying, 'a different starting point might not be the subject matter, animals, per se but the historian's intentions'.[190] Rather, it is the choices that historians make when (re-)*presenting* the past lives of nonhuman animals, which makes their research animal-centred. It is not the case, as Kean goes on to state, to just 'write *in* animals *but* to re-work given frameworks' (my italics).[191]

It is my purpose in this chapter to outline the methodological approach used in this thesis by following Kean, and re-working normative historical frameworks. Not only

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188 Fudge, "A Left-Handed Blow: Writing the History of Animals." pp.13-14.
189 Erica Fudge, "What Was It Like to Be a Cow? History and Animal Studies," in *The Oxford Handbook of Animal Studies*, ed. Linda Kalof (Oxford: Oxford University Press, Forthcoming).p.3. Dorothee Brantz, "Introduction," in *Beastly Natures: Animals, Humans, and the Study of History*, ed. Dorothee Brantz (Charlottesville & London: University of Virginia Press, 2010). pp.2-6.
190 Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?." p.S65.
191 Ibid.p.S65.

that, I am arguing that the methodological imperatives of *any* research should not be mistaken for method. Rather, methodology is inextricably tied up with epistemology: *what* counts as knowledge, *who* produces that knowledge and *how* this informs one's ontological and epistemological perspective. This has an impact on the outcomes of research, whether you are quantitative or qualitative in approach. I am arguing therefore, that theory, concepts and method are bound together in mutually reinforcing 'knots', which presuppose how we, as researchers, write animal histories.

But, this is novel terrain, as it is not common for historians to outline their methodology. As Simon Gunn and Lucy Faire state, research methodologies are not an essential component of the writing of history and 'in large swathes of social, cultural and political history… dissertations, theses and books are written with barely a nod towards methodology'.[192] However, Dorothee Brantz, animal historian and editor of the book *Beastly Natures: Animals, Humans, and the Study of History*, exhorts historians to reveal their methodologies and notes:

> How we study them [animals] should reveal a variety of perspectives and methodological approaches. While that proposition sounds obvious, it is nevertheless worth noting because it has implications for both how we conceptualise animals and how we study history. With regard to animals, it means that we must always specify the sociocultural, economic, and political circumstances in which human-animal relations occur. We must also carefully chart the class, race, and gender relations that characterise human encounters with animals; and we must differentiate between diverse types of animals and their particular status within human societies.[193]

Certainly, this chapter aims to answer Brantz's proposition and outline one particular way of writing animal histories. Moreover, it is worth noting that there are several other scholars who have attempted to discuss the writing of nonhuman histories, most notably Erica Fudge in her methodological manifesto 'A Left-Handed Blow: Writing the History of Animals'. Here, she demarcates the writing of animal histories into three spheres, intellectual history, humane history and holistic history.[194] All of these encompass a way of writing about the history of animals in Western cultures. From the way animals have been used to convey meaning, whether that is religious or scientific (intellectual), to an

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[192] Simon Gunn and Lucy Faire, eds., *Research Methods for History* (Edingburgh: Edingburgh University Press Ltd, 2012).p.1.
[193] Brantz, "Introduction." Pp.10-11.
[194] Fudge, "A Left-Handed Blow: Writing the History of Animals."p.8.

analysis of the lived relation between humans and animals and their material significance, with the human remaining its focus (humane history). Fudge's main argument, though, is for historians of human-animal relations to embrace the holistic approach to history, by which she means a focus on difference and how the *categories* of human and animal are the cornerstones to historical analysis.[195]

Another animal historian, Jason Hribal, discusses the methodological complexities of writing animal histories in his paper 'Animals, Agency, and Class: Writing the History of Animals From Below'. His work encompasses the methodologies espoused by social historians and takes a Marxist (materialist) approach to animal histories that reifies the more-than-human, class relations and their attendant power operations; and renders meaningless the *question* and *condition* of the animal, which is an important part of this research.[196] Other animal historians include Harriet Ritvo, Linda Kalof and Randy Malamud. However, these historians do not discuss methodological techniques in relation to their intellectually outstanding and relevant work, rather they unquestionably draw on the approaches of normative historical study.[197]

This chapter will discuss the theoretical, methodological and conceptual techniques used in the writing of this thesis. The first section will outline the aims and research questions, the second section will discuss methodological pluralism by advocating an approach to the writing of nonhuman histories utilising the work of Donna Haraway and her notion of interpreting and analysing technoscience via a metaphorical game of "cats cradle".[198] The third section will discuss the three main theories drawn on in this thesis. Firstly, a discussion on the use of social and cultural history approaches, particularly the work of Michel Foucault. Secondly, the use of the epistemologies of feminist animal studies in the writing of animal histories, centring the discussions on discourse and material-semiotic practices, and thirdly, the invaluable use of feminist science studies in analysing gendered human-animal relations in the laboratory. Method and sources will then be explained,

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195 Ibid.pp.8-10.
196 Ibid.P.3-18. Jason Hribal, "Animals, Agency, and Class: Writing the History of Animals from Below," *Human Ecology Review* 14, no. 1 (2007). p.101-112.
197 Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*, Kean, *Animal Rights: Political and Social Change in Britain since 1800*, Kalof, *Looking at Animals in Human History*, Malamud, *Volume 6: A Cultural History of Animals in the Modern Age (1920-2000)*, Brantz, ed., *Beastly Natures: Animals, Humans, and the Study of History*.
198 Haraway, "A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies." pp.59-71.

and finally, this chapter will discuss Erica Fudge's notion of 'historical empathy' to argue for an ethics of animal history writing.[199]

Aims and Questions

The overall aim of this thesis is to demonstrate the interaction between scientific experimentation on animals and the construction of gender in mid-twentieth century Britain. What I am proposing is a twofold *analysis* of the *culture* of science and its use of animals in its experimental techniques from historical perspective: firstly, how scientific research forms *gendered* power-knowledge relations through the use of nonhuman animals, creating subject-object binaries. Secondly, the idea is to analyse the intersectionality of animal use in science with that of the normative assumptions of women in this era, and consequently, the *effects* of this knowledge production onto animals and women.

The questions being, not necessarily how animals are metaphorically positioned as women in scientific experimentation (although this is sometimes the case, see chapter four, and scholars Helen Longino, Carol J. Adams, Mary Mies and Vandana Shiva for example),[200] rather I elaborate on and investigate the ontological and epistemological character of science, and the socio-cultural effects of this knowledge on both the animal and the human. In light of this, the research questions are as follows:

- How is it that in both the theory and practice of science the nonhuman body is objectified, and how, as a result of this, does the animal body *as object* presuppose them as being useful for animal experiments?
- What kinds of knowledge does laboratory animal science produce, under what circumstances and methodologies? Do the knowledges produced link to the exercise of power both within and without the laboratory?
- Is the production of scientific knowledge through the use of animals gendered and what are the effects of such knowledge production?

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[199] Fudge, "What Was It Like to Be a Cow? History and Animal Studies."
[200] Helen E . Longino, *Science as Social Knowledge: Values and Objectivity in Scientifc Inquiry* (Princeton, New Jersey: Princeton University Press, 1990). p.120. Vandana Shiva and Mary Mies, *Ecofeminism* (London: Zed Books Ltd, 2014). p.50.

Crucially then, these three questions aim to demonstrate power-knowledge relations between humans and animals in the laboratory, the gendered dimensions of these relations and the *effects* on animals and women as a consequence of this. It is here where we can turn to the overall methodological design and technique of this research. The emphasis is firmly placed on embracing the plural, in order to achieve a more holistic approach to animal histories.

Methodological Pluralism: Playing Cat's Cradle with Donna Haraway

The methodological technique of this thesis is very much grounded in the qualitative research tradition through the use of historical documents. Qualitative research foregrounds the subjective experience of the researched and aims to generate in-depth, personal experiences and stories of the social world. This research strategy emphasises words rather than numbers and statistics, it is inductive in its approach and emphasises the experiential and reflexive.[201] With regards to the historical approach, documents become the central focus of concern, rather than individual research participants (see methods section below). Qualitative research does not usually use the deductive model, whereby there is an *a priori* dependence on theory and hypotheses testing.[202] Quantitative historical methods usually use numbers and statistics to depict certain historical events;[203] this approach has been abjured in this research due to the nature of the topic, its aims and questions. Instead, the technique is firmly grounded in the qualitative and advocates methodological pluralism, drawing on the ideas promulgated Haraway in her 1994 paper 'A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies'.

In this paper, Haraway argues for a plurality of approaches via the disciplines of science studies, feminism and cultural studies to analyse technoscience. By claiming that these three seemingly disparate approaches are interrelated and 'nicely bounded' together,[204]she hopes to create a methodological approach that is a 'toolkit' for a 'constitutively interactive, collaborative process of trying to make sense of the natural worlds we inhabit

[201] Alan Bryman, *Social Research Methods*, 5th ed. (Oxford: Oxford University Press, 2016).pp. 374-375.
[202] Jane Lewis, "Design Issues," in *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, ed. Jane Ritchie and Jane Lewis (London: Sage, 2009).pp.48-49.
[203] Elizabeth Ann Danto, *Historical Research* (Oxford: Oxford Universtiy Press Inc, 2008). p.27.
[204] Haraway, "A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies."p.66.

and that inhibits us'.[205] Therefore, her aim is to 'queer' the natural in the hope to make liveable worlds. In other words, she aims for destabilising the normal. Her metaphor of the cat's cradle helps to accentuate this notion of plurality, interrelationship and complexity:

> Cat's cradle is about patterns and knots; the game takes great skill and can result in some serious surprises. One person can build up a large repertoire of string figures on a single pair of hands; but the cat's cradle figures can be passed back and forth on hands of several players, who add new moves in the building of complex patterns.[206]

For Haraway, the game of cat's cradle is a metaphor for the use of more than one approach in research, to recognise the complexity of the worlds we inhabit and, as she says, those we 'inhibit'. To be able to do this, we must *understand* technoscience in order to change it and our relationship to the "natural", and to do this is to embrace plurality and 'knot' together approaches in order to address the destructive impulses of technoscience.[207]

I follow Haraway in her call to dispense with the singularity of approach by eschewing the view that research should be definite and have a limited set of processes. Historically, nothing is linear, straightforward and clear. Rather, this thesis aims to highlight the complex entanglements between animals, science, gender and the broader socio-cultural milieu. The stories told in this thesis will not be distinct or clear cut, but rather kaleidoscopic, diffuse and unspecific. I am not expecting single answers but hope to capture the textured world of animal experimentation in mid-twentieth century Britain. This 'messy' approach abjures the linear and teleological, and by drawing on a variety of approaches, I argue, can enable a more holistically grounded thesis to emerge. Following Haraway, each seemingly disparate approach can contribute to a more thorough analysis as 'each of them does indispensable work for the project of dealing with sites of transformation, heterogeneous complexity, and complex objects'.[208] This is particularly so in relation to rendering visible the nonhuman animal, so that one can attend:

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[205] Ibid. p.66.
[206] Ibid. pp.69-70.
[207] Ibid. p.60.
[208] Ibid.p.63. Here Haraway is referring to science studies, feminism and cultural studies. It is used in this context to refer to my three approaches used in this thesis.

> [T]o the differently situated human and nonhuman actors and actants that encounter each other in interactions that materialise worlds in some forms rather than others… These are the worlds in which the axes of the technical, organic, mythic, political, economic, and textual intersect in optically and gravitationally dense nodes that function like wormholes to cast us into the turbulent and barely charted territories of technoscience.[209]

This "messy" approach advocated by Haraway is used as a model in this research, and hopes to show forms of entanglements and co-constitutive relationships between disciplines in order to explain and analyse the sources. My intention is that these three approaches mark a collaborative process of trying to make sense of the interactions between animals, science and gender in mid-twentieth century Britain.

Making Visible the More-Than-Human: A Triangulated Approach To Animal Histories

As discussed above, in order to write a history that makes the presence of the nonhuman animal its focus, I have embraced Haraway's version of methodological pluralism. As she argues, 'what counts as human and as nonhuman is not given by definition, but only by relation, by engagement in situated, worldly encounters, where boundaries take shape and categories sediment'.[210] If then, we are to rewrite historical frameworks, as Kean would have it, in order to *do* animal history (see above),[211] then it means we have to draw on past approaches if we are to situate animal histories within a broader political context.

This very postmodern approach to historical methodology can be seen to provide a more comprehensive historical analysis of a given phenomenon.[212] Further, these approaches, (or paradigms) for studying historical phenomenon are inextricably tied to the theoretical structuring of ways of constructing narratives of the past.[213] Paradigms, theories and concepts are mutually reinforcing and provide us with a 'roadmap' to answer the research questions posed. The three approaches are used, not as a means of refining a theory or set of concepts about a past event, but rather deployed when and where appropriate, in

[209] Ibid.p.64.
[210] Ibid. p.64.
[211] Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?."
[212] Mary Fulbrook, *Historical Theory* (London: Routledge, 2002). p.48.
[213] Ibid. p.33.

order to illuminate a particular event or context in animal experimentation history. Firstly, we turn to social and cultural history as a way of situating this thesis. These provide a theoretical and conceptual framework for representing the nonhuman animal in history.

Social and Cultural History

The methodological premise of social history is to write a 'history from below'. David Hitchcock outlines what a 'history from below' is:

> '[H]istory from below' is history which preserves, and which foregrounds, the marginalised stories and experiences of people who, all else being equal, did not get chance to author their own story. History from below tries to redress that most final, and brutal, of life's inequalities: whether or not you are forgotten.[214]

Where Hitchcock outlined the necessity of doing a history from below for human animals, I am advocating a social and cultural history of the nonhuman and its many intersections of oppressions. These collective tales of animal experimentation aim to describe and explain these often-missed actors in history, and their usefulness in developing and contributing to the emergence of gendered norms and values in society. Previously, the scholarship emerging from social and cultural histories used gender, race and/or class as key conceptual forms of analysis;[215] this thesis extends the work of social and cultural histories as such, to include nonhuman animals as an important dimension to the study of history.

It seems appropriate then, at this point, to describe what I mean by a social and cultural history, and its relationship to this thesis. It has been argued by many historians that social and cultural histories have always been related to each other, whilst emphasising different elements of the historical world in different ways.[216]In fact, the two can be

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214 David Hitchcock, "Why History from Below Matters More Than Ever," in *The Future of History from Below: An Online Symposium [https://manyheadedmonster.wordpress.com/history-from-below/]*, ed. Mark Hailwood and Brodie Waddell (2013).

215 Selina Todd, "History from Below: Modern British Scholarship," in *The Future of History from Below: An Online Symposium [https://manyheadedmonster.wordpress.com/history-from-below/]* , ed. Mark Hailwood and Brodie Waddell (2013), Peter Burke, *What Is Cultural History*, 2nd ed. (Cambridge: Polity, 2008). pp.47-50 & pp.83-85.

216 Paula Fass, "Cultural History/Social History: Some Reflections on a Continuing Dialogue," *Journal of Social History* 37, no. 1 (2003). p.39.

combined to form 'socio-cultural histories'.[217] Accordingly, social histories describe the structural/material dimension of the past, that which informs class relations and focus on the description of the behavioural characteristics of different social groups.[218] One of the most famous social historians was E.P. Thompson; his book *The Making of the English Working Class*, documented the economic, political and cultural processes necessary for the formation of social class.[219] On the other hand, cultural history deals with what historian Paula Fass calls the 'liminal experiences' of people, and unlike social history, focuses on describing the uniqueness of individuals.[220]

Cultural historians' epistemology is very much within the postmodern/post-structuralist camp, with its emphasis on language, deconstruction and the fluidity rather than fixity of experience.[221] In other words, social history is the materialist approach to a 'history from below' and draws heavily on Marxian concepts to elucidate patterns of working class social life. Cultural history, on the other hand, deals with power, discourses and representations.[222] In this thesis I am avoiding the fixity of the social and the individual that is implied in the writing of a social history and drawing on cultural historical methodologies in order to write a history from below that negates social history's (original) humanist intentions.[223] In order to do this I have turned to the work of Michel Foucault and his ideas about the relationship between power and knowledge.

Michel Foucault, Animals and Power

This thesis will show that historical records exist which document different ways of knowing about the nonhuman animal. Acknowledging that animals are part and parcel of history, can challenge conventional ways of not only doing history but also disrupt normative ways of seeing the world.[224] This research does not aim for generalisation, nor presume that the past is inherently connected to the scientific use of animals in the

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217 Peter Burke, *What Is Cultural History?* (Cambridge, UK: Polity Press, 2004). p.115.
218 Fass, "Cultural History/Social History: Some Reflections on a Continuing Dialogue."p39.
219 Burke, *What Is Cultural History?* p.18.
220 Fass, "Cultural History/Social History: Some Reflections on a Continuing Dialogue."p.39.
221 Ibid.p.39-40. Burke, *What Is Cultural History?* PP76-101. Fudge, "A Left-Handed Blow: Writing the History of Animals." p.13.
222 Burke, *What Is Cultural History?* pp77-101.
223 Fudge, "A Left-Handed Blow: Writing the History of Animals."p.13.
224 Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?."p.S65.

present. It rather, problematizes the idea of 'truth' about animals, and recognises that there are different ways of knowing about animals, which are all historically, socially and culturally specific.

Michel Foucault's scholarship fits neatly within the socio-cultural history paradigm, for it eschews the fixity of the human and nonhuman relations, and acknowledges the instability of such a category, while addressing power-knowledge claims.[225] With this in mind, Foucault has informed this research in three ways. Firstly, with his ideas about control over bodies by various social institutions,[226] this is especially pertinent to the concepts used in this thesis to discuss human-animal relations in the laboratory. In *Discipline and Punish* Foucault outlines this idea of control over bodies. He claimed that social institutions such as the schools, prisons, factories and hospitals were all similar in their production of 'docile bodies'. This was through both the spatial organization of the institution and through means of surveillance.[227] Secondly, Foucault historically addressed systems of classifications, through his idea of 'regimes of truth'. In *The Order of Things* he dealt with categories and principles organizing knowledge creation in a given period, which he dubbed discourse.[228] Foucault suggests that these discourses should be the object of study.[229] Finally, this thesis draws on his concept of power-knowledge.

To examine power-knowledge relations is to question the nature of 'truth' and knowledge production in specific scientific practices that use animals. This thesis examines the power-knowledge that came to be understood as true in specific circles in Britain, at a particular point in time. What then, does Foucault mean by power and knowledge? It is worth quoting Foucault at length here:

> Power produces knowledge… power and knowledge directly imply one another;… there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not on the basis of a subject of knowledge who is or is not free in relation to the power system, but on the contrary, the subject who knows, the objects to be known and the modalities of knowledge must be regarded as so many effects of these fundamental implications of power-knowledge and their historical transformation. In short, it

[225] Fudge, "A Left-Handed Blow: Writing the History of Animals." p.14.
[226] Michel Foucault, *Discipline and Punish: The Birth of the Prison*, 4th ed. (London: Penguin Books Ltd, 1991). Burke, *What Is Cultural History?*pp.55-57.
[227] Foucault, *Discipline and Punish: The Birth of the Prison*. Need full reference.
[228] Michel Foucault, *The Order of Things*, 11 ed. (Oxon and New York: Routledge: 2008).
[229] Ibid.

> is not the activity of the subject of knowledge that produces a corpus of knowledge, useful or resistant to power, but power knowledge, the processes and struggles that traverse it and of which it is made up, that determines the forms and possible domains of knowledge.[230]

Power in this thesis, draws on the Foucauldian idea of its inseparability with knowledge and notions of what counts as 'truth'. This research aims to highlight the delicate interplay between power in a given society and the production of forms of knowledge through the use of nonhuman animals in scientific research. This is done by applying and extending the work of Michel Foucault's theory of power.

As Foucault does not refer to nonhuman animals in any of his work, the extension of Foucault's conceptual apparatus comes in the guise of Lisa Johnson and her book *Power, Knowledge, Animals.*[231] Johnson uses the Foucauldian method of archaeology to place formerly subjugated knowledges into a Foucauldian framework of analysis. Using key concepts such as power, knowledge, and discourse Johnson analyses the use and regulation of animals in the western world, drawing on historical and contemporary examples. Further, she draws comparisons between the treatment of animals in western societies to other subjugated groups in history, such as slaves and women.

This means that the research not only is a collection of tales about animal experimentation, which emphasises narrativity, but also identifies collections of discourses, which inform how we see the world. For Foucault, discourses are collections of words, which hold authority about what counts as 'true'. The idea is to question the power of these words, and the rules by which such words are judged to be true or false.[232] These discourses also relate to positions of power-knowledge, and which people have the authority to speak on behalf of others. As Johnson affirms, discourse and its processes of power 'allows us to delimit the structure of conceptual space that is – or has been – our understanding of animals'.[233] This process is highlighted throughout this thesis, where discussions about the nature of experimental animals are emphasised, and

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[230] Foucault, *Discipline and Punish: The Birth of the Prison*.pp.27-28.
[231] Lisa Johnson, *Power, Knowledge, Animals* (Basingstoke: Palgrave Macmillan, 2012).
[232] Ibid. p.12.
[233] Ibid. p.13.

the similarities between institutional ways of knowing about the use of animals in scientific experimentation are observed.

If, then, I am talking about how animals were broadly constructed in experimental research, and why they were, then one also must address the effects these discourses of power-knowledge had on nonhuman animals and if there are parallels that can be made between other subjugated groups at the time. In this research, I have addressed the gendered nature of scientific knowledge production and its implications for both animals and women. For this, Foucauldian inspired social and cultural historical epistemologies will not suffice, instead, feminist science and feminist animal studies have also informed the categories of social analysis in this thesis.

Feminism

> The vertical relationship between researcher and 'research objects', *the view from above*, must be replaced by the view *from below*. This is the necessary consequence of the demands of conscious partiality and reciprocity. Research, which so far has been largely an instrument of dominance and legitimation of power elites, must be brought to serve the interests of dominated, exploited and oppressed groups[234]

The basic premise of all feminist research is to give voice to marginalised and oppressed groups in society, with a specific focus on women. As the quote above by ecofeminists Mary Mies and Vandana Shiva testifies, the practice of research is inherently political and should take the 'view from below'. This is closely linked to the epistemological stance of social historical approaches detailed above. Therefore, it is no surprise that the work of feminists especially in relation to animals and gender have greatly my ideas. This section will discuss the role that feminist animal studies and feminist science studies have played.

Feminist Animal Studies

Feminist animal studies are often seen as a branch of ecofeminism. Ecofeminism addresses 'the various ways that sexism, heteronormativity, racism, colonialism, and ableism are informed by and support speciesism'.[235] The aim of feminist animal studies is

[234] Shiva and Mies, *Ecofeminism*. p.45.
[235] Adams and Gruen, "Introduction." p.1.

to analyse how and why these social categories intersect, in order to 'produce less violent, more just practices'.[236] This makes the discipline inherently political, intersectional and animal-centred. This thesis has drawn on many ecofeminists' work, most notably Carol J. Adams, Josephine Donovan, Richard Twine, Carolyn Merchant and Lynda Birke.[237] What binds these scholars together and separates them from "traditional" feminisms of the past is the use of the concept of intersectionality. This thesis uses the concept of intersectionality put forward by feminist animal studies scholars to account for and analyse the historical parallels between animals and women in mid-twentieth century Britain.

Intersectionality

Intersectionality's emergence as a category of analysis can be traced back to the feminisms of the 1980s and early 1990s, as the consequence of an attempt to theorise the different ways in which the lived experiences of gender and race interacted to help shape each other.[238] The term was first coined by Kimberle Crenshaw and appeared in the *Stanford Law Review* in 1991 in her article 'Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color', which argued that being a Black woman cannot be independently understood in terms of being black *or* a woman but rather the two must be considered together and seen as mutually reinforcing.[239] As feminist Ann Garry avers, intersectionality holds 'that oppressions by race, ethnicity, gender and class etc., do not act independently of one another in our lives, instead each is shaped and works through others'.[240] It also incorporates not only axes of oppression but also

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[236] Ibid.

[237] Carol J Adams, *The Sexual Poltics of Meat* (Oxford, UK.: Polity Press, 1990). Adams, *Neither Man nor Beast: Feminism and the Defense of Animals*. Adams and Donovan, *Animals and Women: Feminist Theoretical Explorations*. Donovan and Adams, eds., *The Feminist Care Tradition in Animal Ethics: A Reader*. Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*, Merchant, *Reinventing Eden: The Fate of Nature in Western Culture*. Richard Twine, *Animals as Biotechnology: Ethics, Sustainability and Critical Animal Studies* (London: Earthscan Ltd, 2010). Birke, *Feminism, Animals and Science: The Naming of the Shrew*. Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender."

[238] Twine, *Animals as Biotechnology: Ethics, Sustainability and Critical Animal Studies*.p.9.

[239] Kimberle Crenshaw, "Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women Ofcolor," *Stanford Law Review* 43, no. 6 (1991).pp1241-1299

[240] Ann Garry, "Intersections, Social Change and "Engaged" Theories: Implications of North American Feminism," *Pacific and American Studies* 8 (2008).p.100.

privilege.[241] It helps to develop strategies to deal with differences and connections between analytic categories and the lived experience of humans and animals.[242]

This original strand of intersectionality remains firmly within the human domain, but I follow the work of the feminist animal studies scholars mentioned above such as Adams, Donovan and Twine; and extend the intersectional approach to the more-than-human.[243] By taking this animal studies approach it is hoped that this thesis will contribute to the developing body of work which helps to highlight the many ways dualism operates to form categories of difference between the humans and animals, as Twine states:[244]

> The animal studies approach to intersectionality, which is essentially to target the workings of human-animal dualism as part of a broader dualistic formation, argues against simply seeing various forms of oppression as forms of *dehumanization*. This points to a short-sightedness in simply aspiring for 'human citizenship' and instead advocates pursuing a more systematic questioning of the historically, culturally, economically and politically situatedness of the 'human'.[245]

By studying not only the various forms of intersecting oppression between animals and women, it also highlights the intersectional privileges of the ruling groups and hence, this thesis' focus on animals *and gender*. As Critical Animal Studies scholar Jess Gröling argues that feminists ought to focus on the people and institutions 'they don't like', in other words studying 'up' as opposed to 'down'. This in turn has led to a paucity of research in the domain of the privileged,[246] which this thesis aims to highlight in terms of the laboratory practices in certain areas of science, as well as channel and give voice to those who can't speak, the nonhuman animal and their histories. Thus, the concept of intersectionality in my research enables a space to be opened up from which subjugated knowledges emerge on the one hand, and on the other emphasizes the practices of the powerful. Therefore, the emphasis is on deconstructing power relations between groups in society.

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[241] Ibid.p.101.
[242] Ibid.p.99.
[243] Twine, *Animals as Biotechnology: Ethics, Sustainability and Critical Animal Studies*. p.10.
[244] Ibid. p.10.
[245] Ibid. p.11.
[246] Jessica Gröling, "Studying Perpetrators of Socially-Sanctioned Violence against Animals through the I/Eye of the Cas Scholar," in *The Rise of Critical Animal Studies: From the Margins to the Centre*, ed. Nik Taylor and Richard Twine (Oxon: Routledge, 2014).p.90.

Clearly then, feminist animal studies scholars advocate the intersectional approach to human-animal studies. Although I am discussing feminist animal studies and science studies separately, it is worth noting, before we move onto to the next section, that the two are epistemologically and ontologically linked. Yet, at face value, feminist animal and feminist science studies seem to be two discrete disciplines, the work of two major feminists, Haraway and Birke seem to co-opt both areas in their work on nonhuman animals (Haraway will be discussed in more detail below).[247] Historiographically, feminist science studies have seemingly neglected to focus on the important role animals have made in the construction of gendered scientific knowledge. As Lynda Birke, Mette Bryld and Nina Lykke argue, and I quote at length:

> Three decades ago feminist work on science concentrated on women's health and on critiques of biological determinism. Among other things, this determinism typically relied on parallels drawn between stories of animals behaving in particular (instinctive) ways, and gender-stereotypic behaviour in humans. Repudiating these claims inevitably meant that feminists tended to avoid speaking about nonhuman animals, while emphasising the social construction of gender, and human uniqueness. Meanwhile, the biological sciences have been a key focus for feminist science studies – the very areas of science which not only help to define what animals are, but also use nonhuman species extensively in the creation of biological knowledge. In that sense, then, animals have been central to how we have analysed science, yet, covertly so.[248]

Birke *et al* argue that feminist science studies should take animals seriously. To do this they draw on Judith Butler's notion of performativity for analysing interactions between humans and animals.[249]Birke *et al* emphasise the discursive repertoires that delimit the human from the animal, and how it relates to socio-cultural power relations.[250] They use the term 'animaling', analogous to Butler's 'queering', to suggest the linguistic structures and discourses, which enable 'the word 'animal' in its specific sense of being

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247 Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science*, Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, Haraway, *Modest_Witness@Second_Millenium.Femaleman_Meets_Oncomouse: Feminism and Technoscience*, Haraway, *When Species Meet*, Birke, *Feminism, Animals and Science: The Naming of the Shrew*, Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender."

248 Lynda Birke, Mette Bryld, and Nina Lykke, "An Exploration of Intersections between Feminist Science Studies and Studies of Human/Animal Relationships," *Feminist Theory* 5, no. 2 (2004). p.168.

249 Ibid.p.168.

250 Ibid. p.169.

oppositional to human'.[251] The key to this epistemology lies in its emphasis upon discourse and power:

> Linguistic boundaries can be maintained by humans in relation to animals…like queering, 'animaling' is a discursive process, operating between these human/animal conjunctions…This could matter in the case of disputed politics, such as disagreements between antivivisectionists, opposed to use of any living animal in research, and those who seek legislative reform, for whom definitions of 'animals' may be contested.[252]

Therefore discourse and power are integral to problematizing the animal in the same way that gender has been by feminists in previous decades. Epistemologically speaking, the two feminisms interact and can be, if used appropriately, mutually reinforcing and productive. The two provide an intersectional *methodology* in order to help analyse intersectional social relations of the nonhuman and human.

Feminist Science Studies

Where feminist animal studies have been used to highlight intersections of oppression between animals and women in this thesis, feminist science studies helps to problematize gender as an historical category. Underpinning the intersectional approach is the willingness to acknowledge gender, race, class and species as social constructs but with very real material implications.[253] As noted by Bike *et al* above, there are epistemological links between feminist animal and science studies, and this thesis draws on these webs of connection when discussing scientific experiments on animals and the gendered dimensions of such.

Feminist science studies explores at the relationship between science, gender and women (race too has been added as a category of analysis), as Muriel Lederman and Ingrid Bartsch note, feminist science studies look at three aspects of the relationship between science and gender:

> [firstly in its] socially defined, gender role of women in society that impacts their access to a life in science, the socially defined role of women in science , and the gendered norms within the culture of science… Gender and science (in contrast to women in science) refers to the culture of science and social situatedness of

[251] Ibid. p.169.
[252] Ibid.p.170.
[253] Ibid.

> women, through which girls and women receive incompatible cultural messages. On the one hand, society has normalized women's roles as females, with the nurturing and cooperative behaviors that his entails. On the other hand, scientists are expected to be rational, unemotional and, driven by funding and recognition… The associations between gender, science and women are complex, but their examination is crucial[254]

The idea in this thesis is to acknowledge the work of feminist science studies scholars' arguments about the nature of science and its practices and use these to inform my analysis of animal experimentation. Feminist analyses of science address the broader socio-cultural milieu as well as analysing scientific institutions, the language of science, its methods and interpretations in order to render visible the masculine nature of it.[255] This thesis will draw on a variety of scholars from this area including Ruth Hubbard, Evelyn Fox-Keller, Ann Fausto-Sterling, Helen Longino, Carolyn Merchant, Lynda Birke and Donna Haraway.[256] However, it is the work of Haraway that is prominent here, providing this thesis with more than merely the methodological tools to analyse historical human-animal relations.

Haraway and the Material-Semiotic

Donna Haraway has a ubiquitous presence in this research. Her work has been used as both a methodological framework, as well as providing me with useful conceptual tools for analysis of historical materials. She is a historian of science, a scholar of animal studies, a researcher within the discipline of feminist science studies; she is an academic of cultural studies, anthropology, sociology and even psychology. Donna Haraway's work is everything and something specific at the same time. She refutes categorization and is most certainly an advocate of interdisciplinarity. In this thesis she has informed my work from the feminist animal and science studies perspective, especially in terms of my own epistemological and ontological stance in this research.

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254 Muriel Lederman and Ingrid Bartsch, "Introduction," in *The Gender and Science Reader*, ed. Muriel Lederman & Ingrid Bartsch (London: Routledge, 2001). p.2.
255 Ibid. p.2-3.
256 Ruth Hubbard, *The Poltics of Women's Biology* (New Jersey: Rutgers University Press, 1992). Fox-Keller, *Reflections on Gender and Science*, Fox-Keller, "Language and Ideology in Evolutionary Theory: Reading Cultural Norms into Natural Law.", Longino, *Science as Social Knowledge: Values and Objectivity in Scientifc Inquiry*. Anne Fausto-Sterling, *Myths of Gender: Biological Theories About Women and Men*, 2nd ed. (New York: BasicBooks, A Division of HarperCollins Publishers, Inc., 1992).

In her paper 'The Promises of Monsters: A Regenerative Politics for Inappropriate/d Others', she discusses the necessity of accounting for the materiality of discourse. Haraway calls this epistemological approach the material-semiotic, and she uses it:

> [T]o highlight the object of knowledge as an active part of the apparatus of bodily production, without ever implying immediate presence of such objects or, what is the same thing, their final or unique determination of what can count as objective knowledge of a biological body at a particular historical juncture. …"Objects" like bodies do not pre-exist as such. Similarly, "nature" cannot pre-exist as such, but neither is its existence ideological. Nature is a commonplace and a powerful discursive construction, effected in the interactions among material-semiotic actors, human and not. The siting/sighting of such entities is not about disengaged discovery, but about mutual and usually unequal structuring, about taking risks, about delegating competences.[257]

Here, Haraway questions the idea of objectivity and calls for recognition of the discursive construction of nature (objects of knowledge), coupled with an acknowledgement of the material realm. Like Judith Butler, Haraway denotes the material and intimately links it to the discursive. In other words, there is no pre-discursive 'body' existing independently from language, but rather the material and semiotic are bound together in powerful ways: it is materialization *through* discourse, without breaking away from acknowledging the social construction of "nature" and/or objects of knowledge.[258]As Haraway puts it in her book *Modest Witness*…:

> Objects like the fetus, chip/computer, gene, race, ecosystem, brain, database, and bomb are stem cells of the technoscientific body. Each of these curious objects is a recent construct or material-semiotic "object of knowledge", forged by heterogeneous practices in the furnaces of technoscience. To be a construct does NOT mean to be unreal or made up; quite the opposite. Out of these nodes or stem cells, sticky threads lead to every nook and cranny of the world. Which of these threads to follow is an analytical, imaginative, physical, and political choice.[259]

In this thesis, I am committed to showing how animals, science and gender as objects and bodies, are tied together in knots of 'knowledge-making practice… bodily histories, human and nonhuman actions… inherited narratives… [and]... cultural processes'.[260] But how do I construct such narratives and tell such stories about these material-semiotic entanglements? For this I turn to archival documents.

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[257] Donna Haraway, "The Promises of Monsters: A Regenerative Politics for Inappropriate/D Others," in *Cultural Studies* ed. Lawrence Grossberg & Cary Nelson (London: Routledge, 1992).

[258] Ibid.P. See also: Butler, *Bodies That Matter*. pp. xiv-xx.

[259] Haraway, *Modest_Witness@Second_Millenium.Femaleman_Meets_Oncomouse: Feminism and Technoscience*. p.129.

[260] Ibid.

Documenting Experience: Digging Deep for the Animal in the Archives

How exactly can the nonhuman animal be written into the study of history? As Dorothee Brantz says, 'writing the history of animals demands negotiating our desire to recover the historical lives of animals vis-à-vis the fact that all of the available records of those lives of animals have been produced by humans'.[261] If Brantz is right, and we are then talking about representation, can this work politically recognize the nonhuman animal only through representation? If I am embracing the material as well as the socially constructed in this history, the material-semiotic, how do I account for the material presence of the animal in the documents and consequently this research as a whole? Erica Fudge provides us with an answer to this quandary, and it has echoes of Haraway's notion of the material-semiotic:

> Animals are present in most Western cultures for practical use, and it is in use – in the material relation with the animal – that representation must be grounded. Concentration on pure representation (if such a thing were possible) would miss this, and it is the job – perhaps even the duty – of the historian of animals to understand and analyse the uses to which animals were put. If we ignore the very real impact of human dominion… we are ignoring the fundamental role animals have played in the past.[262]

Therefore, the responsibility lies firmly with the human who has written about the animal, this then renders the past lives of animals *historical* and facilitates the writing of an animal history.[263] The documents I have chosen and the re-framing of these into an historical narrative about nonhuman laboratory animals has meant that the material *and* representational (semiotic) lives of experimental animals have been made visible. As Kean notes:

> When social historians such as E. P. Thompson and [feminist historian] Sheila Rowbotham… chose to write politically engaged histories about working class women and men, they were not deterred from doing so by what was often regarded as a comparative lack of material written by the protagonists themselves. They were clear about their own role in writing new histories.[264]

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[261] Brantz, "Introduction." p.5.
[262] Fudge, "A Left-Handed Blow: Writing the History of Animals." p.7.
[263] Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?." p.S60
[264] Ibid.

It is here then that we can turn to the kinds of sources used to write this research, what archives were consulted and how I chose to interpret these documents. Furthermore, to respond to Kean's idea of accounting for the role of the historian in embracing the animal in historical research, I will end with a discussion on research ethics in the guise of Fudge's notion of 'Historical Empathy'.[265]

Sources Used

The table below shows the archives and databases used and the collections looked at in this thesis:

Archive/Database	**Collection**
Hull History Centre, Hull, Yorkshire	The British Union for the Abolition of Vivisection (BUAV)
The Wellcome Library, London	The Research Defence Society (pro-vivisection group),
The National Archives, London	War Office, Cabinet Office, Home Office
Hansard, online	Debates in Parliament and the House of Lords
Primary Sources: Journal articles published in the time period covered	British Medical Journal
Other Primary Sources: Books	*UFAW handbook on the Care and Management of Laboratory Animals* (1st and 2nd edition), Hans Selye books, *The Stress of Life*, Conference publications: Stress and Psychiatric Disorder, The Assessment of Pain in Man and Animals, UFAW pamphlets, UFAW The Principles of Humane Experimental Technique

Effective research requires significant use of primary sources.[266] The archives and collections listed above comprise of a wide variety of documents that contributed to the shaping of the stories told in chapters three to five. Secondary sources have been used to aid contextualisation of the primary sources and help to answer the research questions.[267] I have drawn on government documents, social movements' and medical bodies' documents, books, pamphlets, conference papers, journal articles, as well as newspaper sources from both the broadsheet and tabloid press (these are used sparingly).

[265] Ibid. Fudge, "What Was It Like to Be a Cow? History and Animal Studies." P.
[266] Danto, *Historical Research*. p.60.
[267] Ibid.

Regular trips were made to these archives. It is important to note that my initial ideas on the topic of animal experimentation soon took shape and became more focused once I had visited the archives. As historian Michelle King observes:

> We go to the archives not to find answers, but to articulate a better set of questions. Answers in the archives – in the form of documents – always abound; the real difficulty lies in figuring out what questions to ask of them.[268]

My own encounter with the archives and the documents they yielded brought me to the realisation that how the information presented within them, particularly the government documents from The National Archives, was just as important as their content. I soon became interested in other documents that were linked to the initial ones I was viewing; this is what King calls the 'archival matrix'.[269] For instance, my initial foray into the archives was to look at Home Office files regarding the 1965 Littlewood Report (see chapter five), this soon led me to files connected to this one, where names, dates and places of apparent incidence or a particular event occurred, such as documents from the War Office and Cabinet Office. Subsequently, this then gave me a trajectory to follow concerning animals and war (chapter three). Once this occurred I set my limits through the scouring of the archives, and this was done via the topics that emerged from my 'fieldwork'. As King notes, 'out of sheer necessity, we narrow our searches by using topical or other indices, or by selecting a series of chronological files to consult'.[270] Documents that mentioned specific named events such as 'Operation Cauldron', 'The 1876 Cruelty to Animals Act', 'The Medical Research Council: Animal Experiments', gave me areas to start digging, shaping and focussing my research. Again, I quote King in saying 'identifying one relevant archival document often lead back to a string of others, embedded as they were into existing bureaucratic paper trials at the moment of their creation'.[271]

My trips to archives across the UK helped to shape my thesis, its time period and a series of focused topics to write about. It is the primary source that is considered to be the *sin qua non* of historical research, and for those historians who are 'archive positivists';[272] they

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[268] Michelle King, "Working with/in the Archives," in *Research Methods for History*, ed. Simon Gunn & Lucy Faire (Edinburgh: Edinburgh University Press, 2012). p.20.
[269] Ibid. p.21.
[270] Ibid. pp.21-22.
[271] Ibid. p.22.
[272] Fulbrook, *Historical Theory*. p.100.

are the places where 'historical facts' can be revealed to the historian.[273] However, with the advent of postmodernism, the sources themselves have been brought into question, regarding their validity and credibility.[274] This is called 'source criticism', and involves assessing the sources for their integrity, asking questions concerning the authors of the texts, who the texts were written for, their implicit biases, and the date and context it was written.[275] Most of the time the actual archive determines the validity of the source, in my case The archives, and the archivists themselves have adjudged the authenticity of the documents they catalogue.[276] Secondly, to validate the sources I have used, I have introduced them in my chapters, including who wrote them, where they were from (i.e. Home Office), and the positions of those who wrote the file.[277] Further in order to allow for 'source transparency', I have made extensive use of footnotes in each chapter, this helps with 'linking claims and evidence back to specific sources and documents'.[278] In the footnotes I have described the source, including the name of the person/institution who has written the document, the date it was written, the name of the persons/organisation it was intended for. Also, I have noted the name of the archive, the box number (if appropriate), the name of the file and its number.[279]

However, there is more to 'source criticism' and the historical method, than the abovementioned, and the key lies in the interpretation and re-presentation of the sources. There are two points which I shall discuss in the next section regarding sources and the nonhuman animal. Firstly, the idea of the 'indeterminacy' of meaning; in other words, who says our interpretation is better and more 'right' than others?[280] This involves a discussion about how to go about representing (re-presenting even) the past, and imposing some sort of narrative order on it. Secondly, how events discovered in the sources are presented as a story about the past,[281]particularly in relation to histories of the

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[273] Danto, *Historical Research*. p.62.
[274] Ibid. Fulbrook, *Historical Theory*. pp.98-100, 102.
[275] Fulbrook, *Historical Theory*, Danto, *Historical Research*.P.63. Fulbrook, *Historical Theory*. p.100. Kenneth Lipartito, "Historical Sources and Data," in *Organisations in Time: History, Theory and Methods*, ed. Marcelo Bucheli & Daniel Wadhwani (Oxford: Oxford University Press, 2013). p.7.
[276] Danto, *Historical Research*. p.63.
[277] Matthias Kipping, Daniel Wadhwani, and Marcelo Bucheli, "Analysing and Interpreting Historical Sources: A Basic Methodology," in *Organisations in Time: History, Theory, Methods*, ed. Marcelo Bucheli and Daniel Wadhwani (Oxford: Oxford University Press, 2013). p.14.
[278] Ibid. p.16.
[279] Ibid.
[280] Fulbrook, *Historical Theory*. p.103.
[281] Ibid. p.103.

nonhuman. This is discussed in light of the narrative approach and periodisation of the thesis.

Analysis and Interpretation

For me, to write a history of animals is to acknowledge the role of postmodernism in historical story making. The idea is to read *for* the animal. For instance, in my focus on biological warfare trials, to read for the animal I had to alternatively focus on specific incidences concerning experimental animals written in the documents provided. Other historians who have focused on the same biological warfare trials have not done this, instead, drawing on the normative reading of the documents and not the 'alternative' ones. I had to pay attention to what postmodernists call 'ruptures' and 'absences' in the texts in order to seek out the animal where they had burst forth into existence (see chapter three for an example of this concerning scientists' disdain for the use of sheep as experimental animals), and where previously they had been made invisible in historical research.

It is no surprise then that this reading for the animal in the sources means paying attention to discourse.[282] As Fulbrook argues, we can't escape from paradigms or our own implicit theoretical frameworks.[283] Sources do not 'speak for themselves' but are rather coming from a 'pre-interpreted reality' that is based on the researcher's own philosophical, theoretical and conceptual assumptions.[284] But, my postmodern 'cat's cradle' of theoretical influence does not mean that I am purely viewing the animal as textual, and claiming that they did not undergo these experiments because, as a true postmodernist would say, nothing is 'historical fact'. Rather, by embracing the material-semiotic, being cautious of the role of the researcher and their implicit/explicit theoretical framework, the centring of the animal in historical research can open-up the discipline to new and multiple ways of viewing the past, as Fulbrook argues:

> Conceding that there is no single, unified 'past as such', and that many stories are possible, does not logically entail accepting that there is no way of saying whether or not some stories are more plausible than other, or that all 'readings' may be equally valid. Clearly there are issues of indeterminacy here; the historian plays an

[282] Ibid. p.104.
[283] Ibid. p.109.
[284] Ibid.p.104.

> active role in shaping, interpretation, contextualising, and even ultimately 'emplotting' the story: but this story is developed as a series of answers to specific questions…which [in the end] allows the development of bridges between lost aspect of the past and diverse accounts in the present.[285]

Animal historians, as noted previously, have also argued for the recognition of the importance of the role of the historian in animal-human historiography.[286] This means paying attention to *our intentions,* and the choices we make during the course of our research, and more importantly in the sources' interpretation and (re-)presentation. I hope that my intentions have been made clear, with regards to the 'cats cradle' of theoretical frameworks I have adopted in this research.

The three theoretical frameworks; socio-cultural histories, feminist animal studies, and feminist science studies, have informed my research in term of the interpretation of the sources. However, how did I get from sources to a theoretical informed interpretation of them? This is more about modes of representation or form rather than content. My procedure for re-presentation/analysis was similar to that of coding for qualitative interviews: identifying prominent themes in the texts and making connections between the events recorded in the documents.[287] Moreover, presenting these themes derived from the sources in a coherent manner meant attending to narrativity i.e. addressing the form not content of the thesis.

By attending to narrativity or story telling has meant paying attention to several aspects of representing the past, most importantly the ability to contextualise the themes and specific incidences collated from my archival research. As Fulbrook pertinently puts it 'the most tedious histories are perhaps those which make no effort to evoke a sense of context'. [288] By attending to the broader social and cultural context of the animal experiments discussed in this thesis, it not only provides atmosphere but helps to 'set the scene' and gives reasons as to why these experiments were being done in the first place, and therefore making the whole project more meaningful and significant.[289] This further helps to avoid 'the dangers of anachronism' in the application of the theories and

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285 Fulbrook, *Historical Theory*. p.108.
286 Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?." p.S64.
287 Kipping, Wadhwani, and Bucheli, "Analysing and Interpreting Historical Sources: A Basic Methodology." p.8.
288 Fulbrook, *Historical Theory*. p.161.
289 Ibid.

concepts used to analyse human-animal laboratory relations.[290] To do this, Fudge argues we have to keep the historical 'worldview', as she terms it (or broader context), our research is situated 'to the fore in our analyses even as we acknowledge the nature of the worldviews we are using to help us to interpret them'.[291]

Secondly, is the idea of 'emplotment', or the organisation of the narrative to aide contextualisation and delineate the major protagonists of the story.[292] Historians re-present the past, and transfer the sources researched into viable stories for analysis, therefore, to 'emplot' or characterise the history as a form of literary genre (tragedy, theatrical horror even!) while not taking away its historical significance, has been one of the major aims of this thesis in terms of its shaping and form (not content).

This idea of narrative form fits in with the overall methodological aims of the thesis (its content), as it does not only relate to my imposition of a story about the past using the sources garnered about my particular topic; but it also it has a great deal to do with paradigms and the theoretical frameworks drawn on.[293] Narrative re-presentation of sources reflect the ideals of socio-cultural histories and feminist approaches to research, as it allows for the details of experience of a particular group of people, and animals in my case, to be exposed.[294] Moreover, it reveals the stories that scientists have told each other, and to members of the public, about animal experimentation to be revealed in what are called 'narrative practices' of that particular time period, and cultural context.[295]

In other words it makes visible the stories people 'tell themselves about themselves' in relation to animals and their use in scientific research. This reveals more about the behaviour and characteristics of the nonhuman than just simply attending to a discursive representation. Fudge argues for a turn to the work of scientists and more specifically ethologists to help with representing the nonhuman in history, however this is inflected by the social and cultural values of the present, and contradicts her cautionary advice concerning anachronism (see above).[296] It is through emplotment and paying attention

[290] Fudge, "What Was It Like to Be a Cow? History and Animal Studies." p11.
[291] Ibid. p.12.
[292] Burke, *What Is Cultural History?* pp.82-83. Fulbrook, *Historical Theory*. p.156.
[293] Fulbrook, *Historical Theory*.Fulbrook p.159.
[294] Burke, *What Is Cultural History?* p.126.
[295] Ibid. p.124.
[296] Fudge, "What Was It Like to Be a Cow? History and Animal Studies." pp.8-9.

to form as well as content that I am able to detail the experiences of the nonhuman animal, and re-present them as such. This then enabled me to analyse the narratives for discourses of power-knowledge, and the intersectional nature of animal experimentation.

Moreover, when paying attention to form as much as content, we have to pay attention to time period and chronology of the thesis. How to re-present the past meant attending to the chronological parameters of the thesis. In order to form a narrative out of the sources used, I had to focus my research over a particular time period. This is discussed below.

Periodisation

> We have not to date been particularly well served by the history of animals in the twentieth century… [and] sometimes it seems as if there is a gap between the death of Queen Victoria and the arrival of Peter Singer…Key areas that redefine human-animal encounters in the twentieth century, are still underexplored.[297]

As Jonathan Burt rightly points out, animal histories written about the twentieth century are particularly few and far between. The dates for this piece of historical story-telling, may seem at first glance to be somewhat random. However, as stated previously, my methodological standpoint is firmly placed in the inductive realm of the conduct of research. These specific dates, 1947-1965, emerged from my immersion in the historical sources. Initially I read through newspaper databases to get a glimpse into the popular stories surrounding animals of the day. I found the most interesting stories were on animal experimentation, and cases in the press about the USA and USSR space race.

The representations in the British press surrounding the use of animals in space lead me on to reports in the press about the Littlewood Inquiry and the review of the 1876 Act. This then lead me to The National Archives, where I consulted government sources related to the Review, which in turn further lead me to Porton Down (chapter four) and the Medical Research Council (chapter five) and the Research Defence Society (at the Wellcome Library, London).

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[297] Burt, "Invisible Histories: Primate Bodies and the Rise of Posthumanism in the Twentieth Century."pp. 159-160.

Furthermore, in terms of this chronological framing of starting in 1947 and ending in 1965 as being guided by the sources, it should be noted that the date of 1947 was chosen for a particular historical reason. It was in 1947 that the first biological warfare sea trails got underway by Porton Down microbiological research scientists (see chapter four). This was the beginning of a whole new era of military research and scientific endeavor[298] through the use of animals. Britain was at the time still engaged in military combat abroad in Indo-China (Indonesia), and propping up the dictatorship of the Sultan of Oman.[299] The Cold War was just about to begin with tensions raising between the USA and former USSR with the resultant threat of imminent nuclear fallout. Britain was losing its grip on Empire, including the newly independent country of India, and the spectre of the Second World War still haunted the corridors of Whitehall and its associated military departments and personnel. I end in 1965 after the conclusion of the review of the 1876 Cruelty to Animals Act, as it brings to a suitable close an important juncture in animal history. That of the review of the law and the precursors to the rise of the Animal Rights movement in the 1970s (which incidentally is beyond the scope of this thesis – see introduction for limitations).

Therefore, it can be stated that I chose these dates for two reasons; my inductive research strategy, with the historical primary sources guiding my time period. And, the social and political processes of the day. This may be not a 'traditional' methodological strategy in the discipline of history, but this is not a 'traditional' thesis. And, it is important to consider at this point the role feminism has had in influencing the justification for the periodization of this thesis.

Feminist Histories and Periodisation

It was feminist historians who first problematized the concept of time in historical research. The feminist Joan Kelly-Gadol discusses this in her 1987 paper *The Social Relations of the Sexes: Methodological Implications of Women's History*. She troubles the concept of periodization by arguing for the inclusion of gender as a category of analysis in historical research. She contends that if one writes a history that focuses on the

[298] Brian Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare* (Surrey: Ashgate Publishing Ltd, 2012).
[299] Ian Cobain, *The History Theives: Secrets, Lies and the Haping of a Modern Nation* (London: Portobello Books, 2016). See pages 64-81 especially.

positions women hold in society, and the status thus ascribed to them, this will transform the chronological purview of historical research,[300] and the period being studied 'takes on a wholly different character or meaning from the normally accepted one'.[301] This unsettling of historical periods challenges the fundamental way historians write about historical periods, although Kelly-Gadol does not include other differences such as species difference, she contributed to the decentering of fixed historical periods in normative historical research, which she claims is fundamental androcentric.

This idea of feminist periodization chimes with Fudge's concern regarding the writing of animal histories, as she claims that 'animals have no sense of periodization', therefore the writing of a history centred around the animal needs a very different way of organizing the structure of time.[302] In that way, Hilda Kean argues, we are not just "writing in" the history of animals into existing frameworks, but rather the particular historical periodization, once centred around the animal, contributes to acknowledging the 'animal presence' so as to 'disrupt and challenge conventional ways of seeing'.[303] This thesis follows the lead of animal historians, Fudge and Kean. It is centred on nonhuman experimental animals, starting in 1947 when the first biological weapons testing was undertaken and finishing in 1965 with the publication of the Littlewood Report, the review of the 1876 Cruelty to Animals Act. This periodization is grounded in the events that had an impact on the nonhuman animal; hence this history stems directly from, and is shaped by, the very evidence collected about animal experiments in mid-twentieth century Britain. It is with this structure of periodization, generated from the archival evidence itself, that allows for 'dramatic new perspectives [to] unfold from [this] shift of vantage point':[304]

> What feminist historiography has done is to unsettle such accepted evaluations of historical periods. It has disabused us of the notion that the history of women is

[300] Joan Kelly-Gadol, "The Social Relations of the Sexes: Methodological Implications of Women's History," in *Feminism and Methodology*, ed. Sandra Harding (Indiana: Indiana University Press, 1987). p.16.
[301] Ibid. p.16.
[302] Fudge, "A Left-Handed Blow: Writing the History of Animals." p.6.
[303] Kean, "Challenges for Historians Writing Animal-Human History: What Is Really Enough?." pS65.
[304] Kelly-Gadol, "The Social Relations of the Sexes: Methodological Implications of Women's History."pp16-17.

> the same as the history of men and that significant turning points in history have the same impact for one sex as for the other.[305]

Where Kelly-Gadol spoke about the role of feminism in historical writing and its periodization, this idea has been extended in this thesis to account for nonhuman animals as well as gender relations in a certain historical time period.

Historical Empathy

The final aspect of re-presenting the past through the sources I have used in this thesis relates to the role of the researcher. This is clearly not a history that rests on the assumptions laid out by positivists, their belief in objectivity and historical fact (naive realism). Rather, my research is firmly within the domain of the political and hopes to evoke empathy. This makes the practice of history ethical and the theoretical paradigms used in this thesis are used as political tools to (hopefully) help render visible the lives of more-than-human actors in scientific research. As Fulbrook explains:

> all historical writing is necessarily implicated, if not explicitly laden with issues concerning values, emotions, symbolisation, evocation; historians choose whether or not to write in terms of heroes and villains; they choose whether or not their characterisations should evoke sympathies for one side or another, [or] empathise better with certain viewpoints than others.[306]

All research is affected by the values and emotions of the researcher. How I have chosen to re-represent this aspect of the past is as much tied up with my feelings and ethical beliefs towards nonhuman animals as a scientist writing a similar history to me would inflect it with their values concerning the use of animal in experiment. This isn't a perfect history, as it certainly does not capture the full experiences of the more-than human world in the laboratory. Rather, as Fudge argues:

> Acknowledging the persistence of the human perspective, having an understanding, however limited, of the animals' engagement with the world, and from that position continuing to write animal history…may seem like the best that we can do: after all, an imperfect history is better than no history at all.[307]

This creates historical empathy, not detachment from the stories re-presented by the historian. To engage with the more-than-human in these anthropocentric texts, can be

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[305] Ibid. p.17.
[306] Fulbrook, *Historical Theory*. P.163.
[307] Fudge, "What Was It Like to Be a Cow? History and Animal Studies." P.18.

achieved by using a plurality of approaches to help understand the experiences of them. Centring the history around the animal changes the narrative and its major protagonists, and further, allows the research to attend to the asymmetric power relations which have denigrated the experiences of the nonhuman and have previously escaped the writings of history.

Conclusion

This chapter has advocated the pluralistic approach to the writing of animal histories and the interdependce of theory, epistemology and method. Under the rubric of Donna Haraway's 'Cat's Cradle' approach I have promulgated the idea of the use of several approaches: socio-cultural histories, feminist animal studies and feminist science studies, and their associated concepts, to write a history that is animal-centred. These three approaches are the theoretical framework of my thesis. They form the methodological backdrop to the research. The technique, then, is firmly grounded in the use of a variety of historical sources, which have been re-presented in narrative form by the author. Narrativity has been used to facilitate the analysis of the documents for historic power-knowledge relations concerning nonhuman and human animals in the laboratory. The next three chapters display this methodological approach. We start with the story of animal experimental science in Britain, 1947-1965, with an examination of the secret biological warfare trials that took place at Porton Down military research establishment in the late 1940's to the mid-1950s.

Chapter Four

Animal Experimentation at Porton Down: Britain's Military-Animal-Industrial Complex, 1948-1955

The funniest thing, according to J. D Morton, the scientific trials officer at Porton Down Chemical and Biological Defence Research Establishment in 1952, was the fact that monkeys could possibly have rights. In his narration over a grainy 1952 film about a secret experiment conducted off the coast of Scotland, Morten joked about the experimental monkeys. He highlighted the behaviour of one particular monkey in the film who was seen to be moving frantically about in his cage, and wryly exclaimed: 'He's obviously a political agitator, haranguing the rest about the rights of monkeys, though they're only paying casual attention to him!'[308] This passing comment, made with a sense of humour, may seem odd to the contemporary reader. Where is the humor in expressing that monkeys *may* possible have rights? As the noted cultural historian Robert Darnton[309] claims, '[w]hen we cannot get a proverb, or a joke, or a ritual, or a poem, we know we are on to something'[310]. The perception of this event from a distance might serve as a starting point in understanding the culture of military animal experimentation in Britain at this point in time.

Overall, this chapter is indicative of the broader aim of this thesis, as it explores the tenets of science in terms of the material practices in the laboratory and philosophical underpinnings of its methodologies. In this chapter I take one important but neglected facet of mid-twentieth century British science, that of military science and animal experiments. I want to explore this seemingly trivial and humour-filled relationship between the human and nonhuman, by focusing on the use of nonhuman animals in British biological warfare trials. Here, I shall argue that not only was Britain creating an immense military-industrial complex in this era in order to compensate for its loss of Empire and steady economic decline since the Second World War, but it was also creating a military-*animal* industrial complex[311]. This term is a composite of the military-industrial complex, a term that has become popular in academic literature since its use by former US President, Dwight Eisenhower in 1961, and Barbara Noske's animal-industrial

[308] http://www.youtube.com/watch?v=CPA_yce0Swg [accessed 12/05/14)
[309] Robert Darnton, *The Great Cat Massacre and Other Episodes in French Cultural History* (New York: Basic Books, 1984).pp.75-104.
[310] Ibid.p.5.
[311] Anthony J. Nocella II & Judy K. C. Bentley Colin Salter, ed., *Animals and War: Confronting the Military-Animal Industrial Complex* (Lexington Books, 2014).

complex in 1989[312]. To help elucidate this concept, I will be drawing on the work of Lisa Johnson and her Foucauldian inspired book *Power, Knowledge, Animals.*[313] Here, Johnson, analyses power-knowledge relations in light of contemporary approaches to nonhuman animals through what she terms the discourse of law and the discourse of lines.[314] I will be using this conceptual apparatus to illustrate Britain's emerging military-animal-industrial complex via the work of the Porton Down scientists and their experiments on animals.

Sources and Archives: Britain's Secret Military History

I would like to make a brief note at the start of this chapter to signify the complexity of uncovering the primary source material used in the construction of this chapter. Not surprisingly many of these documents about the biological warfare trials were once considered to be Top Secret or Secret. The documents used and looked at, at The National Archives tended to be single government files containing several documents amongst other sources that were irrelevant. Or, they were a short series of documents, each containing particular incidents such as accidents or policy disputes.

The policies, plans, reports, memoranda, minutes and correspondence in the documents used in this chapter were all written at the time under the auspices of The Official Secrets Act 1911, and produced at a time when a culture of secrecy permeated Whitehall and its associated departments and personnel.[315] This made it illegal, until now, for government workers to communicate this information to the outside world. Yet, as historical sociologist Brian Balmer points out, the sources are still extremely insightful but they:

> Must be read and interpreted as official sources, frequently performing a rhetorical function within Whitehall, such as recording 'in stone' the final outcome of a more submerged and uncertain process of negotiation and decision-making, or trying to persuade colleagues of a point of view or course of action.[316]

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312 Colin Salter, "Introducing the Military-Industrial Complex," in *Animals and War: Confronting the Military-Animal Industrial Complex*, ed. Anthony J. Nocella II & Judy K. C. Bentley Colin Salter (Lexington Books, 2014). PP.1-17, Noske, *Beyond Boundaries: Humans and Animals*. pp. 22-39.
313 Johnson, *Power, Knowledge, Animals*.
314 Ibid. pp.41-62 & pp. 142-150.
315 Cobain, *The History Theives: Secrets, Lies and the Haping of a Modern Nation*.pp.20-29. Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*.p.15.
316 Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*. P.15.

So, reflexively speaking, my account itself becomes a form of revealing the secret or 'hidden' histories of biological warfare and the British state. I have pieced together this story from a huge number of archival documents, many of which were closed until recently and not written specifically to create a historical record (for instance the detailed expositions on animal post-mortems after infection with a biological agent). Therefore, this account is just one window of transparency through which we can understand the previously withheld (Top Secret) activities of the British government.

Legal and Linear Discourses

The discourse of law outlines the notion of that which is socially, culturally and politically permitted in terms of animal experimentation, and helps create a reality within which animals become objects of scientific enquiry. Johnson asserts that the discourse of law conveys a language imbued with meanings that attribute a property status to animals, rather than constructing the nonhuman as a living being.[317] It is this language that carries authority and power, and the people who convey this knowledge hold powerful positions that ascribe status and truth to their practices within the confines of law.[318] Law, government and military science in mid-twentieth century Britain were intricately bound together in networks of power-knowledge which sanctioned the practice of animal experimentation through the support of the law. It is this understanding of animal experiment law that leads to my next conceptual undertaking, that of Johnson's discourse of lines.[319] Lines split the nonhuman body into parts, and this demarcation of the physical body of the nonhuman into specific parts constructs what is understood to be knowledge and truth about animal bodies (see figure one for example).

[317] Johnson, *Power, Knowledge, Animals*. p.41.
[318] Ibid. p.42.
[319] Ibid. p.56-62.

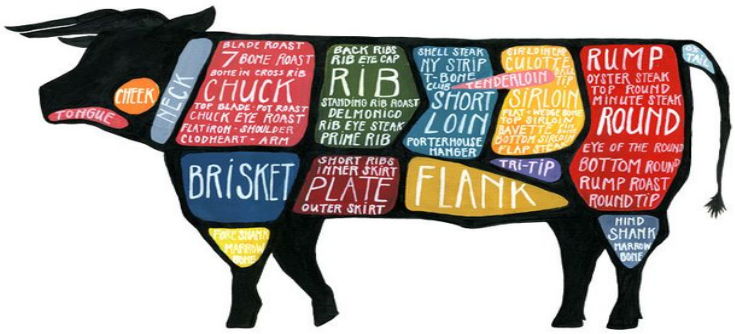

Figure 1: detailed cow butcher diagram showing the imposition of "lines" onto the animal body, ready for it to be cut into pieces.[320]

The lines are abstractly placed upon the whole of the nonhuman body by the human, whether scientist or butcher, in order to dissemble it:

> While language itself partitions, the discourse of lines is a discourse comprised of linear objects superimposed upon abstract representations of a physical object or event. Lines themselves are not words. Words are used to describe lines, but lines are not words. The discourse of lines is one that conveys knowledge through the use of lines.[321]

This conceptualization wrought by the discourse of lines is useful when analyzing the way that the Porton Down scientists created knowledge about the nonhuman through their post-mortem examinations, which will be explored further on in the chapter. This is also true when considering parallel discourse about the role of women at the time. The law positioned women as objects and, like the nonhuman, had the status of property, rather than as active agents in their own right (also see chapter six).[322] Scientific methodologies and the discourse of lines helped strengthen this normative construction of women, and as we shall see, the philosophy of science contributed to a discriminatory form of practice that subjugated women and animals, and which placed them in entangled 'Otherness'.

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[320] Pinterest, *Butchering* ([cited 26/10/16); available from https://www.pinterest.com/melindaboumans/butchering/.
[321] Johnson, *Power, Knowledge, Animals*.p.56.
[322] Ibid. p.142.

This argument is explored in three parts, beginning with an analysis of the major biological warfare trials led by British scientists in the late 1940s to the mid-1950s in relation to debates about law. These trials were conducted at sea but in areas close to human populations. Thousands of nonhuman animals were used, infected with deadly pathogens, and killed in order for Britain to produce weapons of mass destruction. The second section shows how these trials reproduced discourses of power over the life and death of nonhuman animals, with a focus on the precise methodologies used for carrying out post-mortems on infected animal corpses. Moreover, I will be highlighting the intricate networks of power embedded in the very methodologies of biological warfare research practices. Finally, this chapter will end with a discussion about the philosophical underpinnings of the scientific methodologies associated with biological warfare research. I will be drawing on the work of ecofeminists such as Val Plumwood and Donna Haraway, and feminist science studies scholars, Sandra Harding and Evelyn Fox-Keller, to elucidate the intricate and covert webs of power, which underpinned scientific practice in mid-twentieth century Britain.

Previous literature

Not many scholars have attempted to address the issue of animal experimentation in, the Chemical and Biological Defence Establishment (CBDE) at Porton Down, Wiltshire, one of Britain's most noted (albeit 'top secret') military establishments. There are a number of scholars who have addressed biological and chemical weapons research at Porton Down but in the area of ethics and human experimentation, led by the work of Ulf Schmidt and Brian Balmer, and policy and politics of the CBDE and chemical and biological warfare more broadly[323] with Brain Balmer, Mark Wheelis, Lajos Rózsa and

[323] Brian Balmer, "The Drift of Biological Weapons Policy in the Uk, 1945-1965," *The Journal of Strategic Studies* 20, no. 4 (1997)., Brian Balmer, "Killing 'without the Distressing Preliminaries': Scientists' Defence of the British Biological Warfare Programme," *Minerva* 40, no. 1, Special Issue: Ethics and Reason in Chemical and Biological Weapons Research (2002), Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*, Brian Balmer, "The Uk Biological Weapons Programme," in *Deadly Cultures: Biological Weapons since 1945*, ed. Lajos Rózsa Mark Wheelis, & Malcolm Dando (Cambridge M.A. & London U.K.: Harvard University Press, 2006).PP.47-83. Ulf Schmidt, "Cold War at Porton Down: Informed Consent in Britain's Biological and Chemical Warfare Experiments," *Cambridge Quarterly of Healthcare Ethic* 15, no. 4 (2006), Ulf Schmidt and Andreas Frewer, ed., *History and Theory of Human Experimentation: The Declaration of Helsinki and Modern Medical Ethics* (Stuttgart: Franz Steiner Verlag Wiesbaden GmbH, 2007), Ulf Schmidt, "Medical Ethics and Human Experiments at Porton Down: Informed Consent in Britain's Biological and Chemical Warfare Experiments," in *History and Theory of*

Malcolm Dando taking the lead in this respect. The problem with this is that the focus is very much placed on the human experiments that took place there, with the very significant use of animals in the development of weapons of mass destruction mentioned only occasionally. For instance, although Ulf Schmidt dedicates two pages, two photographs and a graph to demonstrate the significance nonhuman animals had for Porton Down and their use in chemical weapons testing,[324] he in no way addresses the social construction of animals within this complex and often contradictory terrain of military science. In fact, he insists that 'in the immediate postwar period concern about animal welfare was regarded as of low priority, given the existential pressures to rebuild war-torn towns and lives'.[325] However, as we shall see in the next two chapters, concern for animal welfare both publically, via the newspaper press and campaign organisations such as the British Union for the Abolition of Vivisection, and privately within the scientific research world, *was* substantial, with the likes of organisations such as the Universities Federation for Animal Welfare (UFAW) publishing key textbooks and papers on the welfare and housing of experimental animals in the immediate period after the Second World War.[326] Furthermore, Schmidt's work is ultimately very politically benign and fails to substantially challenge the historicity of power and politics, and more importantly, the power-saturated forms of scientific knowledge that led to the formation of the military-animal-industrial complex in Britain.

The only attempt made by an academic to address the importance of research animals in the development of biological weapons is Elizabeth Willis.[327] Willis' paper covers the major sea trials in the postwar period that took place off the coast of Scotland and later, in the Caribbean. But, her work lacks much needed focus, critical insight and still positions nonhuman animals as secondary to the overriding narrative of the correspondence between scientists and various associated government departments. Therefore, this begs the question as to why military scholars fail to consider the essential role played by nonhuman animals in the development of Weapons of Mass Destruction

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Human Experimentation: The Declaration of Helsinki and Modern Medical Ethics, ed. Ulf Schmidt & Andreas Frewer (Stutgart Franz Steiner Verlag Wiesbaden GmbH, 2007), Ulf Schmidt, *Secret Science* (Oxford: Oxford University Press, 2015).

[324] Schmidt, *Secret Science.* pp.48-52.

[325] Ibid. p.179.

[326] Alastair N Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*, 1st ed. (London: Bailliere, Tindall And Cox, 1947).

[327] Elizabeth A Willis, "Seascape with Monkeys and Guinea-Pigs: Britain's Biological Weapons Research Programme, 1948-1954," *Medicine, Conflict and Survival* 19 (2003).

(WMD). Further, why is it that historians neglect and are reluctant to explore the very ideologies used by military scientists to justify their research on animals?

In addition to this scholarly work there is a body of journalistic and popular science literature. Much of this writing also focuses on the contentious and unethical human experiments that took place there during the inter- and post-war years.[328] Furthermore, these works express animal experimentation as a necessary part of biological and chemical warfare testing. In addition, they fail to address concerns about the perceptions and use of the many different species of animals within the context of British chemical and biological defence experiments in this era.

It is obvious then that most scholars and/or journalists will focus their writings on the human experiments that took place at this establishment. This included experiments conducted on humans for the testing of nerve gases and the hallucinogenic drug LSD.[329] Yet, until recently, the use of animals *for* and *in* war has been paid scant attention nor been systematically analysed.[330] In contrast to the current academic and popular literature regarding CBDE, this chapter focuses on the biological warfare animal experiments that took place there from 1948-1955. It was during this time that policy-making decisions in government were made through the co-option of scientists and 'experts' in the fields of business and the military.[331] They acted as key advisors to politicians in areas pertaining to the military, industry and medicine. Amongst those approached by the government department the Ministry of Supply (MoS) was Lovatt Evans, a physiologist and very vocal opponent of the anti-vivisection movement. Other prominent people who were Fellows of the Royal Society, such as Paul Gordon Fildes and David W. W. Henderson.[332] Therefore, the state had intimate links with business and science,[333] and

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328 Rob Evans, *Gassed: British Chemical Warfare Experiments on Humans at Porton Down* (London: House of Stratus, 2000), John Parker, *The Killing Factory: The Top Secret World of Germ and Chemical Warfare* (London: Smith Gryphon Ltd, 1996), Robert Harris & Jeremy Paxman, *A Higher Form of Killing: The Secret History of Chemical and Biological Warfare* (London: The Random House Group Ltd, 2002).

329 Evans, *Gassed: British Chemical Warfare Experiments on Humans at Porton Down*. pp193-196 & pp231-260.

330 Andrew Tyler, "Preface," in *Animals and War: Confronting the Military-Animal Industrial Complex,* , ed. Anthony J. Nocella II & Judy K. C. Bentley Colin Salter (Plymouth: Lexington Books, 2014). P.xv.

331 David Edgerton, *Warfare State: Britain, 1920-1970* (Cambridge, UK: Cambridge University Press, 2006), Frank Mort and Chris Waters Becky Conekin, ed., *Moments of Modernity?: Reconstructing Britain, 1945-64* (Rivers Oram Press, 1999). Schmidt, *Secret Science*.pp103-115.

332 Schmidt, *Secret Science*. pp103-110.

scientists became complicit in the decisions affecting the nation. With this in mind, money not only was directed into the welfare state, but also, into the creation of a vast military-industrial complex.[334] Military science received very large sums of money that increased exponentially in the post-war period, with warfare spending accounting for over 30% of public expenditure in the early 1950s.[335] Military spending needed large-scale investment into research and development (R&D) programmes. This amounted to a £250 million investment into defensive and offensive scientific and technological research during wartime.[336] Britain was spending a higher proportion of their material and financial assets in defence R&D than anywhere else in the world at this time.[337] Animals played a significant role in this and animal experimentation for biological warfare flourished. As shall be shown, the state and scientists worked together to compete in a bipolar world of ever advancing technologies that enhanced human health and welfare[338] but which also threatened our existence.[339] In this context, Britain created its very own military-animal-industrial complex.

The Military-Animal-Industrial Complex

The military-industrial complex comprises a partially impervious set of networks between the economic sector (industrial bases that support the military), governments and scientific domains in a given society.[340] This relationship includes political contributions and approval for military spending.[341] The term originated as a reference to the US military system, but as we shall see is equally applicable to Britain.[342] With regards to this, David Edgerton's account of the British warfare state, 1920-1970, is relevant.[343] According to Edgerton, the historiography of the development of state militarism in

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333 Becky Conekin, ed., *Moments of Modernity?: Reconstructing Britain, 1945-64*.
334 Edgerton, *Warfare State: Britain, 1920-1970*. p.1.
335 Ibid. p.61.
336 Ibid.
337 Ibid.
338 Edgerton, *Warfare State: Britain, 1920-1970*. Jon Agar, *Science in the Twentieth Century and Beyond* (Cambridge, U.K. and Malden, M.A.: Polity Press, 2012). pp.302-303.
339 Agar, *Science in the Twentieth Century and Beyond*. pp302-303.
340 Richard Twine, "Revealing the 'Animal-Industrial Complex' – a Concept & Method for Critical Animal Studies?, Journal for Critical Animal Studies, Vol 10 (1). P. 8.," *Journal for Critical Animal Studies* 10, no. 1 (2012). p.8.
341 Agar, *Science in the Twentieth Century and Beyond*.p. 339.
342 Ibid.
343 David Edgerton, *Warfare State, Britain, 1920-1970*, (Cambridge: Cambridge University Press, 2006) Edgerton, *Warfare State: Britain, 1920-1970*.

Britain remains sparse. Furthermore, 'in all the vast commentary on the British state, there is hardly even an allusion to the 'military-industrial complex'[344]. I posit, alongside Edgerton, that Britain in this period developed a vast military-industrial complex, albeit one that involved the use of nonhuman animals for the development of biological warfare.

The concept of the animal-industrial complex invoked by Barbara Noske[345] is used in this chapter to suggest that Britain created a military-*animal* industrial complex. It suggests that the 'exploitation of nonhuman animals is natural, ethical and appropriate'[346] and is central to the 'total commodification of the natural world' in the modern industrial system[347]. Noske identifies the roots of this complex in the 'hyper-reductionism'[348] of the modern (capitalist) agricultural labour force alongside 'the mechanized and routinized slaughter of nonhuman animals, and the nonhuman animals themselves'.[349] As a result of Noske's analysis of the agricultural labour force, Nocella *et al* postulate the foundations of a theory in the guise of the military-animal-industrial complex.[350] This includes the mass production of various weapons of war not favorable to human and animal wellbeing, but are nevertheless pursued and exploited in order to persist with economic interests in this area.[351] The use of animals in warfare has a long history but one that has not been analysed from the perspective of the British warfare state. Firstly, I would like to outline the context of British warfare policy and research.

British science and the State

From the interwar to the post-Second World War years Britain became a nation that invested heavily in military science and technology[352]. This increase in funding was twentyfold from the period 1938-9, to its peak during the Second World War. In relation

344 Ibid. p. 9.
345 Noske, *Beyond Boundaries: Humans and Animals*. pp.22-39.
346 Ibid. p22. & see Salter, "Introducing the Military-Industrial Complex." p.4.
347 Noske, *Beyond Boundaries: Humans and Animals*.p.36 Salter, "Introducing the Military-Industrial Complex." p.5.
348 Noske, *Beyond Boundaries: Humans and Animals*. p.37 Salter, "Introducing the Military-Industrial Complex." p.5.
349 Salter, "Introducing the Military-Industrial Complex."p. 5.
350 Colin Salter, ed., *Animals and War: Confronting the Military-Animal Industrial Complex*.pp.1-17
351 Twine, "Revealing the 'Animal-Industrial Complex' – a Concept & Method for Critical Animal Studies?, Journal for Critical Animal Studies, Vol 10 (1). P. 8.."p. 12.
352 Edgerton, *Warfare State: Britain, 1920-1970*.p 60. Agar, *Science in the Twentieth Century and Beyond.*

to gross domestic product, defence spending was three times greater in the 1950s than in the 1930s.[353] This resulted in a science of war that encompassed the development of chemical and biological weapons, as well as the newfound atomic science in the form of the nuclear bomb.[354] The Cold War 'military-industrial complex' became the new context for British science to develop in. As Edgerton has argued, not only was Britain entering into an era of state control over the welfare of its population, but was also entering into an era that focused on the development of a 'warfare state'.[355]

At this time warfare spending grew a great deal more than welfare spending, comprising over 30% of public expenditure in the early 1950s.[356] This implied that military spending needed large-scale investment into research and development (R&D) programmes. Accordingly, this amounted to a £250 million investment into defensive and offensive scientific and technological research during wartime.[357] Incidentally, Britain was spending a higher proportion of their material and financial assets in defence R&D than anywhere else in the world at this time.[358]

Specialist departments were created and these required more technical experts in place of the bureaucrats and politicians that existed in previous governments.[359] At the most senior managerial levels military *men* had roles in controlling the funding allocation of R&D, as well as in supply of weapons, via the newly created Ministry of Supply (MoS) in 1939 by the Chamberlain government.[360] These important changes gave the new 'technical' experts greater power and influence at many levels of government; consequently many were appointed important ministerial positions.[361] Moreover, scientific state workers multiplied more than three times between 1931-1951.[362] And scientists were called upon by the British government to provide advice on biological,

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353 Edgerton, *Warfare State: Britain, 1920-1970*. P.66.
354 Ibid. John R Walker, *Britain and Disarmament* (Surrey: Ashgate Publishing Limited, , 2012).Brian Balmer, "The Uk Biological Weapons Programme." Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*. Brian Balmer, *Britain and Biological Warfare: Expert Advice and Science Policy, 1930-65,* (Basingstoke: Palgrave Macmillan., 2001).
355 Edgerton, *Warfare State: Britain, 1920-1970*. p. 61.
356 Ibid.
357 Ibid.
358 Ibid.
359Balmer, "The Uk Biological Weapons Programme."
360 Ibid., Edgerton, *Warfare State: Britain, 1920-1970*.
361 Edgerton, *Warfare State: Britain, 1920-1970*.
362 Ibid.

chemical and atomic warfare policy.[363] This was an era where the role of the scientific expert shaped the development of biological warfare policy in Britain.[364] From 1940-1961, biological warfare research became one of the top priorities for the government and this led to the establishment of specific state controlled scientific institutions to develop WMD that could be deployed at short notice.[365]

Biological Warfare and the State

It was not until the 1930s that scientific concern about the dangers of biological warfare (B.W.) became a focus of attention in the corridors of Whitehall.[366] It was in this period that the Government created a Sub-Committee on Bacteriological Warfare of the Committee of Imperial Defence to discuss policy formulations and military strategies of a biological warfare nature.[367] In October 1940, a British research programme was launched at Porton Down led by Dr Paul Fildes, a bacteriologist from the Medical Research Council (MRC).[368] Fildes was given orders to develop a biological bomb that could be used instantaneously if and when the country was attacked.[369] During the war, scientists at Porton Down designed and produced two key biological weapons: an anti-personnel anthrax bomb[370] and five million cattle cakes laced with anthrax to drop on livestock in Germany.[371] After the war, the B.W. programme was expanded and the B.W. department at Porton Down was re-named the Microbiological Research Department (MRD).

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363 Balmer, *Britain and Biological Warfare: Expert Advice and Science Policy, 1930-65,* .
364 Ibid.
365 Balmer, "Killing 'without the Distressing Preliminaries': Scientists' Defence of the British Biological Warfare Programme."pp. 57-75
366 Peter Hammond and Gradon Carter, *From Biological Warfare to Healthcare: Porton Down 1940-2000* (Basingstoke: Palgrave Macmillan, 2002).
367 Ibid.p.60
368 G. B Carter, *Porton Down: 75 Years of Chemical and Biological Research* (London: HMSO Publications, 1992).
369Balmer, "Killing 'without the Distressing Preliminaries': Scientists' Defence of the British Biological Warfare Programme."
370 Ibid.
371 Balmer, "Killing 'without the Distressing Preliminaries': Scientists' Defence of the British Biological Warfare Programme." Piers Millet, " Antianimal Biological Weapons Programs„" in *Deadly Cultures: Biological Weapons since 1945*, ed. Lajos Rozsa Mark Wheelis, Malcolm Dando (Cambridge MA: Harvard University Press, 2006).

In the post-war period state approval ensured the continuation of research into B.W. in peacetime, and more formalised advisory committees were established to supervise B.W. research and policy. One of these was the Biological Research Advisory Board (BRAB) of the MoS, who provided scientific advice on researchable biological problems in relation to weapons development. BRAB were accountable to the Advisory Council on Scientific Research and Technical Development of the MoS, and provided technical advice to the Chiefs of Staff Biological Weapons Subcommittee. This board consisted of a variety of experts from various government departments including people from the MoS, the Home Office and Ministry of Health, as well as independent scientists, the Admiralty, War Office and Air Ministry staff.[372] This subcommittee worked with the Defence Research Policy Committee (DRPC) on the strategy and technical aspects of biological warfare research.[373] B.W. policy became a top priority and the DRPC soon came up with a set of objectives for R&D in this area including research into defensive aspects of war, how to store and produce B.W., and defensive measures to protect the population at large.[374]

In 1946 Dr David Henderson replaced Fildes as superintendent.[375] And as a consequence, the research broadened considerably and ranged from basic experiments in laboratories, to open air trials of dangerous pathogens on land and at sea.[376]. The experiments conducted by Porton Down scientists included the use of thousands of animals and they even had their own farm, Allington Farm, which bred and provided experimental animals for the scientists for their B.W. trials.[377] Most often these were guinea pigs, mice, rats, cats and monkeys.[378] In terms of the B.W. trials, dangerous viruses would be released in order to purposely infect the animals and test their immune response to such pathogenic organisms as the plague virus and anthrax. These experiments were an indicator not only towards the thinking that surrounded biological

372 Millet, " Antianimal Biological Weapons Programs,."
373 Balmer, "The Uk Biological Weapons Programme."
374 Ibid.p. 51.
375 Hammond and Carter, *From Biological Warfare to Healthcare: Porton Down 1940-2000*. p.vii.
376 Millet, " Antianimal Biological Weapons Programs,.", Balmer, *Britain and Biological Warfare: Expert Advice and Science Policy, 1930-65,* , Balmer, "Killing 'without the Distressing Preliminaries': Scientists' Defence of the British Biological Warfare Programme."
377 Schmidt, *Secret Science*. p.49.
378 Balmer, "The Uk Biological Weapons Programme."p.52.

weapons and its position in the development of policies[379], but also, as we shall see, in the development of the military-animal-industrial complex.

Secret Science and the Mysterious Case of "Operation X"

The testing of dangerous pathogens for potential military use had to be kept top secret. Only key Government advisors and military personnel could know about them. The very first post-war biological weapons trial was conducted from December 1948 to February 1949 and codenamed 'Operation Harness'.[380] The experiments were to be carried out in the Caribbean, and dangerous pathogens, such as the anthrax and *Brucella* viruses, were to be tested on sheep, guinea pigs and monkeys.[381] Despite the MoS and Porton scientists being sworn to secrecy, the British press soon became aware of this top-secret operation, and speculation about the secret experiments permeated the newspapers. Incidentally, the press did not suspect the testing of biological weapons at all, but rather, the focus, and concern was of atomic weapon testing. Even though the British press may have been wrong about the prospect of nuclear trials, they still developed dramatic narratives about animal testing.[382] The weekly illustrated newspaper the *Daily Graphic* ran an article about 'Operation X, the Royal Navy's first big exercise to discover the effect of atomic weapons'.[383] Other newspapers were also misconceived in their notion that the Royal Navy was testing atomic weaponry; 'Two warships are being fitted out as floating laboratories for Britain's first atomic weapon experiments'[384] exclaimed the *Daily Express,* 'The tests are to be held before the end of this year'.[385]

Despite the journalists' conjecture about atomic weaponry, they were accurate about one thing – the use of animals for scientific experimentation on board the Royal Navy

379 Ibid.
380 Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*. p.40.
381 The National Archives [TNA]: Department of the Ministry of Defence (DEFE5/15): DEFE5/15/267, B.W. Trials at Sea- Operation Harness: Report by the Biological Warfare Sub-Committee, 18 August, 1949.

383 TNA: Home Office Registered Papers (HO45): HO45/25867: 'Two Navy Ships Will Test Atom Ray Effect: Rabbits on Board', The Daily Graphic, 14 October 1948. [n.p.].
384 TNA, HO45/25867:W. A Crumley, *Navy fits out atom-ray ships,* Daily Express, Monday, September 27, 1948, p. 1.
385 Ibid. p. 1.

vessels. As reported by *The Daily Graphic*; '[P]ens have been fitted for rabbits, pigs and goats to be used for tests of the extent of radiation danger after atomic explosions'.[386] Consequently, as a result of the press coverage about the forthcoming animal experiments, the National Antivivisection Society, The British Anti-Vivisection Society and The National Canine Defence League wrote to senior government officials in the hope of preventing these tests being carried out. The British Antivivisection Society sent a letter addressed to the First Lord of the Admiralty that made reference to the press coverage of the impending trials and the "animal complement"[387] that would be used during the course of them. The letter condemned the use of animals in atomic experiments and compared the forthcoming experiments to those conducted by the U.S. during the Bikini Atoll trials on the Marshall Islands in 1946 and expressed the hope that '[Y]our department will seek, by every possible means to find a method by which the use of animals can be dispensed with.[388] Mr Tyldesley, the head of the British Antivivisection Society, concluded the letter to the Secretary of State (SoS) by referring to the experiments as a precursor to 'this new kind of warfare' in which he and his society hoped for some assurance that the 'animals used… will not be used in such a way as to involve suffering'[389]. Following this, another letter was soon sent to the Secretary of State from R. Fielding-Ould of the National Antivivisection Society about the reports in the press of the proposed sea trials. Fielding-Ould made several points about the law and vivisection, requested a response from the SoS asking if the experiments were bound by law under the Cruelty to Animals Act 1876 and asked that, if the trials were to go ahead, to ensure that the experimenters would uphold the "pain condition".[390] The 'pain condition' formed a crucial part of the 1876 Act and guaranteed that animals that were used in experiments would not suffer unnecessary pain. The Act[391] was a vital piece of legal regulation that would guarantee that the experiments could be carried out lawfully despite protests by the public.

As a result of the press coverage and the public becoming increasingly aware of the forthcoming trials, the issue of law and the military's commitment to the Act was raised

386 TNA, HO 45/25867, Alan Gardner, *Two Navy Ships Will Test Atom Ray Effect: Rabbits on Board*', The Daily Graphic, 14 October 1948. [n.p]
387 TNA, HO 45/25867, V. Tyldesley to First Lord of the Admiralty, 30 September 1948 [n.p.]
388 Ibid.
389 Ibid.
390 TNA, HO 45/25867, R. Fielding-Ould to Sectretary of State for the Home Office, 12 October 1948.
391 See introduction for explanation of Cruelty to Animals Act, 1876.

in Parliament, asking Mr Dugdale MP, then the Parliamentary Secretary 'whether he will give an assurance that any animals used for this purpose will have to suffer no cruelty'.[392] The kind of animals to be used and the number involved in the experiments were also questioned several times by separate Members of Parliament.[393] Yet, his reply was somewhat oblique as he argued that it was 'not in the public interest to give details of experimental work which may be carried out to meet defence requirements' and further claiming that all animals taking part in the 'work' will be bound by law under the 1876 Act.[394] However, behind the public display of lawful obedience lay a sea of confusion regarding the Cruelty to Animals Act and the obligations of Porton Down scientists when it came to animal experiments and the law. Did the Crown bind Porton scientists, or could they flout the law when it came research in the military domain?

Power, Knowledge and Crown Immunity

Clearly, the press had been mistaken in their atomic assumptions, but correct in their prediction of animal experimentation. The 'expedition' was indeed Operation Harness, and this was made clear in a letter to L. J. H. Naylor Esq. of the Ministry of Supply, from R.A. McCarthy of the Home Office. McCarthy stressed that Naylor should have been 'well aware of the implications of Operation Harness' because of the 'press statements and the questions raised in the House of Commons about the 'putting out of certain landing craft as laboratories and the use of animals therewith'.[395] The main concern of the Home Office was not the inferences of the press, but rather the concern that they were 'not yet in possession of legal confirmation that the Act [1876] covers any activities outside of the United Kingdom'.[396] Despite this doubt, replies to the anti-vivisection bodies assured them that these experiments were indeed governed by the Cruelty to Animals Act 1876 and 'that the animals shall not be subjugated to unnecessary suffering' as 'all experiments carried out by my Department for Defence research purposes the safeguards of the Cruelty to Animals Act, 1876 are applied'.[397]

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[392] Historic Hansard, Experimental work (animals), HC debate, 10 November 1948, Vo 457 CC 19-1W
[393] Historic Hansard, Experimental work (animals), HC debate, 10 November 1948, Vo 457 CC 19-1W & HC Debate, 24 November 1948, Vol 458, CC115-6W.
[394] Ibid.
[395] TNA, HO 45/25867, R. A. McCarthy to L. G. H. Naylor Esq, 19th November 1948. [n.p].
[396] Ibid.
[397] TNA, HO 45/25867, G. R, Strauss to Anthony Nutting, 6 December 1948.

So, as it was, the Home Office were unclear about the legal position but still persisted in telling the public that this law would govern any experiments conducted by the state. It was behind the scenes that officials corresponded with legal representatives about the forthcoming experiments and their right to test on animals. In a series of memorandums directed to and from the Government's solicitors, an in-depth discussion ensued about the Cruelty to Animals Act and its applicability to these forthcoming B.W. trials. Broadly speaking, the memos discussed the experiments in light of prospective publicity. And it was due to this anticipated public pressure that Government bureaucrats asserted that 'there would now seem to be a case for seeking the opinion of Legal Advisors'.[398] This was so the experiments could be lawfully conducted. The general line taken was that 'the provisions of the Cruelty to Animals Act, 1876, should be applied to the experiments '[399]. Yet, what was actually the case was far more complex and convoluted. The point at issue was discussed in light of the Act applying to ships in both British and foreign waters, as well as 'on the high seas'.[400] Whether or not ships that were the property of "the Crown" or outside of territorial waters, the Act still created an opportunity for the government to carry out biological warfare testing on animals. Not only that, because these experiments were state implemented, ministers began to question whether the 'Crown is bound'.[401] With the general view from lawyers being that the Crown is not bound by the Cruelty to Animals Act, but stating that 'it is however, often inexpedient to claim Crown immunity: in practice immunity has not been claimed in the past case of the Act, and it is administratively agreed – in which I concur – that it would be a mistake to claim it'. [402]

It was asserted that it was not practicable to claim immunity under the aegis of the Monarch. This could have been for a number of reasons. Most obvious though, would be the fear of public retribution if it was to become known that animals were tested on because of a loophole in the law. Hence, it was asserted in the memorandums that, the Home Office 'would be embarrassed to bring to light the fact that the Crown is not bound by this statute',[403] and of course this would trigger public outcry. One way the experiments could go ahead would be through the licencing of individual scientists

398 TNA, HO 45/25867, Memorandum, October, 1948.
399 TNA, HO 45/25867, K. P. W. to Cooper November 1948.
400 TNA Home Office Registered Files [HO 45]: HO 45/25867, Memorandum, (October, 1948.)
401 TNA Home Office Registered Files [HO 45]: HO 45/25867, Memorandum by G. B. T. Barr, (5 November 1948).
402 TNA, HO 45/25867, Memorandum, October, 1948.
403 TNA, HO 45/25867, Memorandum by G. B. T. Barr, 21 July 1950.

conducting the experiments, as they would be bound by the Act.[404] This would help generate a more positive public image about the trials in their responses to the anti-vivisection societies.

Not only that, in anticipation of the resultant press furore concerning the experiments, it seemed expedient for the Ministers of the Home Office to point out to the Porton Down scientists 'that any work carried out… should be performed under the provisions of the Cruelty to Animals Act'.[405] So the responsibility of following the letter of the law was very much placed upon the individual scientists. Not only that, further down the line, it came to light that the Act:

> [E]xtends to British ships, at any rate for some purposes, and Royal Navy ships would appear to be a case *a fortiori* (pace the Crown immunity questions). … Accordingly though the whole subject is somewhat obscure and very lacking in authority, it would appear that the Act, again pace Crown immunity, applies to acts done on board His Majesty's Ships whether on the high sea or in territorial waters.[406]

It became apparent that it was important to emphasise that the Royal Navy was a 'strong case' (case *a fortiori*) for having permission from the Crown (*'pace'* by permission of the Crown) not to be immune from the legalities of the Act. However, the case was complex and demonstrated that the discourse of law in respect of the forthcoming biological weapons trials was obscure and unreliable in this respect. Yet, it was essential for the Home Office to be seen to have their scientists licenced and noteworthy to suggest that the law should be followed despite any suggestion of Crown Immunity.

It is here that we can see that the discourses about the Cruelty to Animals Act, 1876, created a permissive reality about animals and their use in experimentation.[407] What I mean by this is that the law was a legitimising apparatus for the biological warfare trials. It seems that Whitehall did everything it could to make sure these trials went ahead, but at the same time, made sure the politicians and scientists involved, upheld their public image in terms of being seen to be morally committed to the Act.

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[404] TNA, HO 45/25867, K. P. W. to Cooper November 1948.
[405] TNA, HO 45/25867, R. A McCarthy to L. J. H Talyor Esq. 19 November 1948..
[406] TNA, HO 45/25867, Memorandum by G. B. T. Barr, 5 November 1948.
[407] It was not until 1965 that the Act was reviewed, see chapter 6.

Despite the complexities of the law, the law still enabled Operation Harness to go ahead. This was because the knowledge conveyed by law was deemed as "true", and because the Act originated from people who held 'an office of authority to speak'.[408] These people who made the law held positions of power, had the status of someone who can make truth claims about animals and their right to be experimented on. This is even so despite the original 1876 Act being initially brought into being through early nineteenth century social movements such as the Antivivisection groups, lead by people such as Francis Power Cobb (see chapter six).[409] Animals under the statute were deemed objects. The words that emanated from the Act held the mantle of power-knowledge. Thus, the Act contained 'paradoxical truths'[410] that protected animals from "unnecessary suffering" but at the same time conceptualised them as objects.

No Peace for Animals: The Search for a Biological Weapon

For Operation Harness to go ahead as it did, a set of inwardly directed narratives circulated within the chambers of Government in defence of B.W. research and the use of animals in such experiments. These appeasing narratives empowered the scientists and permitted the use of nonhuman animals in experiments under the aegis of law. But what were these experiments? What did they involve? Who did they involve? Beginning in 1948 with Harness and through to 1955, Britain alongside Canada and the U.S. colluded in a series of sea trials aimed at developing biological weapons for offensive measures. Despite the circulation of narratives about the role of the experiments in the creation of suitable *defensive* operations, what becomes clear is that these experiments were part of a strategic plan to build biological weapons of mass destruction in the Cold War era.[411] Nonhuman animals played a huge part in this and became constructed by scientists as living objects to be used in assessing the effect dangerous pathogens had on a living body. These nonhumans were not living *beings,* but living *matter* that could provide "suitable" physiological comparisons when it came to measuring decline of living tissue once affected by biological agents.

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408 Johnson, *Power, Knowledge, Animals*. p.42.
409 Kean, *Animal Rights: Political and Social Change in Britain since 1800*.
410 Johnson, *Power, Knowledge, Animals*. p.42.
411 See, TNA, DEFE 5/15, DEFE 5/47/310, AVIA 54/2251, DEFE 55/261 and DEFE 55/256.

Operation Harness

A biological bomb that could reap wanton destruction became the central goal of the Tripartite nations in a post-Second World War world.[412] It became the rhetoric of B.W. scientists that outdoor trials were of the upmost importance in supplementing 'data obtained in the laboratory' of the testing of B.W. agents and to 'augment the scanty evidence obtained during the war concerning the effectiveness of certain biological warfare agents under field conditions'.[413] Therefore, a suitable testing site was located in the Caribbean, off Antigua between December 1948 and February 1949.[414] 'Operation Harness' became the first of a series of trials to test dangerous pathogens on nonhuman animals in order to assess their effectiveness in creating a biological bomb.

The technique was simple; two landing ship tanks (L.S.T's) were to be fitted out with a series of sampling points 'each consisting of a rubber dinghy carrying an animal and sampling apparatus'.[415] The sampling points were placed on the surface of the water in an arc formation and clouds of biological agents would be released from a bomb or spray device upwind of the nonhumans.[416] The scientists would watch the release of the pathogens from H.M.S. Ben Lomond – designated as the laboratory ship for the exercise. Once the animals became infected, they would be transferred to one of the L.S.T's… removed to storage space… and the dinghy's and gear sterilized'[417]. The animals used in the trials consisted of sheep, guinea-pigs and monkeys, who were systematically exposed to a range of pathogens including anthrax, brucellosis, and tularemia.[418] Once infected with the pathogenic organisms, the animals were transported

412 Balmer 2012: Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*.40.
413 TNA, Department of the Ministry of Defence (DEFE 5/15): DEFE 5/15/267, B.W. trials at Sea-Operation Harness: report by the Biological Warfare Sub-Committee, 18 August, 1949].
414 Ibid. p.2.
415 Ibid. p.1.
416 Ibid. p.1.
417 Ibid. p.1.
418 Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*. P.40

and sent to an onshore 'isolation farm where [the] infected animals could be kept under observation'.[419] The corpses of the infected animals were then cast away into the sea.[420]

In all, twenty-two trials were conducted on nonhuman animals, and not all were successful. Seven of the trials were either a 'complete failure' or only 'partially successful'.[421] Despite the lack of viable evidence produced by the elaborate scheme, and the hundreds of animals used in the trials, scientists from Porton Down did justify their work and claimed that the trials;

> (i) Confirm and augment the wartime findings in respect of two agents, (ii) Show that a third agent can infect animals in the field, (iii) Confirm the toxicity of those three agents is many times greater than that of any chemical agent, (iv) Support previous laboratory work which had shown improvement between ten and twenty fold in the effectiveness of one agent as the result of a modification.[422]

In general, notwithstanding the lack of positive results the Harness team supplemented this lack with the necessity of continuing B.W. trials in the open. Proposals were made for future trials as 'it was the opinion… that field trials are an essential complement to research in the laboratory.[423] During a conference between the tripartite nations, there was… unanimous agreement that the ultimate objective should be full-scale field trials of toxic agents and weapons'. [424] However, it was subsequently thought that only a couple of species of animals were up to the task of being experimental "subjects" and that Harness:

> Has provided information regarding the behaviour of new types of bacterial suspensions which contain experimental animals, and brought out the value of monkeys in this type of research. It will be unnecessary, in future, to rely on such clumsy animals as sheep in trials with bacterial clouds. [425]

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419 TNA, DEFE 5/15/267, B.W. trials at Sea-Operation Harness: report by the Biological Warfare Sub-Committee, 18 August, 1949. p. 2.
420Paxman, *A Higher Form of Killing: The Secret History of Chemical and Biological Warfare*. p. 158
421 TNA, DEFE 5/15/267, B.W. trials at Sea-Operation Harness: report by the Biological Warfare Sub-Committee, 18 August, 1949. p. 3
422 Ibid. p. 3
423 TNA, War Office (WO 195): WO 195/10483, Biological Research Advisory Board: operation Harness Opinions and Recommendations of the Conference of Technical Representatives of the U.S. Canada and the UK, 12 July 1949. p. 1
424 Ibid.
425 TNA, WO 195/10485, Biological Research Advisory Board: technical opinion on operation Harness, 12 July 1949, p. 1

Only certain kinds of nonhuman animal were considered to be appropriate for subsequent operations. With the sheep being labelled as "clumsy", signifying their awkwardness when it came to their use for B.W. trials. Nevertheless, implicit in this account of Harness is the idea that nonhuman animals are essential in the creation of Britain and allied nations' military capabilities. It was towards the end of Harness that plans by Porton Down scientists were being made to follow up these trials with further experiments at sea in the next operation, Operation Cauldron.

Hubble Bubble, Toil and Trouble: From Operation Cauldron to Operation Negation, 1952-1955.

With the conduct and responsibility of sea trials firmly placed in the hands of the British scientists of Porton,[426] the Conservative governments of the 1950s (1951- 1964) gave their approval and financial backing for further B.W. trials. A suitable site for the next two operations was found off the coast of Scotland near the Isle of Lewis. Similar to Operation Harness, these trials involved the testing of pathogens, Brucella suis (which causes 'abortion' in pigs and flu-like symptoms in humans) and Pasteurella Pestis (a variant of the plague virus), for offensive reasons. The technique of the trials differed slightly from Harness as it was thought that the previous operation had 'certain disadvantages; it required a large number of men and a great deal of equipment, and accurate control of trial conditions could not be exercised'.[427] Rather, the aim for Cauldron was to reduce the number of men and amount of equipment used and this was done through a variety of ways. Firstly, the floating pontoon containing the experimental animals remained anchored at sea rather than having to be towed away by dinghy after each trial. These provided such advantages that 'the animals and sampling devices could be brought to the layout and taken away after a trial'.[428] The infected animals were then transferred to the "dirty" hold of H.M.S. Ben Lomond.

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426 TNA, WO 195/9765, Biological Research Advisory Board: operation Harness, Minutes of Meeting of "Harness" Advanced Base Reconnaissance Group, held at the Pentagon, Washington D.C. 29 January 1948, Enclosure A, p.2.

427 TNA, Department of Defence (DEFE 5/47) DEFE 5/47/310, Ministry of Defence Chiefs of Staff Committee, Memorandum – Operation Cauldron, 1952, Summary of Scientific Report by the Biological Warfare Sub-Committee, 7 July 1953, p. 1

428 TNA, WO 195/12213, Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientific Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander.

In Operation Cauldron and in the subsequent trials after Harness,Ben Lomond acted as both the laboratory ship complete with 'clean' hold (for holding uninfected animals) and the 'dirty' hold (for holding infected animals, (see figure two).[429] Secondly, the pontoon for holding the animals during testing measured 200ft by 60ft in an arc of twenty-five yards radius. This had been modified since Operation Harness, so that no tow dinghy was necessary as the 'use of compartments below deck meant that several trials could be done in succession and men and animals could remain there during the trials'.[430] The pontoon was 'little more than a floating box with 24 compartments, 9 of which had to be converted to house diesel generators, pumps, "clean" and "dirty" animal stowage, change rooms etc'.[431]

The third difference between Harness and Cauldron was the number of staff involved; 'our determination to reduce to an absolute minimum the number of men directly involved, meant that each individual was charged with a fairly complex series of jobs that had to interlock with the other men's duties'.[432] The officer in charge of the operation was Commander Cowgill of the Admiralty who accordingly made an 'invaluable contribution as "stage director" with infinite patience and an exact eye for detail',[433], naturally. With the reduction in the number of staff, J.D. Morton made it perfectly clear in the report that these trials were not grounded in welfarist doctrines of rights of the working man, and this meant that 'there was no place for a strict "Trades Union" attitude.' There were seven men on the pontoon during trials; the officer joined the three vets in the ship for stowing of exposed animals – a total of only 12 men in full protective rig.[434] Modern military science clearly did not have time for left-wing labour sentiments when it came to fulfilling British hopes of achieving the construction a powerful weapon of mass destruction.

[429] Ibid. p.4.
[430] Ibid. p. 4
[431] Ibid. p. 5.
[432] Ibid. p. 6
[433] Ibid. p. 6.
[434] Ibid. p. 6

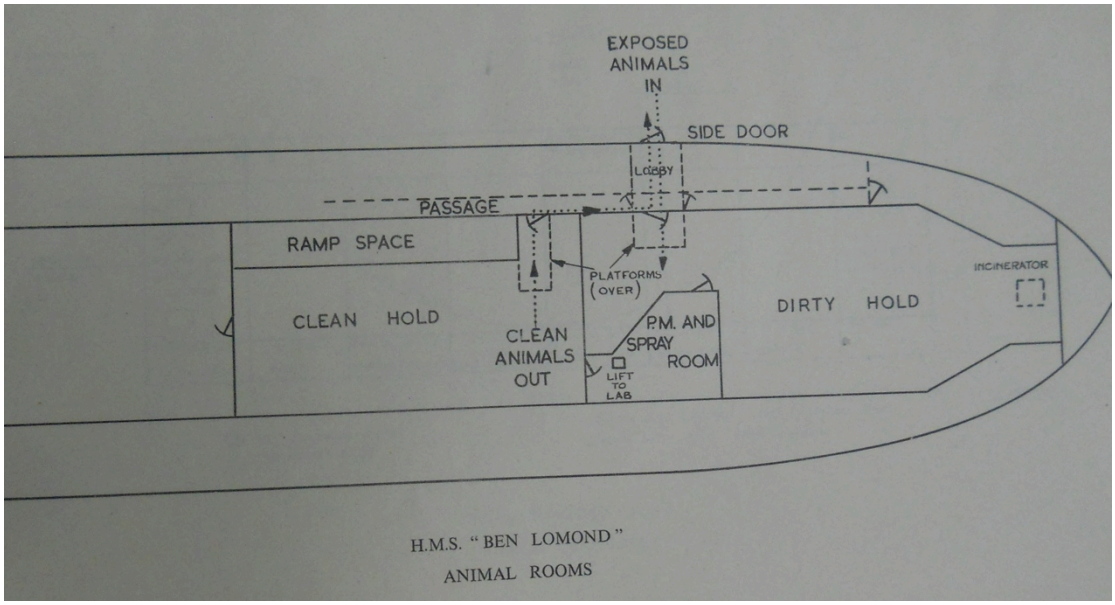

Figure two: TNA War Office [WO 195] WO 195/12213, Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientific Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander.

With the techniques for the trials in place, the scientists, vets from the Royal Air Force Veterinary Core (R.A.V.C.) and Admiralty staff sailed from Chatham docks on the 5th May 1952 and arrived on site on the 8th May to conduct the Cauldron trials. The first trials using the pathogens were not done until six weeks after arrival due to terrible weather conditions. The trials used Br.suis on guinea-pigs and monkeys. They gave the scientists 'reasonable good answers about the efficacy' of the diseases on such nonhuman animals.[435] The experiments of course were in the name of offense and testing of potential weapons to be used against opponents. With Br.suis[436] proving successful because 'data supporting this were provided by sampling devices used in the trials and it is satisfactory to note that of a large number of guinea-pigs exposed, a small bomb filling was capable of infecting nearly every one.'[437] Pasteurella Pestis (or virulent plague) was not as great a success with the experimenters, with the B.W. Sub-Committee remarking that the evidence obtained signified 'that it is not an agent of striking potentialities'. Having said this, the percentage infected with plague was 12% (guinea-pigs) and 38%

[435] Ibid. p. 7.
[436] The bacterium Br.suis affects the reproductive organs of female pigs and causes humans to become incapacitated once inhaled.
[437] TNA, DEFE 5/47/310, Ministry of Defence Chiefs of Staff Committee, Memorandum – Operation Cauldron, 1952, Summary of Scientific Report by the Biological Warfare Sub-Committee, 7 July 1953, [n.p].

(monkeys), with Br.suis, 85% of guinea-pigs were infected and 59% of monkeys.[438] All in all, 36 toxic trials were done using 3,500 guinea-pigs and 84 monkeys, all of whom were exposed to plague and Br.suis.

Operation Hesperus in 1953 continued in the same vein as Cauldron and in the same location. The same techniques, methods, and species of animals were used. However, Hesperus not only tested Br.suis on hundreds of nonhuman animals but also Bacterium tularense.[439] Yet, it was clear that despite the claims coming from the Conservative government about B.W. research for defensive purposes, it is obvious that the Porton scientists in these trials were testing bombs, and the viability of bacterium in certain types of bomb, with the scientific report clearly stating that 'Experiments with these two agents in British and American experimental bombs showed very clearly the superiority of one agent in one weapon, and the other in the other' by outlining how biological agent and weapon cannot be treated as separate entities.[440]

Rather contrarily to the results of the Cauldron and Hesperus trials, the Porton scientists claimed that they had gathered 'convincing evidence with Br.suis and Bact.tularense,'[441] advancing the argument that it was therefore necessary to continue B.W. research in this area. At the request of the British Prime Minister, Winston Churchill, Operation Ozone was carried out during February-May 1954 followed by Operation Negation in 1955, in the waters of the Bahamas.[442]

Operation Ozone and Operation Negation: 1954-1955

Operation Ozone, followed in 1954-5 by Operation Negation, also provided the opportunity to test an even more dangerous pathogen, Venezuelan Equine Encephalomyelitis (a progressive disease in horses that effects the central nervous system. In humans, flu-like systems appear which can eventually lead to death).[443] In

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438 Ibid.

439 Bacterium tularense is a variant of the plague virus and tests showed that it was slightly more susceptible in terms of rates of infectivity.

440 TNA, Department of Defence (DEFE 55) DEFE 55/256, Operation Ozone 1954 Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander, p. (i).

441 Ibid. p. (i).

442 Ibid. p. (i).

443 Ibid. p. (i).

Negation, an additional pathogen was added, Vaccinia Virus (a variant of small pox).[444] Another addition to the programmes that differed from the previous operations was the fact that it was deemed necessary to assess the behaviour of pathogens in 'natural conditions' using aerosol sprays, and how ultraviolet light effected the decay of bacterial and viral agents.[445] Alongside this, the team hoped to; '[S]tudy the influence of various methods of dispersal (high explosive and propellant explosive, compared with spray) on one or two well-known pathogens.'[446] Operation Ozone conducted trials in the daylight, whereas Negation took the opportunity to test infectious diseases at nightfall.[447] The animals used in these two studies were primarily guinea-pigs and mice, with fertilised chicken eggs being added to the mixture in Operation Negation. Incidentally, the fertilised eggs were not considered to be 'alive' as such.[448] To transport the animals from Allington Farm – Porton Down's own animal farm used for the purpose of breeding large quantities of experimental animals – a link by air was necessitated for Ozone, with transport by sea for Negation.[449]

The transport of the nonhuman animals to the British colony proved difficult and contentious at times. The intention of the British and Commonwealth Governments was to keep the trials as secret as possible and away from the public gaze. Therefore, once the animals had arrived in the Bahamas in the town of Nassau, every effort was made so that the 'animals were specially handled to conceal their presence'.[450] This was indicative of the broader concerns about secrecy which surrounded all of these trials at the time: the use of live dangerous infective agents were to be kept hidden from the public. Concerns regarding press intrusion about the use of animals in these experiments were lso evident.

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444 TNA, DEFE 55/261, Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander, P. i.
445 TNA, DEFE 55/256, Operation Ozone 1954: small scale experiments with biological weapons agents over water, Discussion of Results, p. 11..
446 Ibid. p.11.
447 TNA, DEFE 55/261, Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander, p. 3-4.
448 See: TNA, DEFE 55/256, Operation Ozone1954: Small scale experiments with biological weapons agents over water, Discussion of Results. And: DEFE 55/261, Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander.
449 Ibid.
450 See: TNA, DEFE 55/256, Operation Ozone 1954: Small-scale experiments with biological weapons agents over water, Discussion of Results. And: DEFE 55/261, Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander

As noted by the Ministry of Supply in a letter addressed to the Prime Minster about undesirable publicity because of:

> …The fact that we are experimenting with animals, a subject which the British public in general, and the Anti-vivisection Society in particular, are especially sensitive. The fitting out of Ben Lomond with animal cages is known to a wide circle of Dockyard Workmen at Chatham, naval ratings and some subcontractors. Replacements of animals arrive by air […] and this cannot help being known to a number of civilians.[…] The danger of leakage is clear, but in view of the decisions last year the question of publicity has not been raised again at Ministerial level for this year's trial, and the position remains that there is a dormant statement in existence for the Chiefs of Staff to being up to the Minister of Defence if circumstances require[451]

To compensate for this, the Ministry of Supply drafted a press statement to release to journalists if certain events were suspected and eventually became public.[452] Even though the draft press release was written for Operation Cauldron and Hesperus, it was never released to the newspapers, but was kept until the government thought it may be needed, in 1954, at the time of the Bahaman trials[453]:

> In order that effective means of defence may be developed every possibility must be studied, not only in the laboratory but in the field. To this end, for example, highly specialised laboratory apparatus has been developed for the study of the mode of infection of many forms of respiratory disease. Furthermore, the results so obtained are to be tested this year by experiments in the open; for safety reasons this experiments will be carried out at sea. Only by such means can the risk from biological warfare attack be adequately assessed and specific defence measures perfected.[454]

This very bland statement from the Ministry of Supply, clearly aims to misguide the public in matters of the types of bacterium and viruses used in the experiments *and* that the nature of the trials were in fact for offensive reasons, not defensive measures. Not only that, by locating the trials within the broader social context of the Cold War and the heightened state of paranoia within Britain, the Ministry of Supply could hope to

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451 TNA Ministry of Aviation [AVIA 54] AVIA 54/2251, Policy: Operation Hesperus, Draft Statement to the Press on the General Purposes of Experiments at Sea During 1952, 27 May, 1953. p. 2.
452 TNA, AVIA 54/2251, Policy: Operation Hesperus, Draft Statement to the Press on the General Purposes of Experiments at Sea During 1952, 27 May, 1953.
453 Robert Harris and Jeremy Paxman, A Higher Form of Killing: The Secret History of Chemical and Biological Warfare, 2002, London: Red Arrow Books, p. 160.
454 TNA, AVIA 54/2251, Policy: Operation Hesperus, Draft Statement to the Press on the General Purposes of Experiments at Sea During 1952, 27 May 1953.

persuade the public of the necessity of the trials and the use of animals therein. In the Bahamas, news of the press release reached J. D. Morton who wrote:

> Our reaction [to the press release] was satisfaction at the easing of our problems at Nassau, tempered only by anxiety about the local feeling. There proved to be no very serious interest in our activities, though the Tourist Board declared, without evidence, that we would be bad for trade: mostly, there was welcome relief from 'you're from the Mystery ship, aren't you?' followed by curiosity as to our business, to a cheerful 'how are the germs today?' and a change of subject to something more interesting.[455]

Clearly, the press release had worked and the general public were unperturbed by the experiments. The nonhuman animals involved in the experiments were clearly and most 'officially' downplayed - not even mentioned. This allowed for the continuation of the use of hundreds of guinea-pigs and mice in Ozone and Negation.

With the public led astray about the nature and content of the experiments the trials of infective agents could continue as normal. For the scientists working on Ozone, the results were satisfactory. A total of eighty-four experiments were conducted for Operation Ozone; twenty-seven with Brucella suis, thirty-two with Bacterium tularense and eighteen with Venezuelan Equine Encephalomyelitis. The rest were "unaccounted" for.[456] Operation Ozone demonstrated that ultraviolet light could rapidly decay the pathogenic organism and decrease the infection rate caused by the diseases when released through an aerosol spray, so; 'their offensive use in such conditions would lose a great deal of its potential effect'.[457] Hence, Operation Negation aimed at testing the pathogenic agents in both sunlight and twilight in order to compare infection rates and decay of the organisms.[458]

Despite the use of even more guinea-pigs for trials in Negation, the results were seen as lacking validity and were particularly 'ill-fated' when it came to the testing of Venezuelan Equine Encephalomyelitis.[459] Yet, 880 guinea-pigs were used in the experiments and 380 in laboratory tests. Mice were also bred and used on site, and rabbits were considered too

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[455] TNA, DEFE 55/256, Operation Ozone 1954: small scale experiments with biological weapons agents over water, 22 December 1954, p. 7.
[456] Ibid. p. 12.
[457] Ibid. p. 19.
[458] TNA, DEFE 55/261, Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander, p.3.
[459] Ibid. p. 13.

but were not used because a batch of fertilised eggs could not be sourced on the town of Nassau:

> We took 24 rabbits so that at least a rough assessment of the vaccinia might be made by injection in the depilated skin: one rabbit would carry a day's assessment, so with a precautionary duplication each time we had enough for 12 days – more than we expected to do. One of the rabbits was injured on arrival in "Ben Lomond" and was destroyed.… There was no need for the remainder to be used. They were kept however, mainly because they had acquired names, developed personalities, and became the cherished pets of the RAVC party. After six months of this idle luxury they were as large, sleek and contented as any rabbit could wish to be.[460]

As the rabbits were not needed for experimental purposes, they seemingly became doted-upon pets of the very staff who were using the nonhuman animals for testing. The incongruous and ambivalent nature of the treatment of nonhumans in these series of experiments acts as an analytical point of departure in this chapter. Animals were at once used as objects of study, but also treated with care and concern over their welfare. It is here where I will discuss the power-knowledge relationship embedded within these scientific discourses about the animals used in the Operations. Nonhumans were considered to be parts, not wholes, and kept healthy and well-fed, in order to infect them with virulent diseases so that the scientists could assess their decline in health and resultant physiological deterioration. A discourse of lines is proposed, in order to understand the connection between scientific statements of 'truth' about biological weapons and the treatment of nonhuman animals in the trials.

Power in the Making: Animal Experiments and the Production of Knowledge

Within these series of trials lays a succession of discourses that hid behind a veil of purported scientific 'truth'. Michel Foucault asserts that the gaze of the scientific observer produces a knowledge which is based on the perceptual (what can be seen).[461] The focus on what can be observed excludes the other senses of touch, taste and smell; sight becomes the 'sense by which we perceive, extend and establish proof'.[462] The gaze beholding the infected nonhuman body enabled the scientists to categorise and generalise their experiments in terms of the effect dangerous pathogens had on parts of

[460] Ibid. p 26.
[461] Foucault, *The Order of Things*. p. 144.
[462] Ibid. p. 144.

the nonhuman body. They did this through vivisection and the dissection of the animal into parts, or what Johnson, calls the 'discourse of lines'.[463]

Contained within the scientific reports, are precise details about the method employed to assess, analyse and recognise the uncontaminated nonhuman from the contaminated. Turning to Foucault,[464] the nonhuman animals used in the trials can be constituted by four historically contingent categories: the form of the elements, the quantity of those elements, the manner in which they are distributed in space in relation to each other, and the relative magnitude of each element.[465] For example, the scientific reports describe in detail the effect of B.W. on animals, post-mortems were conducted, in order to enumerate the effect pathogens had on the different parts of an animal i.e. their liver, spleen, reproductive system etc.[466] Alongside this was the ability to identify and define the effect and where the effect is distributed in the body.

The Infected: The Post-Mortem as an Exercise of Power Over the Nonhuman

In order to determine the effect of dangerous pathogens on the body of the nonhuman, a rigorous post-mortem methodology was utilised, which was outlined in the report on Operation Cauldron. This technique was used throughout the series of trials, ending with Operation Negation. As will be shown, the nature and style of the conduct of the post-mortems became a site where the investigative and explanatory power of the human is exercised over the nonhuman. Furthermore, examining the manner in which vivisection was performed demonstrates how the interests of the scientists are interrelated with the concerns of the wider 'politico-technological' system in Britain at the time,[467] or what I would term the birth of the military-animal-industrial complex. In other words, the investigative approaches to post-mortems were grounded in the socio-political apparatus rather than the biological. This was undergirded by a discourse of pathology[468] within which the animal body became a Cartesian material entity devoid of life; because the

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463 Ibid. p. 145. Johnson, *Power, Knowledge, Animals*.
464Foucault, *The Order of Things*.. p. 146
465 Ibid. p. 146
466 TNA War Office [WO 195] WO 195/12213, Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientific Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander,
467 Lindsay Prior, "Policing the Dead: A Sociology of the Mortuary," *Sociology,* 21, no. 3 (1987).P. 355.
468 Ibid. p. 355

nonhuman 'cadaver [became] an object, a repository of disease and infection. It [was] a container, a shell; at once a solution to a riddle, and an obstacle to knowledge':[469]

> The object of post mortem examination of trials animals… is to determine whether the animal is "infected" with the specific organism … We have selected arbitrary conditions of examination which maybe expected to demonstrate invasion and substantial multiplication in the host. [470]

Hence, the visualisation of disease was imperative to determine infection. This was evident in the criteria chosen to determine abnormality; in terms of what was characteristic of infection with a specific disease and what was 'abnormal but not characteristic'. [471] The visual coalesced with the theoretical aspect of pathology. Consequently, the animals became objects of knowledge, and through the observational power of the scientists' gaze during post-mortems, the true nature of the efficacy of biological weapons could be determined:

> After exposure to a toxic agent all animals from trials and spray runs were held in the dirty hold for a period of observation. When the results of the laboratory assessment had been calculated, some of the animals which had obviously been outside the cloud [of released toxic agent] were killed off without post-mortem examination. The principle was to retain for further observations all animals at points whose…samples showed an even trace of agent and the animals from four further points, two right and two left of the cloud. The holding periods were 28 days for the animals exposed to US [Brucella suis] and 14 days for animals exposed to L [tularaemia]. Animals dying during the holding period were post-mortemed by the casual PM team.[472]

Clearly the animals were made to live after attempted infection by a toxic bacterial agent. This was so deterioration of the physiology of the monkeys and guinea-pigs could be observed, and the intensity of the effect of the pathogen could be measured after the holding period. The autopsies were divided into two different kinds: 'casual autopsies' for animals that died during the holding period, and 'mass autopsies',[473] where a team of six laboratory staff scientists and two veterinary staff engaged in the slicing and dicing of the body parts of guinea-pigs, monkeys and mice. All monkeys were post-mortemed, and

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469 Ibid. p. 360.
470 TNA, WO 195/12213, Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientfitic Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander. p. 19..
471 Ibid. p.20.
472 Ibid. p.37.
473 Ibid. p.37.

most guinea-pigs, if they had survived the holding period.[474] In preparation for 'mass post-mortems', there was, of course, a series of steps to follow to prepare the nonhuman animals:

> Two RAVC staff and one lab man enter the dirty hold and commence killing about one hour before the arrival of the post-mortem party. (Time adjusted according to number to be killed). Groups of 100-250 have been dealt with. The killed animals are placed in trays: each tray contains the group of animals from the cages which were exposed to the B. W. agent at a particular point of the layout [pontoon], or in a particular laboratory spray experiment. A label indicating Trial Number and exposure point is attached to each tray of dead animals.[475]

The bodies were quantified, but not only that, storage spaces were also to be referenced quantitatively, as well as an accurate time recorded for the euthanasia to happen prior to the post-mortem. The animals coalesced with the storage to become a "thing" or object of the scientific enquiry:

> Monkeys are dealt with in a similar manner. A member of the laboratory staff kills the monkeys by an intraperitoneal injection [injection into the body cavity] of 10-20ml of 6.5 per cent Nembutal solution [a barbiturate drug which slows down the activity of the brain and nervous system]. They are injected 2-3 hours prior to the actual time scheduled for the commencement of post-mortems. For killing, a two vet party remove the animal from the cage (a four vet party if any large numbers of monkeys are required to be examined for a post-mortem); the animal is held extended so that the abdomen is fairly taut. After the injections the animal is returned to the cage and left until dead. The animals are inspected within 3-40 minutes after the Nembutal injection.[476]

The normativity of killing the nonhuman, by which these procedures are embedded in the daily practice of these series of Operations, enabled a language of "distance" and a sense of ambivalence towards nonhuman animals in the B.W. trials.[477] The monkeys, guinea-pigs and mice became part of a 'generalised Other' – at once different from humans, but all of the same 'kind' when it came to the scientific observations and descriptions. The nonhumans were devoid of agency and individuality and were frequently referred to as an 'it', or generally speaking 'the animals'. By deploying this discourse, the scientists held the mantle of neutrality and objectivity - they immediately

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474 Ibid. p.37.
475 Ibid. p78.
476 Ibid. p78.
477 Lynda Birke, "Structuring Relationships: On Science, Feminism and Non-Human Animals," *Feminism and Psychology* 20, no. 3 (2010). p. 341.

became distanced observers, unattached and value-free: 'the object [became] objectified'[478] through the acts of killing, observation and reporting. The animals became numbers or 'tools of the trade' even. [479]

Once the killing was over, the autopsies used a 'mass production' style approach to enquiry.[480] The animals were labelled and passed from the 'dirty hold' in Ben Lomond to the post-mortem room. The rigour of the post-mortem methodology was the ultimate of capitalist production line techniques, one that mimicked the 'factory floor' approach: that of Taylorism. The bodies of the nonhumans were passed from one scientist to the next, round a rotating table, in what was described by Morten as the 'travelling Circus':[481]

> The team prepare the post mortem table, a round revolving stainless steel table. Clips and chains are attached, beakers containing acetone or Lysol are placed in appropriate positions and instruments prepared… The two fixers (vet staff) who lay out the animal on the numbered towel on the tray in front of them and clip the animal out by its four limbs. Each animal thoroughly wetted with Lysol before the table is revolved to bring it in front of the *skinner* who opens the animal up from pubes to jaw, laying the skin back on each side. The animal is now moved round to the *Exposer* who removes the anterior portion of the thoracic cage, laying bare the heart and lungs, and opens up the abdominal cavity exposing the spleen for the *spleen plater* who removes a small portion of the spleen and smears its cut surface on the half of a plate labelled "S", handed to him by the *plate handler* who after marking the plate with the animal's number holds it for the *pathologist* who removes a portion of the lymphatic gland and smears it over the unmarked half of the plate. The pathologist reports to the recorder on the condition of the spleen, liver, cervical and bronchial glands in this order. A typically positive is plus, a typical negative –, E indicates enlarged, and A abnormal[482]

Sounding rather like something out of a horror story, the dead animal is at first clipped to the table in 'chains', with an identification number on the paper underneath them. The body is then rotated round and passed to the first man who peels back the skin of the animal. The second man exposes the organs and the third takes a sample of one particular organ depending on the disease they were looking for[483]. All the scientists

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478 Prior, "Policing the Dead: A Sociology of the Mortuary." p. 360.
479 Birke, "Structuring Relationships: On Science, Feminism and Non-Human Animals." p. 341.
480 http://www.youtube.com/watch?v=CPA_yce0Swg [accessed 12/05/14)
481 Ibid.
482 TNA, WO 195/12213, Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientific Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander, p. 38.
483 Ibid. p38.

present are given names to assume their role, characters in a tragicomedy; they know their place and part, whether you become the "*skinner*" or the "*exposer*", one assumes their role with utmost scientific authority and neutrality. Once the dissection is complete, the bodies of the nonhuman animals are then removed from the table, put into a dustbin, taken to an incinerator and burned.[484]

The autopsies not only vivisected the physical body of the nonhuman; they also acted as a process of scientific ideology. In this methodology of death is the discourse of pathology. Here, there are two aspects of dissection: the physical, as described above, and the ideological – that which is *a priori* to the evidence – the theoretical aspect.[485] Both facets rely on the gaze of the scientists and the ability to 'know' about nonhuman bodies. This is done through superimposing 'lines' upon the body, [486] to enable disassembly of *whole* living beings, and then to be categorised as 'abnormal' by a pathologist. The discourse of lines when taken in the context of the series of Operations lead by the Porton scientists, gave the experiments the mantle of 'truth-telling power'[487] as it came from an 'office of authority to speak'[488] that of military science and the state:

> US [Brucella Suis] guinea-pigs were held at least 21 days: any dying during the holding period were examined, but results were accepted only from the 18th day onwards. Examination was normally confined to gross pathology of spleen and liver, and culture of spleen by smearing a cut surface over fortified tryptose agar containing methyl violet. The criterion normally adopted was positive or negative culture, except for one period when a batch of plates gave negative results from the animals indisputably positive. Having confirmed that the cultures were misleading, […] we had to interpret these trials another way: animals giving a visually positive spleen were taken as positive; animals giving liver only, or neither liver nor spleen, were taken as negative[489]

Here, the guinea-pigs were divided into parts according to their organs, and how their organs *looked* according to the scientist's gaze upon the animal. The *whole* being of the guinea-pigs became obsolete; the organs became the important objects for discovery in the process. The pathologist's gaze was integral to assure the validity of the results for the trials conducted in the Operations: one must *see* in order to understand and produce

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484 Ibid and WO 195/12213 p. 38.
485 Prior, "Policing the Dead: A Sociology of the Mortuary." p. 362
486Johnson, *Power, Knowledge, Animals*. p. 56.
487 Ibid. p.56.
488 Ibid. p.57
489 TNA, DEFE 55/256, Operation Ozone 1954: small-scale experiments with biological weapons agents over water, Discussion of Results. p. 27.

"knowledge". The results were negligible, but with the observation of specific parts of the animals, the scientists could acknowledge the nonhuman as being abnormal and contaminated with viruses. This developed into a methodology that was historically contingent upon the laws of science, as 'each visibly distinct part of… an animal is thus describable'.[490] In fact, the very act of seeing is built into the definition of autopsy: to examine, to *see*.[491]

The Power of Language: Animals, Gender and Biological Warfare Research

With the advent of the Cold War, the role of B.W. research and the purported practice of B.W. during the Korean War (1950-1953) meant that the British and U.S. biological warfare programmes had to be kept top secret.[492] Any publicity about the experiments using 'live germs' would have been disastrous for the Conservative government and would have provoked even more paranoia about the prospect of a 'hot' war in Europe.[493] Nevertheless, the Korean War strengthened the relationship between military science and the state in the U.S., which were conspiring partners in Britain's biological weapons research programme.[494] It was not only the U.S. that was secretly endowing the military with increasing funds for their R & D programmes, but Britain too. Britain's defence expenditure increased significantly from 5.9% of the gross national income in 1950 to 9.3% in 1952. In comparison, spending on social services (welfare such as health and education) in this period decreased from 6% in 1950, to 5.6% in 1952.[495] From this time onwards, up until the late 1950s, Britain invested quite substantially in the area of biological warfare research[496]. Nonhuman animals became the essential component of this science of destruction, and in the conversion of the nonhuman from that of the 'naturalistic animal' (the nonhuman as seen as part of nature), to that of the 'analytic animal'[497] - an animal which becomes objectified in the name of science, and constructed as a part rather than a 'whole' living being.

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490 Johnson, *Power, Knowledge, Animals*. p. 57.Foucault, *The Order of Things*. P.146.
491 Prior, "Policing the Dead: A Sociology of the Mortuary." P. 362.
492 Balmer, *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare*.p. 41.
493 Ibid. p. 41.
494 Agar, *Science in the Twentieth Century and Beyond*.p. 328.
495 Edgerton, *Warfare State: Britain, 1920-1970*.p.68.
496 Ibid.
497 Lynch, "Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences.."

The gaze of the scientist over the nonhuman body in these trials was essential to ascertain the efficacy the pathogens had under experimental conditions and the effect these diseases had on the body. Furthermore, it was the very *method* itself that determined the outcomes of these experiments. This experimental approach was rooted in a philosophy that presented a particular way of understanding and seeing the world. It was grounded in an epistemology that dates back to seventeenth century scientists, Rene Descartes and Francis Bacon.[498] The "way to knowledge" is labelled, in this sense, as "objective", the observers (scientists) are distinct from the known (the body of the nonhuman that has to be dissected in order to produce facts). This scientific approach is historically dependent upon binary categories that separate nature from culture, animal from human, and male from female (see table one).[499] These binary categories leave traces of gender labels that produce a powerful hierarchal structure linked to the social relations occurring in Britain at the time, as well as the contemporary understandings of human-animal relationships.

Dominant	**Oppositional**
Male	Female
Subject	Object
(hu)man	Animal
Culture	Nature
Science (Objectivity)	Emotion (Subjectivity)

Table one: Binary Oppositions.[500]

Scientific research (in general) has been said to be identified as 'masculine', with emotional and embodied ways of knowing about the world, labelled 'subjective' and 'feminine', and 'because the Western world-view values objectivity over subjectivity and men's knowledge over women's, 'feminine' ways to know are by their nature [seen as] inferior'.[501] Therefore, in historical terms, the biological warfare trials conducted by Porton Down scientists could arguably been seen as firmly entrenched within the domain of the masculine, because of their adherence to the strict rules governing scientific methodological techniques.

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[498]Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution*.. p. xi.
[499] Fox-Keller, *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science*.p. 18.
[500]Birke, *Feminism, Animals and Science: The Naming of the Shrew*.. pp.103-115.
[501] Hubbard, *The Poltics of Women's Biology*.p. 8.

Consequently, the series of B.W. trials were at once a product of culture and politics as they were a product of the very domain of knowledge that underpinned the research. Incidentally, none of the Operations explicitly raised any issues of gender. However, the omnipresent influence of gender played out in these experiments on a number of levels. Firstly, in terms of the socio-political relations of the trials: the world of B.W. research at the time was an entirely male world, no female staff were present. This reflected contemporary gender relations occurring in broader society, for instance, the desire to get women to return to the role of being a housewife and mother following the mobilisation of British women during the Second World War, and the contemporary biological reductionist arguments regarding the limitations which women's biology imposed upon their ability to be in education and work.[502]

Secondly, the language and format of the reports employed the scientific philosophy of 'positivism', an ontological standpoint which stipulates that reality is 'out there' to be observed, captured and understood. This, *a priori,* is what directed the gaze of the observer and determined the totality of experience within biological weapons research; i.e. what counted as 'valid' knowledge and which facilitated the formation of a discourse of 'things' that could be recognised as true.[503] This was in part evident in the analysis of the results: the nonhuman animals were transformed into quantitative data. Guinea-pigs were noted for their 'important contribution to the quantitative value of the work'.[504] It was also observed that in the past they had been wasted due to their health, which incidentally made 'calculations of infectivity practically valueless', [505] whereas 'on Cauldron, nearly all the animals exposed contributed to the final answers'.[506] The animals who were less susceptible to infectivity were constructed in terms of their ability to generate mathematical data. For instance, once again on Cauldron:

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[502] Elizabeth Wilson, *Only Halfway to Paradise Women in Postwar Britain: 1945-1968* (London: Tavistock Publications Ltd, 1980).P. 58. Birke, *Feminism, Animals and Science: The Naming of the Shrew*.p.104.
[503] Foucault, *The Order of Things*.p. 172.
[504] TNA, WO 195/12213: Chiefs of Staff Committee: Biological Warfare Sub-Committee, Ministry of Supply, B.R.A.B., Operation Cauldron 1952, Scientific Report by the Microbiological Research Department, Porton and Naval Report by the Naval Commander, p. 7.
[505] Ibid. p.7.
[506] Ibid. p.7.

> Two groups of three trials each with undiluted suspensions of Br.suis in the B/E.1 bomb were done with monkeys and guinea-pigs. The monkey was believed to be less susceptible (*though there were no good quantitative data*) [my emphasis]. So a layout of monkeys flanked by a few guinea-pig points were employed. The intention was to expose monkeys to the heavier dosages and guinea-pigs to the fringes of the clouds (to check against earlier guinea-pig results), this worked very well.[507]

In order to test biological bombs, monkeys had to be given higher dosages, as previous statistics were seen as invalid. Guinea-pigs were used alongside the monkeys in order to compare earlier work. The monkeys and guinea-pigs in Cauldron were transformed into statistical assemblages: mere numbers in the name of war, and this formed an important part of B.W. research. In Hesperus, Ozone and Negation, once again the animals are collapsed into single entities of numbers. For example, in Negation:

> Guinea-pigs were exposed in a number of trials in an attempt to determine any loss of virulence, i.e. whether the number of viable cells required for a given degree of infection was greater after downwind travel. … For infectivity calculations it is of course essential to get results in the range of partial infection: that is, between one to four animals in a group five. Points with 0-5 infected are of practically no use. … It will be seen that the UL (Bacterium Tularense] trials were particularly ill-fated, for only one point gave a dosage that was in the measurable range (and that too high_, and only 3 points gave other than none or all guinea-pigs infected. We must rely on results from previous trials to support the belief that virulence is not lost in downwind travel.[508]

Calculations of infectivity rates seemed to be disappointing, but all were collated in numerical format. Hence, the language of mathematics in this case was important to convey the objectivity of the experiments in terms of the viability of biological agents. This was essential to be able to order the world in such a way so as to produce results that displayed a 'most gratifying linearity'.[509] In all the reports of the operations, these results were also coupled with graphs, charts and tables. The nonhuman animal in these statistics disappeared, became "data" so as to absolve the experimenters from the ethical dilemmas of using animals in the experiments. This too emphasises the experimenters' distance and scientific 'objectivity'.[510] Additionally, the use of mathematical analyses in these trials seemingly generated an ideology of value-freedom where the experimental

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[507] Ibid. p. 7.
[508] TNA, DEFE 55/261: Operation Negation 1954-1955, Scientific Report by the Microbiological Research Department and Naval Report by the Naval Commander. p. 14
[509] Ibid. p. 14.
[510]Joan Dunayer, *Animal Equality: Language and Liberation* (Maryland,: Ryce Publishing, 2001). pp. 111-112.

results were apparently free from social influence and grounded in rationality. However, these assumptions about the objectivity of statistics and the use of them in this research are based in the very binary oppositions mentioned in table one. The results display a hidden bias, and an underlying set of assumptions that were grounded in the androcentric. Hence, this in turn corresponds to the 'masculine' but not the 'feminine' way of knowing about the world.[511]

Likewise, the focus on statistical averages reinforces the illusion of objectivity because it obliquely denies the nonhuman individual as being an active agent. Another example of the kind of objectification of the nonhuman that denies their agency, and is considered a part of scientific objectivity, is through the language employed to describe the animals in all of the reports. The language of objectivity denies individual agency of the nonhuman animals, and transforms the animal body into objects: words such as 'batch' and 'consignment', further, if an animal had to be euthanized, they were systematically 'destroyed'. [512] All signify an objectification of them grounded in the language of positivism, that gave the reports a … language of depersonalised authority'.[513]

This depersonalised authority can be used here to draw on parallels with constructions of women at the time. During the 1950s, a proliferation of scientific studies about women and their capabilities in terms of their 'biological nature' were widely circulated in popular culture. In these, women were often seen as objects, and descriptions permeated the public milieu about the science behind women's 'natural' disposition to motherhood, housework and marriage (to the opposite sex of course).[514] Consequently, scientists also had an important role to play in defining what it means to be a woman, and hence, 'feminine'. This was in terms of defining what is 'normal' and 'natural' for women to do, and how this related to their 'innate biological propensities.'[515] It was also around this time that women were taking up part-time work, as well as remaining at home to look after their husband and children. This dual-role also facilitated an increase in women attending higher education institutions. However, government researchers still depended

511 Harding, *The Science Question in Feminism*.P51.
512 These words are used throughout the scientific reports on all five scientific trials – see previous references.
513 Hubbard, *The Poltics of Women's Biology*.. p. 1
514 Wilson, *Only Halfway to Paradise Women in Postwar Britain: 1945-1968*.p. 58. & pp26-29. And see Hubbard, *The Poltics of Women's Biology*.pp.17-18,
515 Hubbard, *The Poltics of Women's Biology*.p. 18.

on moral and eugenicist arguments to assert women's propensity for motherhood despite their desire to work.[516] For instance, the Standing Joint Committee of Working Women's Organisations, which incidentally argued for women to be able to work outside the home, was actually still morally conservative in approach. The group publicly expressed the idea that women attending institutions of education ran the risk of it affecting their biology, as it would lead to a 'weakening of the biological urge and the desire for children'.[517] Accordingly, there was no increase of women being recruited onto science, technology and medicine courses in the late 1940s and 1950s: the notoriously masculinised subject of science was firmly entrenched to the exclusion of women.[518]

Science in post-war Britain remained firmly located within the domain of the masculine and the warfare state wanted to attract male science graduates into the post-war scientific officer classes of government.[519] Britain was becoming a society that developed a strong scientific culture; it became, 'the direct generator of economic, political, and social accumulation and control[520], through the state's appointment of scientific experts in the field of warfare and welfare.[521] No longer was the scientist seen as marginal to the shaping of society – instead they became a workforce trained in the art of objectivity and value-neutrality, for a career in government laboratories.[522] These government laboratories included Porton Down Microbiological Research Department, although funding tapered off for B.W. research from the mid-1950s onwards, and instead went into nuclear investigations; the Porton scientists and their experiments were still essential to the generation of Britain's military-*animal*-industrial complex.

Coda

This chapter ends at 1955, after the completion of the last sea trials conducted in the Caribbean. As will be noted, the other chapters in this history begin in 1947 and end in 1965. I have done this for two reasons; firstly, following Foucault, to denounce the 'universalising' tendency of normative histories. Foucault argues that traditional historical practices have totalising assumptions, whereby particular events are inserted into a

516 Wilson, *Only Halfway to Paradise Women in Postwar Britain: 1945-1968*.p. 26.
517 Ibid. p. 27-28.
518 Edgerton, *Warfare State: Britain, 1920-1970*.pp. 176-177.
519 Ibid. p 179.
520 Harding, *The Science Question in Feminism*.p 16.
521 Edgerton, *Warfare State: Britain, 1920-1970*. p177
522 Harding, *The Science Question in Feminism*.p. 16.

unifying and total explanatory schema. This deprives specific events of the impact of their significance: 'the world as we know is not this ultimately simple configuration where events are reduced to accentuate their essential traits, their final meaning, or their initial and final value. On the contrary it's a profusion of entangled events'.[523]

Rather than falsely celebrate 'great moments' in history, this one highlights specific events, in detail. Secondly, and relatedly, by shifting the history away from the human (male) and centring it around the nonhuman animal changes how we *do* history. Chapter three outlines why the periodization of this thesis has been set as such. This epistemological positioning of the thesis eschews the fixity of historical events, which traditionally focus around the human. The series of sea trials discussed above re-writes contemporary historical methodologies in terms of periodization (again, see chapter three), as it centralises the events that had a huge impact on the nonhuman animal in Britain at this point in time.

[523] Paul Rabinow, ed., *The Foucault Reader: An Introduction to Foucault's Thought* (London: Penguin Books, 1984). p.89.

Chapter Five

'Stress Without Distress': British Medical Research, Animal Stress and Gender, 1946-1965

'The main features of… successful rat colonies', it was observed in the Universities Federation for Animal Welfare (UFAW) handbook for the care and treatment of laboratory animals, 'are scrupulous cleanliness, strict attention to environmental temperature… adequate nutrition, and painstaking care in general management'. Further on, emphasis was laid upon the personnel who maintain and look after the rats, stating clearly that, preferably, these technical assistants should be *female*.[524] In highlighting this I am arguing from the outset that the historical continuity of medicine is inherently cultural, with the values of biomedicine thus being shared with wider society, despite scientists' claims for its objectivity.[525] Furthermore, medical research into preventative treatments for disease uses a variety of nonhuman animals. Animal experiments were and still are, the gold standard as to which to judge the efficacy of biomedical cures. But, what does this actually mean? What are the implicit historical forces associated with this intersection?

Carol J. Adams highlights this intersection of the laboratory animal and women astutely in her book *Neither Man Nor Beast: Feminism and the Defense of Animals.*[526] It is through the male gaze, or as she puts it, 'the arrogant eye', that the intersection of woman and animal becomes an aspect of subject-object relations in the practice of animal experimentation.[527] If we refer back to the opening statement to this chapter, we can discern how, through this discussion on keeping a successful breeding stock of rats for experimental purposes, the rat and the woman become constituted as a scientific representation – the human technical assistant who cares for the animal must be female, the rat an experimental object – this, in Adams's terms confirms 'the cultural role of the human male gaze that looks at women and animals'.[528] Hence, it is through such historical representations that women and animals' status as an object intersects and the two buttress each other within the discourses of science.

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[524] Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p. 110-111.
[525] Longino, *Science as Social Knowledge: Values and Objectivity in Scientifc Inquiry*. P.15
[526] Adams, *Neither Man nor Beast: Feminism and the Defense of Animals*. pp.39-54.
[527] Ibid. p. 41.
[528] Ibid. p.43.

In this chapter, I want to go further than Adams's subject-object status and consider a different representation of the animal and woman pervading the scientific discourse of the time. I shall argue that during this period members of the scientific community modified their views about the nonhuman as a 'passive object' of manipulation, to one of an 'active object'. This indicated an internalisation of discourses of 'care' towards nonhumans under experiment. The argument is explored in three parts, beginning with an analysis of Hans Selye's concept of stress and its permeation into British animal-dependent medical research. Here it is shown how Selye's concept invoked discourses of care and welfare towards the laboratory animal, which altered historical notions of the human-animal, subject-object, binary. This was most clearly demonstrated in *The UFAW Handbook: The Care And Management of Laboratory Animals.*[529]

The second section unpacks the implications of this 'scientific welfarist' approach to laboratory animals, and will show how the idea of the "stressed animal"[530] within the laboratory revolved around ideas about appropriate scientific methodologies. In the 1950s, Selye's idea of stress contributed towards the understanding that laboratory animals' living conditions interacted with their physiology and affected scientists' experimental methods. Hence, this concept provided an example through which an 'ethical' framework of practice could be convened. Although somewhat ineffective at first, this was the founding moment of an ethical framework that is still in place today, called the 3Rs. The 3R's are: reduction, replacement and refinement. This code of conduct was first legislated in the Animals (Scientific Procedures) Act 1986, which was first outlined in a book written by biological and zoological scientists Russell and Burch in 1959 called the *The Principles of Humane Experimental Technique.*[531]

Finally, this idea of stress in the nonhuman animal will be related to broader social and cultural representations of women at the time. Even though scientists were embracing the idea of ethical practice towards their laboratory animals, they were still conceived of as machine-like and reducible to their component parts. This idea of stress - the physiological and hormonal models of science that emphasized this concept - interrelated

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529 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*.
530 This term was coined by Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." See ibid.
531 W.M.S. Russell and R.L. Burch, *The Principles of Humane Experimental Techinque* (London: Methuen & Co LTD, 1959).And see; Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986."

with contemporary cultural ideals of sex, gender and women. Consequently this chapter argues that even though medical science embraced discourses of stress and *affect* in nonhuman animals, through no longer constructing the nonhuman as a passive object of manipulation, medical science still held true to the Cartesian divide of the subject-object, henceforth constructing animals as 'active-objects' in the world. This anthropomorphised agency reflected the broader socio-cultural climate associated with women at the time. The subject-object, animal-human, man-women binary was still very much a part of scientific and British culture. Therefore, I want to extend Carol J. Adam's concept of the 'arrogant eye' and I hope to show how these entanglements of speciesism and sexism were a lot more complex and historically significant than Adams' work suggests.

Previous Literature

Not many scholars have addressed mid-twentieth century British science in quite this manner. In terms of animal histories and experiment, there is a wealth of literature that focuses on the vivisection-antivivisection debates in nineteenth and early-twentieth century science. Further, there is a wide range of literature that features discussions on the laws associated with the regulation of animal experiment in this period. Notable historians include Hilda Kean, Harriet Ritvo, Nicolaas Rupke, James Turner, Keith Tester, Susan Hamilton, Richard French and Joanna Bourke,[532] all of who focus on the contemporary political debates of the period between pro-and-antivivisectionists.

However, the most prominent historian of mid-twentieth century British science who has looked at animal experimentation and scientific research in the period *circa* 1948-1965 is Robert Kirk. Kirk discusses the standardisation of laboratory animals, the influence of ethology on the practices of laboratory scientists and the emergence of a welfarist perspective towards laboratory animals in this period.[533] As he observes, there is a wide

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[532] Bourke, *What It Means to Be Human: Reflections from 1791 to Present*.p. 469. Susan Hamilton, ed., *Animal Welfare and Anti-Vivisection 1870-1910: Nineteenth Century Woman's Mission Volume Iii: Pro-Vivisection Writings* (London: Routledge, 2004).p. 311. Kean, *Animal Rights: Political and Social Change in Britain since 1800*.p. 272. Tester, *Animals and Society: The Humanity of Animal Rights*, Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*. p. 368.James Turner, *Reckoning with the Beast: Animals, Pain and Humanity in the Victorian Mind* (Maryland, USA: The John Hopkins University Press, 1980)., p. 190. Richard D French, *Antivivisection and Medical Science in Victorian Society* (Princeton, New Jersey: Princeton University Press 1975).p. 425. Nicolaas Rupke, ed., *Vivisection in Historical Perspective* (London: Routledge, 1990).

[533] Robert G. W. Kirk and Michael Worboys, *Medicine and Species: One Medicine, One History?*, ed. Mark Jackson, *The Oxford Handbook of the History of Medicine* (Oxford: Oxford University Press, 2012).pp. 561-77. Kirk, "The Invention of the "Stressed Animal" and the Development of a

literature devoted to the social history of the ethical debates surrounding vivisection but no interrogation into the relationship between the social history of vivisection and scientific histories of the laboratory animal. Consequently, as Kirk has rightly asserted, 'there has been no historical analysis of the role of animal welfare in the material practice of animal dependent laboratory science'.[534]

In this chapter, I draw on Kirk's paper 'The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986', to elucidate further his idea of stress and the relationship between the laboratory animal and scientists. However, I seek to highlight the entanglement of discourses of stress between the animal and women in this period. Kirk argues that the idea of stress facilitated a fifth aspect of change in the regulation of vivisection: that of the ethical aspect of scientist, animal and knowledge generated from experiments, as situated within interdependent networks of relationships.[535] Additionally, Kirk argues that the concept of stress 'provided a language by which traditional moral notions such as "well-being" could be reconfigured from a political rhetoric to become objects of scientific and economic knowledge materialised in physical spaces, scientific practices and legal regulations'. [536]

However, despite Kirk's novelty and initial foray into this area, his work lacks a much-needed critical focus. Current scholars within the discipline of Critical Animal Studies (for example Lynda Birke) and Feminist Science studies (Donna Haraway, Anne Fausto-Sterling and Helen Longino) can contribute towards, and enhance, the histories of laboratory animal science in mid-twentieth century Britain. Whilst these conceptual dimensions seem absent in Kirk's work, I wish to add a much-needed feminist/critical

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Science of Animal Welfare, 1947-1986."pp. 241-63. Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968."pp.62-94. Kirk, ""Standardisation through Mechanisation" Germ Free Life and the Engineering of the Ideal Laboratory Animal."pp.280-91. Kirk, "Between the Clinic and the Laboratory: Ethology and Pharmacology in the Work of Michael Robin Alexander Chance, C. 1946-1964."513-36. Robert Kirk, "Knowing Sentient Subjects: Humane Experimental Technique and the Constitution of Care and Knowledge in Laboratory Animal Science," in *Humans, Animals and Biopolitics: The More-Than-Human Condition*, ed. Kristin Asdal, Tone Druglitrø, and Steven Hinchliffe (Abingdon: Routledge, 2017).

534 Kirk, "Between the Clinic and the Laboratory: Ethology and Pharmacology in the Work of Michael Robin Alexander Chance, C. 1946-1964."p. 515.

535 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p. 243

536 Ibid.

animal studies presence to it. It is my intention to draw on feminist science studies scholars to 'fill in the gaps' of Kirk's work and contribute to expanding the current state of knowledge in this area, by relating historical narratives on the laboratory animal in medical science to broader social and cultural values of the time.

British Medical Science and the State

The two World Wars propelled British medical research into a new era and the state increasingly turned to science in the search for medical cures. For instance the typically "feminine" disease of hysteria was acknowledged as one that also manifested in men, and was coined as "Shell-Shock" (a form of post-traumatic stress as a result of soldiers' experiences on the battlefield).[537] Hence, there was a revival of interest in the psychological dimensions of ill health. In 1950s Britain it became commonplace to declare that there was an increase in mental health issues due to the changes in living conditions bought about by war, economic conditions and contemporary technological advances.[538]

Towards the end of the nineteenth century and beginning of the twentieth there was a transformation in biomedical science and the use of the animal body. Discoveries were made of a multitude of substances that contributed to the function of the human body, most notably, insulin, vitamins and hormones.[539] There was an exponential increase in the number of animals used for experimentation in this period, from 270 in 1879 to 958,761 in 1939.[540] As a result of this, the nonhuman animal became essential to the experimental scientist, and thus, became embedded in a series of networks that not only included the laboratory, but also the hospital, farm, slaughterhouse and government.[541] These networks of 'supply and demand' became more formalised in 1947 with the creation of the Laboratory Animals Bureau (L.A.B.) by the Medical Research Council

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537 Elaine Showalter, *The Female Malady*, 17 ed. (London: Virago Press, 1985; reprint, 2014). pp.167-168.
538 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p. 241.
539 Worboys, *Medicine and Species: One Medicine, One History?* p. 569.
540 Ibid. p. 570. Medical laboratories had to be registered under the Cruelty to Animals Act (1876) and licensed, alongside practitioners. See next chapter for details regarding the 1876 Cruelty to Animals Act, the registering of scientists, laboratories and how these figures were obtained.
541 Worboys, *Medicine and Species: One Medicine, One History?* p. 570.

(MRC).[542] This was coupled with the emergence of an ethics of scientist-animal relations in the laboratory with the publication of *The UFAW's Handbook on the Care and Management of Laboratory Animals*.[543]

The creation of the L.A.B. and the resultant publications it inspired came at a crucial juncture in the advent of post-war British modernity. It was at this time, as noted in the previous chapter, that scientists began to assume powerful positions within state departments. Scientists became key advisers to politicians with regards to the funding of scientific endeavours and in the formation of science policy.[544] It was the Second World War that provided the crucial turning point for the generation of science-government relations in Britain. Scientists amongst other specialists were integrated into the civil service in a way they had not been previously.[545] This is most clearly evidenced by the work performed by scientists at Porton Down and the creation of a specific research committee, the DRPC.[546] Paralleling this was the creation of the Advisory Council on Scientific Policy (ASCP), which had the function of advising high-ranking politicians on devising and implementing civil scientific policy, such as plans concerning contemporary medical research.[547] Accordingly, there was considerable overlap between the two committees. For instance, the Royal British Air Force requested a considerable amount of medical research to be conducted on the usefulness of amphetamines in enhancing the performance of its pilots in the mid- to late 1940s.[548]

Clearly, then, after the Second World War, the place of science and technology in government was becoming increasingly important.[549] In the middle of the century, British

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[542] The LA.B. was created for scientists so that they could get information regarding laboratory animal supply. It also acted in a regulatory capacity, to facilitate the breeding of a standardised animal that could be used in laboratories all over Britain.

[543] Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968.", Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p. 62.

[544] Philip Gummett, *Scientists in Whitehall* (Manchester, UK.: Manchester University Press, 1980), ibid. p.2.

[545] Ibid. p.28.

[546] See Chapter one for further details on this, also, Gummett, *Scientists in Whitehall*. p. 28-31.

[547] Ibid. p.31.

[548] Kirk, "Between the Clinic and the Laboratory: Ethology and Pharmacology in the Work of Michael Robin Alexander Chance, C. 1946-1964." P. 515 and also see; Nicolas Rasmussen, *On Speed: The Many Lives of Amphetamine* (New York and London: New York University Press, 2009). P.64-65

[549] Edgerton, *Warfare State: Britain, 1920-1970*. p.1

government was more technocratic and hence science and technology was becoming woven into the very fabric of the nation.[550] Eminent scientists ascended to high-ranking positions in the previously mentioned committees and, consequently, the corridors of Whitehall. Several figures, such as Henry Tizard, a prominent chemist, Sir John Cockcroft (Director of the Atomic Energy Research Establishment at Harwell), Sir Frederick Brundrett, chief government scientist, who was later replaced by Solly Zuckerman, a zoologist, in 1960,[551] became the most prominent and influential of government advisors during this time.

After the Second World War, a political system was introduced that was radically different from previous ones. The Labour Party, led by Clement Attlee, won the 1945 General Election with a dramatic victory over the Conservatives.[552] The party had promised the electorate a free health service, full employment and a welfare state, and they did this by embracing Keynesian economics. Consequently, in the March of 1946 the National Health Services Bill (NHS) was published.[553] The NHS bill aimed to give access to free healthcare for all, regardless of social class. This pivotal moment in British politics became the driving force for an increase in funding in medical research and its allied services.

Overall, while the majority of government funds were going on defence R&D[554] there was also an increase in government expenditure on civil R&D between 1945-1965. Part of this funding towards civil R&D went to the Medical Research Council (MRC), the leading organisation overseeing scientific endeavours in medicine. The funding the MRC received increased exponentially between the years 1945-1965, rising from £0.3m in 1945-6 to £7m in 1963-4.[555] It was partly a result of this increase of influence from scientists upon government and the funding from government to the civil science sector that determined the requirement that scientists should consider the ethical role of the experimental animal more in their research. It was the work of Hans Selye, a biochemist

[550] Ibid. pp.7-9.
[551] Gummett, *Scientists in Whitehall.* p. 31-33
[552] Vicente Navarro, *Class Struggle, the State and Medicine: An Historical and Contemporary Analysis of the Medical Sector in Great Britain* (London, UK: Martin Robertson & Co. Ltd., 1978). p. 38.
[553] Ibid. p. 39-40.
[554] See chapter four for specifics.
[555] Gummett, *Scientists in Whitehall.* p. 39.

at McGill University in Canada that assisted in raising awareness in British medical science of the need for a form of welfare in terms of the care and treatment of laboratory animals. Hans Selye, therefore, created conditions of possibility for the increase in the use of animals in medical experimentation. A shift in the construction of the nonhuman under dissection and a consideration of them as active agents in the world helped mark a turning point in the treatment of nonhuman laboratory animals.

Hans Selye and the General Adaptation Syndrome

> What is this one mysterious condition that the most different kinds of people have in common with the animals and even with individual cells, at times when much – much of anything – happens to them? What is the nature of stress?[556]

In the early twentieth century a small circle of Anglo-American medical scientists published papers concerning emotions in laboratory animals.[557] This in turn influenced the work of a hitherto unknown Hungarian physiologist called Hans Selye, whose account of stress in the mid-twentieth century followed on from the influential work of Walter B. Cannon, particularly his 1915 book, *Bodily Changes in Pain, Hunger, Fear, and Rage: An Account of Recent Researches into the Function of Emotional Excitement.*[558] Cannon's work influenced other scientists in the area of animal emotions. As a result, a small community of researchers cohered in the interwar years, dedicated to emotional disturbances in the nonhuman.[559] However, it was Selye's work on stress and adaptation that provided the turning point for recognition of a need for a science of laboratory animal welfare in mid-twentieth century Britain.

The first wide-ranging (and scientifically accepted) recognition that a sentient being could suffer from both physical and psychological 'stress' came in a short article published in *Nature* in 1936 by Hans Selye. It made reference to a host of external and internal 'nocuous agents' that caused a change in the living being's body and mind.[560] As a result of these various harmful agents, the article claimed, the living body responded in three stages. Firstly, the response is the 'general alarm reaction' then resistance to 'invasions'

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[556] Hans Selye, The Stress of Life
[557] Otniel E. Dror, "The Affect of Experiment: The Turn to Emotions in Anglo-American Physiology, 1900-1940," *Isis* 90, no. 2 (1999).p.218.
[558] Ibid. p. 219.
[559] Ibid.
[560] Hans Selye, a Syndrome Produced by Diverse Nocuous Agents, *Nature,* 4 July 1936. P.32.

and the final stage being adaptation. Towards the end of the article, Selye notes how 'since the syndrome as a whole seems to represent a generalised effort of the organism to adapt itself to new conditions, it might be termed the general adaptation syndrome'.[561] This short and subdued article did not mention the word 'stress' at all. However, despite its cautious tone, it was to trigger a paradigmatic change in British scientists attitudes towards the nonhumans in their service as laboratory animals.

In 1907, after completing his medical degree and doctorate in organic chemistry, Hans Selye later settled in the Department of Biochemistry at McGill University.[562] It was here that his earlier experiments on female rats - analysing ovarian hormones - paved the way for his development of the concept of the General Adaptation Syndrome.[563] Selye's most explicit description of his theory was in 1946 in a comprehensive article published in the *Journal of Endocrinology*.[564] Over one hundred pages long and featuring diagrams, photographs and charts, this article facilitated the general acceptance and use of the term 'stress' within medical circles and eventually in wider society, in the 1950s. It was his use and extension of contemporary hormonal and physiological theories that formed the bedrock of his General Adaptation Syndrome concept. Stress was seen as an acute reaction to external and internal incompatibilities with the body and Selye claimed it could be anything from 'diet, temperature [and] light' to 'heredity' and general 'constitution'.[565] He named these causes 'conditioning factors' and claimed that the adaptation syndrome was an 'indispensible physiologic defense reaction to damage'.[566] Influenced by Cannon's concept of homeostasis[567] and popular hormonal theories of the body,[568] Selye's concept of stress not only influenced intellectual discussion on mental illness but also (and somewhat ironically) the care and treatment of laboratory animals.

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561 Ibid.
562 Mark Jackson, *Evaluating the Role of Hans Selye in the Modern History of Stress*, in David Cantor and Edmund Ramsden, ed., *Stress, Shock and Adaptation in the Twentieth Century* (Rochester, USA: University of Rochester Press, 2014). pp.23-24.
563 Ibid.
564 Hans Selye, Hans Selye, "The General Adaptation Syndrome and the Diseases of Adaptation," *Journal of Clinical Endocrinology* 6, no. 2 (1946).
565 Hans Selye, *The Story of the Adaptation Syndrome Told in the Form of Informal, Illustrated Lectures* (Montreal Canada: Acta Inc, Medical Publishers, 1952). P. *Leitmotiv.*
566 Ibid.
567 "Stress and the General Adaptation Syndrome," *British Medical Journal*, no. 4667 (1950).
568 Mark Jackson, *The Age of Stress: Science and the Search for Stability* (Oxford, UK: Oxford University Press, 2013). p. 82-83.

In his writings, Selye was a passionate advocate of the use of animals for experimentation (rats, and later monkeys, were an integral part to his laboratory *modus operandi* throughout his entire career). He certainly did not question the use of them in his pursuit of professional recognition. In lectures given to medical audiences around the world at the height of his fame, and collected in and published as a book entitled *The Story of the Adaptation Syndrome,* Selye's description of the relationship of science to nature (and thus the nonhuman) was elaborated, and was reminiscent of Francis Bacon's treatise on the philosophy of science. His passion for science was communicated most clearly when he exclaimed that he derived great 'intellectual satisfaction… from forcing one's way, step by step, into the confidence of Nature' in order to 'understand her'.[569] This 'forcing one's way' into nature was via the use of animals. In his 1956 book, *The Stress of Life*, he came across as a zealous advocate of the use of the nonhuman in experiment:

> If we want to learn something about any aspect of life, we first need a sample of its pattern as expressed in the body of an animal or man. The structural organisation of living beings can often be studied by dissection after death, but vital processes can only be explored during life. Since it is not justified to perform dangerous operations on man, experimental animals are quite indispensible for such studies.[570]

Selye's position on animal use in science is clear. As we saw in the previous chapter, scientists studying the effects of chemical and biological weapons on the body had power over the animal in death. On the contrary, the medical science of stress exercised power over the *living* animal body. With Selye's impassioned opinions on the matter, he went on further to outline why the use of the nonhuman was important for medicine. Over two pages he described the medical breakthroughs made over the past one hundred years from using animals in experiments, claiming that 'a major step of progress in medicine has been based, at least partly, on animal experiments'.[571] He ended with a personal pronouncement on the matter:

> The better one understands the nature of life, disease and suffering, the more one becomes incapable of brutality. This thought was not the least important among the motives which led me to write a book on the nature of disease for those who are not professionally concerned with medicine. In our Institute last year, we

[569] Selye, *The Story of the Adaptation Syndrome Told in the Form of Informal, Illustrated Lectures*. p.15.
[570] Hans Selye, *The Stress of Life*, 2nd ed. (New York: McGraw-Hill, 1956). p.87.
[571] Ibid. p. 88.

> used about 1400 rats a week for research, but not one of them exposed to unnecessary pain because of carelessness.[572]

Animals were integral to Selye's theories on stress, and gave him the capacity to question nature. For Selye "nature" was 'the source of all knowledge – [and] rarely replies to questions unless they are put to her in the form of experiments to which she can say "yes" or "no". She is not loquacious; she merely nods in the affirmative or in the negative'.[573] In Selye's eyes, nature was female and science there to uncover the secrets that *she* beholds. Passive and shy, 'she will silently show us a picture'[574] of the world at large. And, it was through this perception of the natural world and his experiments on rats, that he could establish his theory on stress and the general adaptation syndrome, catapulting him to scientific fame in mid-twentieth century Britain.

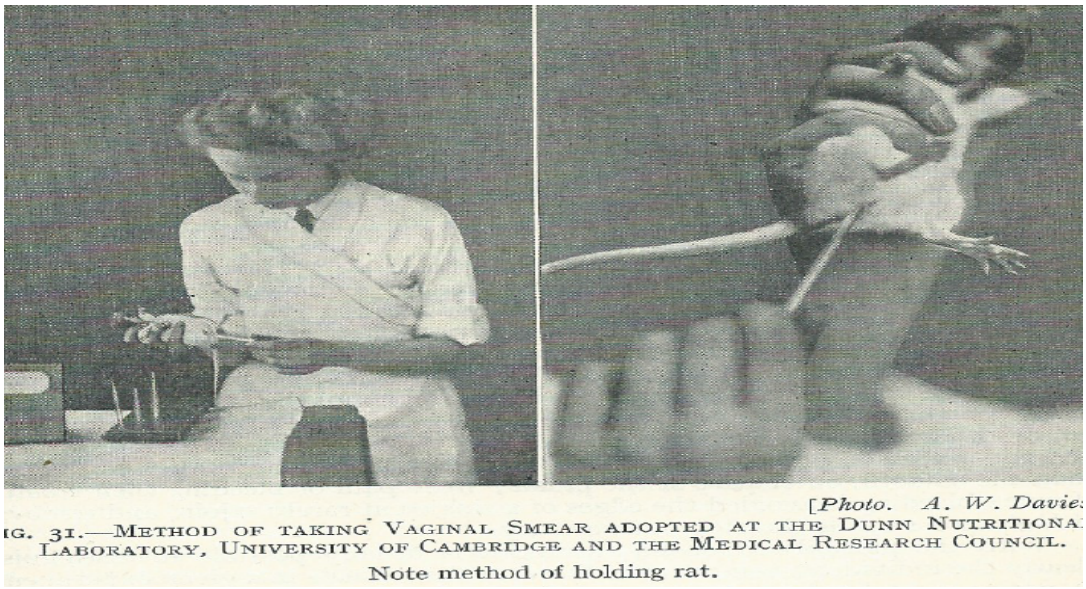
The UFAW Handbook: New Beginnings in Animal Welfare

The publications of Selye's 1946 article was a watershed moment in accepting that physiological disturbances in the body caused both psychological shock and stress to a living organism. It was this that consequently acted as the impetus behind the UFAW's handbook for the care and treatment of laboratory animals in the late forties. Alastair Worden, Professor and Director of research in animal health at the University College of Wales compiled and edited the *Handbook,* which was published by the UFAW. Chaired by Major C.W. Hume and with Professor Edward Hindle of the Zoological Society of London as its President, the UFAW sought to approach the nonhuman in ways that absented the 'emotional or sentimental' yet served the interests of science by building a 'realistically humane policy based on objective fact.'[575]

Formed in 1926 by Major C Hume,[576] the UFAW had a series of key objectives. One of the organisation's main objectives was to enlist the support of scientists in the 'subject of animal welfare, and to show that it has aspects which should appeal to them'.[577] Hence, the book provided guidance and advice on a variety of laboratory practices and animal husbandry, including; food preparation, cages and cage-equipment, experimental

572 Ibid. p. 89-90.
573 Ibid. p. 19.
574 Ibid. p. 19.
575 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*.
576 Burch, *The Principles of Humane Experimental Techinque*. p.166.
577 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*.

techniques, as well as information regarding a host of experimental animals from rabbits, guinea pigs, rats and mice, to pigeons, fish and ferrets.[578] This was followed up in chapters devoted to the perfect laboratory conditions and clear instructions for animal technicians and assistants. It was here that the gendered division of labour within the laboratory was explicitly highlighted, as 'many workers prefer women to men as animal assistants' (See figure one).[579]



[Photo. A. W. Davies
IG. 31.—METHOD OF TAKING VAGINAL SMEAR ADOPTED AT THE DUNN NUTRITIONAL LABORATORY, UNIVERSITY OF CAMBRIDGE AND THE MEDICAL RESEARCH COUNCIL.
Note method of holding rat.

Figure one: Female laboratory assistant with female rat, in Worden p. 127.

Laboratory Spaces and Gendered Places

Coupled with its acknowledgment that female animal assistants were preferable to the care and welfare of the laboratory animals, the *Handbook* devoted an entire chapter to the 'design and management' of the animal laboratory.[580] To envisage and advocate a standardisation of research laboratories went hand-in-hand with the advent of the standardisation of laboratory animals.[581] Uniformity was essential to post-war British

578 Ibid. p. xi.
579 Ibid. p.41.
580 Ibid. p.21.
581 To discuss the standardisation of laboratory animals here would take up too much space, but see: Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968."

medical science so that bodily processes of the nonhuman could be investigated and act as models for human diseases.[582]

Therefore, to standardise scientific medical research and its 'apparatuses' meant that the results of experiments could be generalised to wider populations – both human and nonhuman.[583] What emerges in the *Handbook* is a method to acquire and *create* particular kinds of scientific knowledge through 'careful and considerate management'[584] of laboratory spaces, the keeping of animals, how the animals are tested and the gendered divisions of labour within the laboratory.[585] By neglecting to do this it would:

> [S]eem futile to expect reliable results from the use of animals of mixed or unknown origin… housed in inadequate, dirty, parasite-infested, unevenly heated, badly ventilated, draughty, noisy or otherwise unsuitable surroundings, handled with fear or distaste and fed irregularly on diets containing bulky or rapidly spoiling foods of which the nutritive value has never been ascertained.[586]

Highly structured and sterile spaces were advocated as they were considered to facilitate valid experiments. But nevertheless, these spaces sought to constrain the behaviours of the nonhumans living in them. The 'animal house' was an area of the laboratory that kept the nonhumans prior to and (if they were not euthanized) after the experiments. The chapter details the requirements for the animal house, from the appropriate material required for construction, to the actual dimensions and sizes of cages. Cages were advised to be stored in racks – piled high on top of each other - and numbered so as to identify the individuals living in them (see figure two).[587]

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582 Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender." p.96.
583 Ibid. p.101.
584 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p.21.
585 Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender." p.98.
586 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p.21.
587 Ibid. p. 38.

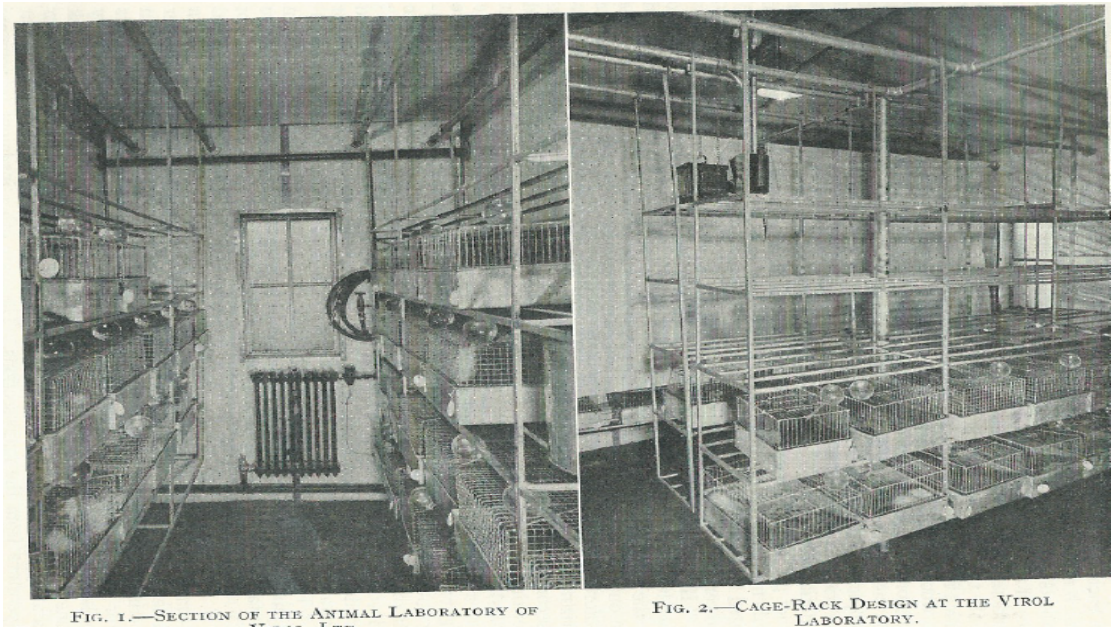

FIG. 1.—SECTION OF THE ANIMAL LABORATORY OF

FIG. 2.—CAGE-RACK DESIGN AT THE VIROL LABORATORY.

Figure two: Cage rack design in Worden p. 24.

Both apparatus and the nonhuman in the experimental laboratories were undergoing a transformation in terms of scientific practice. In effect, this was another way for scientists to control 'nature' by the use of technocratic management techniques, and preventing variation and individual difference amongst animals through standardisation and numbering.[588] Furthermore, the book advised that the animals be segregated according to sex and kept in small groups such as 'mothers with litters'.[589] The book asserts the fact that in rabbits 'unless the sexes are separated when 3 ½ to 4 months old, fighting and unwanted matings occur.[590] For guinea-pigs, 'the sexes may be mixed in the proportion of one male to five females.'[591] To segregate animals according to sex reflected the social assumptions of the time in relation to gender differences. These assumptions determined the very way that laboratory animals were to be kept and tested. Thus, the advice in the handbook was replete with social and cultural values that the authors were trying to obviate in the first place. The limited housing conditions and laboratory spaces, how and by *whom* they were handled would have affected the nonhumans' behaviour and physiology. Thus, the constrained laboratory animal became a distortion and re-construction of their actual behaviour in the wild. The information given in the handbook is itself a distortion of the nonhuman, alongside the very

588 Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender." p.100.
589 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p.22.
590 Ibid. p.73.
591 Ibid. p.97.

behaviour the book was trying to categorise – the use of reductionist logic, binary divisions and gender-specific practices.[592] Consequently, it was the very precisely defined physical spaces set out in the *Handbook*, which led the nonhuman to become the very embodiment of a fixed and particular array of conventions that sought to give credibility to the idea of animal experimental science in medicine.

Animal Experimentation and the Human Male Gaze: The Disciplinary Techniques of Laboratory Relations.

Through these specifically designed, managed and standardised laboratory spaces, came the development of gendered and species-segregated hierarchies of power. The manifestation of power in the laboratory, as discussed above, was highly gendered, and rested upon the dominance of the male gaze to aid this standardisation. The gaze then, was not simply neutral; there was a gender dimension to the authority of the gaze. For instance, a fundamental part of how women are positioned in society is through, what Laura Mulvey terms, the male gaze:

> In a world ordered by sexual imbalance, pleasure in looking has been split between active/male and passive/female. The determining male gaze projects its phantasy onto the female figure which is styled accordingly. In their traditional exhibitionist role women are simultaneously looked at and displayed, with their appearance coded for strong visual and erotic impact so that they can be said to connote to-be-looked-at-ness. [593]

The male gaze establishes a hierarchy of power, whereby reality and therefore vision, is constructed via the [human] man's view of the world, this in turn negates women's views of the world, and women become objectified and positioned as 'Other', alongside animals. The application of Mulvey's male gaze here, fits well the idea of a masculine science, using the methodological tools of observation to account for and control nonhuman bodies. This is akin to the idea of 'to-be-looked-at-ness' stipulated by Mulvey. Furthermore, this idea of the male gaze can be linked to the notion of disciplining bodies and regulating their behaviour.

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592 Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender." P102.
593 Laura. Mulvey, "Visual Pleasure and Narrative Cinema.," in *Film Theory and Criticism : Introductory Readings.*, ed. Leo Braudy and Marshall Cohen. (New York and Oxford: Oxford University Press, 1999). P.837.

One of the ways to manage bodies and behaviours is through surveillance, and it was in Foucault's work on the penal system that he alluded to the 'Panoptican'.[594] Jeremy Bentham, an eighteenth century utilitarian, designed the panoptican, a type of prison building, which ensured guards could view the cells and all the prisoners from a centrally positioned tower on the jail's site.[595] The prisoners would not know if they were being observed and hence, adjust their behaviour accordingly.[596] Foucault sees the logic of the Panoptican as an example of disciplinary forces acting on the body.[597] In other words, the best way to enable prisoners to behave was through the operation of power over them which made them think they were constantly being observed, and were the targets of the authority's gaze at all times.

The disciplinary gaze was not confined to the prison, but moved throughout the various institutions of society such as the factory and school. Nor did it reside in one particular person, but formed part of the very institutions themselves. [598] It is this concept of the disciplinary gaze that can be applied to understand the ideals set out in the *Handbook* for laboratory spaces. A disciplinary *male* gaze over the laboratory was constituted through the work of the UFAW and Laboratory Animals Bureau. Laboratories and nonhuman animals became standardised in mid-twentieth century Britain via the dissemination of the UFAW's discourses of care towards the laboratory nonhuman. The gendered, male gaze over the nonhuman animals' living bodies became essential in order to postulate the very symptoms of the condition of stress. As Foucault describes:

> The human body was entering a machinery of power that explores it, breaks it down, and rearranges it. A 'political anatomy', which was also a 'mechanics of power', was being born; it defined how one may have a hold over others' bodies, not only so that they may do what one wishes, with the techniques, the speed and the efficiency that one determines. Thus discipline produces subjected and practiced bodies, 'docile' bodies.[599]

This creation of docile nonhuman bodies echoes Foucault's analysis of disciplining human bodies from the eighteenth century onwards. The techniques of welfare were promulgated by the UFAW in the name of creating an economics of efficiency in laboratory human-animal relations: reducing wastage of animals, improving their physical

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[594] Foucault, *Discipline and Punish: The Birth of the Prison*.pp.195-228.
[595] Ibid. pp.200-201.
[596] Ibid. p.201.
[597] Ibid. p.202-204.
[598] Ibid.p.205-206.
[599] Ibid. p.138.

and psychological health in order to make experiments more valid and housing animals in clean conditions so as to reduce the occurrence of extraneous variables such as certain diseases that were not part of the experimental procedure. Again, like Foucault, through the mechanisms of laboratory human-animal relations in mid-twentieth century Britain, this idea of welfare increased the animal body's utility and therefore increased the power the human [male] had over the nonhuman body, establishing 'in the body the constricting link between an increased aptitude and an increased domination'.[600] In other words, scientific welfarism created healthier animals but in doing so, increased regulation, control and domination over the nonhuman body to ensure their healthiness was fit-for-purpose.

Constructed through the discourse of stress, the actual material spaces of the laboratory, as we saw above, became gendered and heavily disciplined spaces of care and welfare. The laboratory and animal house that accompanied it had a specific design and layout reminiscent of Foucault's allusions to Bentham's panoptican. Figure three shows a design of an animal house to be used by laboratories for experimental purposes. It is taken from the second edition of the UFAW *Handbook*[601] edited by Dr Lane-Petter, of the Laboratory Animals Bureau, and member of the Research Defence Society (see chapter six).

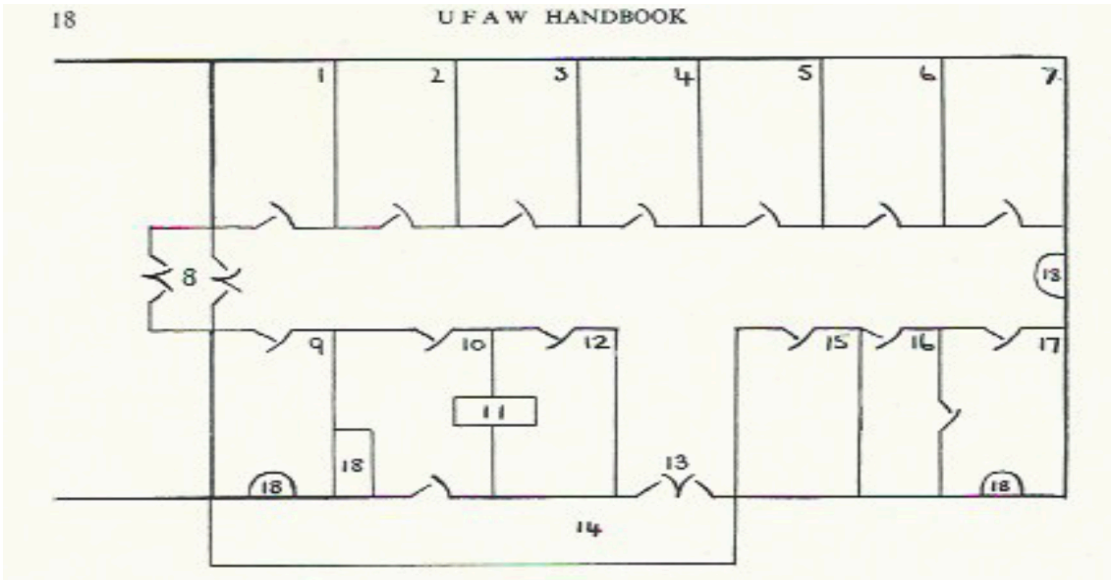

Figure three: UFAW Handbook (1957:18) 'Scheme of Animal House'.

[600] Ibid.p.138.
[601] Alastair Wordern and W. Lane-Petter, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*, 2nd Edition ed. (London: UFAW, 1957). p.18.

The design of the animal house is very much from the perspective of the human [male] gaze. A corridor runs between rooms that contain rows and racks of cages piled on top of each other, this allowed for full visibility of the animal, at all times. Rooms (9,10,12) were areas for post-mortems, cage washing rooms, a store for clean cages. Animals were segregated according to their purpose, rooms 1-3 for experimental animals, 4-5 for newly purchased guinea-pigs and rabbits, and 6-7 for the breeding of rats and mice, so that the experimenters' 'stock' would not diminish.[602] This segregation aided the experimenters by sight; visually mapping the animal house enabled the gaze over the nonhuman body to become permanent, even in death, through the construction of a post-mortem room:

> This enclosed, segmented space, observed at every point, in which the individuals are inserted in a fixed place, in which the slightest movements are supervised, in which all events are recorded, in which power is exercised without division, according to a continuous hierarchical figure, in which each individual is constantly located, examined and distributed among the living beings, the sick and the dead – all this constitutes a compact model of the disciplinary mechanism.[603]

This disciplinary male gaze over the nonhuman animal not only entrenched a standardised view of the nonhuman but also created a body that was docile, yet still objectified. It was only through the gaze of the scientist that the status of nonhuman animals changed, and a whole set of discourses and practices surrounding laboratory animals became established via the principles advocated in the *Handbook*.

And, indeed, the UFAW *Handbook* was praised for its insight and its philosophical approach to the science of animal welfare. A review in the *British Medical Journal* by A. L. Bacharach praised Worden for his 'common sense' approach towards animals and their use for experiments.[604] Bacharach hailed the book as 'indispensible' due to its 'practical blend of economics and humanitarianism'.[605] Emphasis was placed upon the economic rewards that would be reaped by scientists if they treated their laboratory species' with 'kindness'. A sly dig was also directed at the antivivisectionists: the 'common sense' approach to animals, as opposed to the 'sentimental' one, meant that 'healthy contented animals' would provide 'more information… than… sick and miserable animals'. This

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602 Ibid.
603 Foucault, *Discipline and Punish: The Birth of the Prison*. p.197.
604 A. L. Bacharach, "Review: Laboratory Animals," *British Medical Journal* 4617 (1949). p.20.
605 Ibid.

book therefore had hidden depths, as behind the technical descriptions of keeping animals, lay 'shrewd tactics' utilised by the book's 'level-headed planners, who are willing to run with the laboratory hares in the most friendly association, provided they are not also expected to hunt with the anti-vivisectionist hounds'.[606] Sentimentality was too feminine and qualitative to enter into the science of animal welfare, and seemingly this book deflected the antivivisectionist critique by claiming scientific rationality, humanitarianism and care towards animals. It was through these tactics that the UFAW reshaped laboratory relations between the human and animal in this period, and challenged the current legislation on animal experiments.[607]

The 1876 Cruelty to Animals Act (see next chapter), defined pain in purely physiological terms. The *Handbook* instead provided scope for a redefinition of pain and acknowledged the psychological dimensions of the laboratory animal. Yet it did admit that a great deal of work in this area had to be done:

> There appears to be room for a good deal of research into the psychological conditions that make a happy and contented stock. Captive animals may suffer acutely from boredom, and the certainly need exercise, companionship and opportunity to play. Most rodents appear to be agoraphobic and appreciate a nestbox or hut into which they can retreat, and they like to store food. How far such wishes be gratified depends, no doubt, on experimental requirements… but there is room for ingenuity and research in the matter.[608]

The use of subjective words such as 'boredom' and 'companionship' demonstrate an underlying paradox of this science of animal welfare. Firstly, animals were imbued with subjectivity, yet at the same time still perceived as objects of study – or 'stock'. The nonhuman had been re-constructed as an active agent in the world, yet one which was still objectified. How can one have 'happy and contended stock'? Surely this is a misnomer? The etymology of the word 'stock' denotes the 'total amount of goods available'[609]; it refers to material objects rather than sentient beings. In spite of this contradiction, the UFAW still challenged the legal definition of pain in the nonhuman and afforded them a degree of subjectivity that was far removed from the Cartesian principle of the nonhuman being a machine. This individualising of laboratory animals

606 Ibid. p. 21.
607 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." P. 243.
608 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p. 19
609 *Collins English Dictionary*, (Glasgow, UK: HarperCollins, 2006).

was also a form of power over the nonhuman body that combined with the spatial layout of the laboratory, and rendered nonhuman animals, through the male gaze, even more subjugated in the relations of power-knowledge. This individualisation via the male gaze created subject-object binaries that were masculinist and had implications for both animals and women:

> All the authorities exercising individual control function according to a double mode; that of binary division and branding (mad/sane; dangerous/harmless; normal/abnormal); and that of coercive assignment, of differential distribution (who he is; where he must be; how he is to be characterised; how he is to be recognised; how a constant surveillance is to be exercised over him in an individual way, etc).[610]

Yet, despite this almost unconsciously expressed Cartesianism, Descartes' influence on science is both acknowledged in the introduction of the *Handbook* and at the same time challenged its author, Professor T. Dalling, Director of the Veterinary Laboratory for the Ministry of Agriculture and Fisheries. It was here that Dalling claimed that the Cartesian view of animal-as-machine was obsolete 'in view of what is now known of the biological relation between man and the lower animals'.[611] And yet, according to Dalling, 'this queer heirloom bequeathed by the great-grandfather of modern science is still lying about in intellectual lumber-rooms'.[612] In other words, Dalling was sure that the advocacy of Cartesian ideas was becoming rare and was increasingly being dismissed by scientists as erroneous. Yet, it still persisted in some areas of scientific research. Was this true? Or were laboratory science and its methodologies still Cartesian in their material practice but disguising their assumptions through a changed performance of semiotics? Dalling elaborated on this point by offering a statement on the need for an acceptance of subjectivity in laboratory human-animal relations. He philosophised on how his:

> [O]wn subjective consciousness is the sole source of any conception I can form of any mental state, painful or otherwise. I cannot inspect another man's mind, and when I picture it or converse with him I have to use my own thoughts and feelings as symbols of his, interpreting his observable reactions in terms of my own. It is impossible to prove that his mind exists outside my imagination, for every attempt to refute metaphysical solipsism will be found to beg the question; the justification for a transcendent interpretation of my experience is the pragmatic one, that it enables me to control the latter. The same interpretation is applied to the behaviour of animals, with the same justification, by trainers,

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610 Foucault, *Discipline and Punish: The Birth of the Prison*. p.199
611 Professor T. Dalling, Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. p. 18
612 Ibid.

> trappers and others who have to deal with them. Finally, while human beings can escape from the severer levels of pain by swooning, it seems doubtful whether most animals, if any, can do so.[613]

To advance such a bold statement about the ontological nature of existence shows how the epistemological foundations of science were being shaken by the notion of animal stress and the ability for the nonhuman to feel pain. In an era dominated by 'experts' who advised government on contemporary policy-making decisions that would affect all aspects of British life - from welfare, healthcare, and the family, to war and the need for weapons of mass destruction – scientists *needed* animals. But, they did not want to face the challenges to vivisection to such a degree as the nineteenth century scientists did in response to those antivivisectionists who, they claimed, sought to stifle human 'progress'.[614] Medical scientists needed a get-out clause, and Selye could help with this. Hence, this 'turn to subjectivity' would have its economic, social and political advantages for some scientists in the post-war era. The UFAW *Handbook* was just sowing the seeds for the development of a different kind of power over living beings – a power over life, which involved an anthropocentric and *androcentric* understanding of subjectivity.

'Stress Without Distress': The Scientific Basis of Kindness to Animals

> In stressful investigations, there seems at first sight an irreconcilable conflict between the claims of humanity and efficiency. For how can we eliminate, or even reduce, the distress imposed [on animals] without prejudicing the end [of the experiment] in view?… There is grounds for hope that, perhaps when a little more is known, the responses themselves may be evoked, as required, by intervention at a more peripheral or co-ordinative level than that of the sites of integration of distress itself. In other words, we may soon be able to get *stress without distress*.[615]

After the success of the *Handbook,* the UFAW continued to publish work about laboratory animal welfare. It was after its publication that scientists began to accept the legitimacy of the psychological dimensions of pain and suffering an animal could withstand when in laboratory environments. What the UFAW did was to rationalise and objectify animal emotions in the laboratory. They moved away from philosophical and

613 Ibid. p. 18.
614 French, *Antivivisection and Medical Science in Victorian Society*.
615 Burch, *The Principles of Humane Experimental Techinque*. p. 135.

emotive descriptions of pain, fear and distress in the animal, as favoured by the antivivisectionists, and developed a new discourse of animal morality. This discourse was deployed to legitimate the continued use of even more animals in medical experimental procedures.

This section unpacks this discursive strategy by focussing on the UFAW publications about animal laboratory welfare in the 1950s and early 1960s. As has been mentioned, it was this organisation that led the way in fashioning a language of animal-use as 'humane'[616], which legitimated animal experimentation. Further, the idea of animal psychological-stress prompted the consideration of a change in scientific methodologies and practices associated with medical experiments on animals.

Alongside the *Handbook*, it was the publication of John Baker's *The Scientific Basis of Kindness to Animals* in 1948 (subsequently re-issued in 1951 and 1955) which set the tone for the animal welfare movement in the early post-war period. It was Baker himself who positioned the emergent discourse of animal welfare as a 'movement' and defined it as being 'concerned primarily with the consciousness of suffering'.[617] However, this consciousness of suffering was hierarchical and subject to an age-old scientific episteme that ordered nonhumans according to their closeness (physiologically) to humans:

> it is chiefly animals that live in groups and have special habits in relation to social life and young animals tended by parents, that call attention to their sensation of pain in a way that is obvious to us… a non-social animal gains nothing by calling attention to pain or fear.'[618]

These 'social animals' described by Baker are mammals and vertebrates and the 'lower animals' were deemed as those who were invertebrates. To acknowledge the subjective was suitable only when considering those animals that were considered to be closer to humans. Baker asserted that there was a 'good reason to suppose that some of the higher animals may suffer as a result of purely psychological causes; from fear, for instance'.[619] But for amphibious nonhumans their forms of consciousness were questionable (it

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[616] Ibid.
[617] John R. Baker, "The Scientific Basis of Kindness to Animals," (Tunbridge Wells: Universities Federation for Animal Welfare, Courier Co. Ltd, 1955). p. 3.
[618] Ibid. p.4.
[619] Ibid. p.4.

should be noted, amphibians must have been a 'lower' kind of vertebrate for Baker, compared to the mammal):

> When we drop some acid onto the skin of the hind leg of a frog, the animal will kick out and hop away. One may perhaps regard this reaction as a deliberate attempt to escape a source of injury. The frog will also kick out with its back legs, however, in response to the same stimulus, if the brain has previously been removed. Now in the absence of the brain no physiologist would consider that the animal could be conscious, and the apparent attempt to escape the source of injury by extension of the back legs cannot therefore be regarded in itself as a proof of the existence of pain.[620]

Consciousness and the ability for the nonhuman to feel pain which had its origins in the physiological was only attributed to the group of animals known as mammals. For Baker, it was the mammalian vertebrates who were endowed with the gift of awareness and sentience, but for those in the lower echelons of the scientific animal order of things, it was 'much harder to obtain evidence as to whether [they] are conscious'.[621] Furthermore, what Baker bestows upon the nonhuman is an *a priori* assumption about animal responses to pain, largely borrowed from pre-existing frameworks that reflect his experiences of human society. In other words, Baker and the UFAW were guilty of anthropomorphism via his interpretation of their behavioural responses, in categories already presupposed – especially in relation to those mammalian species that were most similar to humans.[622]

Read alongside the UFAW *Handbook* on animal husbandry, Baker's treatise on animal consciousness provides us with the starting point from which we can discuss the new science of animal welfare in mid-twentieth century Britain. Furthermore, it shows us how mid-twentieth century British medical science was beginning to problematize the idea of animal suffering in the laboratory, and to act as a crucial point within which the care of laboratory animals interrelated with the power scientists had over laboratory animals. There was no neat dividing line between care and power. Fundamentally, this acknowledgment of animal subjectivity was produced by a change in the way laboratory based scientists observed and were told to observe, the nonhuman.

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[620] Ibid. p.3.
[621] Ibid. p.11.
[622] Birke, "Telling the Rat What to Do: Laboratory Animals, Science and Gender." p. 95.

The recognition that (some) animals in the laboratory could suffer psychologically opened up a new area of scientific expertise,[623] and thus enabled the scientist to enter into a new form of observation over the animal body. No more were animals to be used and treated as mere objects of research; instead, they had to be cared for in the name of scientific efficiency, cost and time management.[624] This practice of observation was produced through the recognition of consciousness and subjectivity in the animal and by the concept of Selye's concept of stress.

In 1954, the UFAW funded another research project that intended to outline a welfarist approach towards laboratory animal science.[625] Buoyed by the success of the *Handbook*, the UFAW enlisted two scientists to continue its work into laboratory animal welfare: W.M.S. Russell, UFAW research fellow, Department of Zoology and Comparative Anatomy, University College London, and, R.L. Burch UFAW research assistant. This time the focus was not going to be on animal husbandry and laboratory spaces, but rather, the very methodologies employed by scientists to conduct their experiments.

With contributions from several distinguished scientists in the fields of ethology, physiology and zoology, including Professor P.B. Medawar, as chair of the Consultative Committee for the book,[626] and Dr Lane-Petter head of the Laboratory Animals Bureau,[627] the book was intended to be a contribution towards the celebrations of the centenary of Charles Darwin's *The Origin of Species*.[628] With Russell taking the main editorial lead,[629] the book became known as *The Principles of Humane Experimental Technique*. The book recognised that:

> It has sometimes seemed that there is an irreconcilable conflict between the claims of science and medicine and those of humanity in our treatment of lower animals… The conflict disappears altogether on closer inspection, and by now it is widely recognised that the humanest possible treatment of experimental

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623 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p.257.
624 Burch, *The Principles of Humane Experimental Techinque*. p. 155.
625 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986.", Burch, *The Principles of Humane Experimental Techinque*. p.xiii (P250 – Kirk).
626 Burch, *The Principles of Humane Experimental Techinque*. Ibid. p. xiii.
627 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p.250.
628 Burch, *The Principles of Humane Experimental Techinque*. p. xiv.
629 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p.250.

> animals, far from being an obstacle, is actually a prerequisite for successful animal experimentation.[630]

The aim of the book was to demonstrate the links between 'humanity and efficiency', in the treatment of animals during the course of experiment – the very methodologies of experimental science were being questioned.[631] The book's authors suggested that it represented the starting point of a 'new science' of humane experimentation because of its interdisciplinary approach, and its establishment of a set of 'general principles' for this 'new subject'.[632] However, the humane principles were only applied to a certain kind of nonhuman, the vertebrates, for reasons of 'simplicity and clarity'.[633] It was against this background that the book proposed differing ways of assessing pain, measuring subjectivity and imparting guidance for a more humane approach towards those nonhumans with a backbone.

Stress, Distress and Fear: Selye's Influence on the UFAW's Humane Experimental Technique

Russell and Burch proposed a 'psychosomatic' approach to this new construction of the lab animal.[634] This was a branch of medicine which stipulated the link between the mind and the body and rejected the historical propositions of the Cartesian idea of the mind-body binary. The authors claimed that 'the mind-body dichotomy is an entirely pathological fantasy… first thrust upon science by Descartes'.[635] As will be recalled, the disavowal of Cartesian principles was first suggested in the *Handbook* and echoed by Hume in the *Humane Experimental Technique*. This time the idea was conceptualised through the ideas of Hans Selye and his General Adaptation Syndrome. The book was replete with Selyian ideas and language associated with stress and the nervous system, and the hormonal and endocrine changes the body underwent during periods of ill health. But, as the authors suggested, 'it is regrettable on humane and scientific grounds that so large a proportion of the study of psychosomatics in animals has so far been carried out with the bludgeon of 'stress' of the more severe kinds'.[636] It was at this point

630 Burch, *The Principles of Humane Experimental Techinque*. p.3-4.
631 Ibid. p.4-5.
632 Ibid. p.5-6.
633 Ibid. p.6-7.
634 Ibid. p.10. Also see: Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p.250.
635 Burch, *The Principles of Humane Experimental Techinque*. p.11.
636 Ibid. p.12.

that the authors emphasised the importance of assessing more 'subtle interactions' between behavioural and physiological states in lab animals.[637]

Interestingly, the studies mentioned regarding the more indirect stressful states in the nonhuman are directly related to experiments conducted on animals concerning reproductive physiology, as it was claimed that in this particular branch of medical research 'we know most about the complex effects of the physical and social environment on endocrine control units'.[638] Furthermore, the exploration of these subtle states was justified by Russell and Burch with reference to modes of synchronisation in reproductive states of mating and ovulation in a female nonhuman. The authors refer to the female oestrous cycle, claiming that 'the female will only mate (or is only attractive) at a period suitably timed with her own spontaneous ovulation' and this depends on their social environment. Hence, stress and lab animal distress was distinguished as being produced in seemingly termed 'trivial' or inconsequential circumstances.

The idea of the social environment being a precursor to stress in the nonhuman was based on the Selyian ideas of hormones interacting with the social environment and hence used hormonal models of the animal body as an explanation for distress. Although semantically the book was asserting a viewpoint which eschewed the Cartesian principles of mind-body separation, in actual fact the binary was still very much in place. As Evelyn Fox-Keller asserts, in the mid-twentieth century, biology and its affiliated disciplines became accepted members of the scientific community through the idea of the body – both human and nonhuman – as a 'chemical machine'.[639] Reference is made in the book to the usefulness of cybernetics – a science that prioritised the idea of communications, feedback routes and automatic control systems in both machines and living beings – by claiming that 'this new science has the virtue of being a synthetic one' as 'part at least of biology is by now an industry, and in the cybernetic age no industry can afford to dispense with corrective feed-back or with the systematic scanning of techniques'.[640] Hence, the nonhuman body in medicine, as well as the human body, was now a cybernetic machine, autonomous and 'capable of constructing itself, maintaining itself,

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637 Ibid.
638 Ibid.
639 Fox-Keller, "Language and Ideology in Evolutionary Theory: Reading Cultural Norms into Natural Law." p.154.
640 Burch, *The Principles of Humane Experimental Techinque*.p.6.

and reproducing itself.[641] To draw on Donna Haraway, the nonhuman body became a cyborg.[642] A cyborg is a 'cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction'.[643]

However, where Haraway posits that cyborgs have disintegrated the traditional boundaries of mind/body, nature/culture, I want to argue that the work of the UFAW in this period actually reinforced these polarisations. The semantics of the science proposed by the UFAW formed a new kind of dominance over nature. The boundaries between what Michael Lynch calls the 'naturalistic' animal and the 'analytic animal' in the lab had become blurred.[644] The UFAW were reshaping and re-constituting the nonhuman animal in the laboratory, and the book was contributing towards this definition.

The *Handbook* seemed to provide a rigorous foundation for all of lab animal science and the general methodological assumption underlying this field of expertise was accompanied by social expectations about the maintenance of the ideal animal body for scientific experiment. This was of course resting on Selye's ideas of hormonal contributions to ill health as well as cybernetic notions concerning the body as a machine. Selye himself, in his 1949 paper (mentioned above), constructed his theories around the mechanico-reductive model of the body. As Helen Longino asserts, these scientific models, which give priority to the role of hormones in addressing behaviour, are in fact linear and reductionist. She dubs this 'The Linear-Hormonal Model'.[645] Here, the model bases all behavioural and sex differences on the hormones, but we can also apply Longino's model to the propositions espoused by Burch and Russell, with their emphasis on animal psychosomatics, hormonal and endocrine mechanisms in preserving wellbeing in the laboratory animal. With their idea of the behaviour of nonhumans as an outcome of a fixed and irreversible set of processes initiated by exposure to certain hormones at certain points in their lives:

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641 Fox-Keller, "Language and Ideology in Evolutionary Theory: Reading Cultural Norms into Natural Law." p.154.
642 Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature.*
643 Ibid. p.149.
644 Lynch, "Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences.." See chapter two for further discussion on Lynch.
645 Longino, *Science as Social Knowledge: Values and Objectivity in Scientifc Inquiry.* p. 135.

> The psychosomatics of experimental animals is perhaps the most important single subject for the development of humane and efficient technique in animal experiments. If we may by this time use the tag without fear of Cartesian implications, the motto of the experimenter in his dealings with his subjects must be *mens sana in corpore sano*, and he will not get the one without the other.[646]

Mens sana in corpore sano meant having a 'sound mind in a sound body'. Hence, the lip service paid to the rejection of Cartesian principles. In fact, the idea of having a sound mind *in* a sound body renders visible the discourse of the body as a machine with the mind, although part of the body, still dependent on physiological mechanisms for 'its' use, rather than the two being interdependent. This is most explicitly recognised when the authors discuss pain, fear and distress in the nonhuman and their capacity to experience certain dispositions or moods: 'the sequence of moods in a lower animal… is rigidly controlled by internal and external changes according to a code of rules, largely pre-set for a given species', and hence, of course 'in this respect, animals are functionally similar to neurotic humans'.[647] Furthermore a measurement scale was proposed to measure wellbeing and distress in the nonhuman.[648]

By moving from a notion of pain to one of distress, the idea was for medical science to emphasise wellbeing of the animal and thus would allow for the embedding of quantifiable techniques both prior to the use of the animal for experiment and during experiment.[649] With the authors defining stress 'as a central nervous state of a certain rank on a scale, in a direction of the mass autonomic response *which, if protracted, would lead to the physiological stress syndrome'*[650] Distress and consciousness became a variable for measurement and accountable to the experimenter. What Burch and Russell did was recommend ways of reducing distress and enhancing wellbeing through a discussion on ways to reduce, replace and refine animal experiments:[651]

> Replacement means the substitution for conscious living higher animals of insentient material, Reduction means reduction in the numbers of animals used to obtain information of a given amount and precision. Refinement means any

646 Burch, *The Principles of Humane Experimental Techinque*. p.13.
647 Ibid. p.17.
648 Ibid. p.22. Also see: Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." p.251.
649 Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." Ibid. p.251.
650 Burch, *The Principles of Humane Experimental Techinque*. p.24.
651 The 3R's, still used today in laboratories and enshrined in current animal experimentation legislation.

> decrease in the incidence or severity of inhumane procedures applied to those animals.[652]

These 3 R's acted as a foundation from which medical science could reshape laboratory relations and re-construe the nonhuman. But, what actually occurred was a change in the semantics, or ways of speaking about laboratory animals, and not necessarily the material practice of medical laboratory animal science. For Replacement the authors continued to justify the use of nonhuman animals through the concepts of absolute and relative replacement.[653] The stated aim was to completely replace vertebrate animals under experiments with either invertebrates or plants. Instead the focus remained on relative replacement where animals were still required but 'in actual experiment they are exposed, probably or certainly, to no distress at all'.[654] Moreover, the concept of Replacement was defended through:

> [T]he case of non-recovery experiments on living and intact but completely anaesthetized animals. Provided the anaesthesia is general and sufficiently deep, and its time-course properly synchronised with the treatment itself, such experiments are totally free from inhumanity.[655]

Coupled with this was the emphasis on Replacement in which experiments using animals would fit the criteria of Replacement if they were painlessly killed afterwards as 'this already constitutes a further advance' in humane experiments 'provided the euthanasia is satisfactory and provided there is substantial reduction in numbers, such experiments are beyond reproach'.[656] Reduction and refinement of the use of animals were consequently justified on the nature of the experimental technique used and the ability to quantify results of experiments.

Ironically, in the 3 R's, what the authors were proposing was a way to perceive the nonhuman differently, not just as passive objects but active agents in the world. However, the nonhuman was re-shaped into an active *object*, a new form of tool, for a new version of science, one that had to be made more efficient in a post-war world of medical research. Thus, this new biological science was achieved through still seeing the nonhuman body as a *machine-like-object*. Reducible to their component parts and

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652 Burch, *The Principles of Humane Experimental Techinque*. p. 64.
653 Ibid. pp.70-75.
654 Ibid. p.70.
655 Ibid. p.71.
656 Ibid.

psychological factors controlled via these biomechanical constituents through a series of feedback loops.[657] This is most evident in the discussion concerning direct and contingent inhumanity. Direct inhumanity was seen as the infliction of 'distress' as an 'unavoidable consequence' of the experiment, whereas contingent inhumanity was the 'infliction of distress as an incidental and inadvertent by-product' of the experiment.[658]

It is here that we can perceive the historical continuity of the influence of the Cartesian method, as argued elsewhere in the chapter. Despite the UFAW's and authors' rebuke of Descartes, the mechanistic nature of the conceptions of the nonhuman extended into the new epistemologies of scientific welfarism. This post-Cartesian epistemology[659] established a claim to the authority of medical science in a post-war world. It became a way of disciplining bodies, most notably nonhuman bodies, but also, as we shall see gendered human ones, through the power of the gaze and through the manipulation of the physical spaces laboratory animals were residing in. This form of social control was product of the broader social and cultural milieu of the time, one which embedded and embraced a notion of modernity which was drawing on historical paternalistic modes of thought and practice.[660] These paternalistic impulses were at once entrenched in wider society and the laboratory, through the persistence of the scientific discourses of hierarchy, both within the animal kingdom, and in human society in the form of hierarchies of stratification according to social class, gender and race.

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[657] In Kirk, "The Invention of the "Stressed Animal" and the Development of a Science of Animal Welfare, 1947-1986." the idea of *The Principles* is seen as a 'starting point for reimaging the laboratory animals' (p.251/252). However, Kirk and I differ here, as I argue it is *not* a reimagining of the nonhuman, nor the birth of an ethical discourse in science in relation to nonhuman use. Rather, it is a semiotic shift in human-animal relations, not a material one. The semiotics of animal welfare set out to produce new discourses and ideologies about the nonhuman, whilst experimental techniques and physiological theories of the animal remained the same. Nonhuman animals were still promoted by the UFAW as being experimentally essential for the discovery of medical cures.

[658] Burch, *The Principles of Humane Experimental Techinque*. p.54.

[659] Naomi Scheman, "Though This Be Method, yet There Is Madness in It: Paranoia and Liberal Epistemology," in *Feminism and Science*, ed. Evelyn Fox-Keller and Helen E. Longino (Oxford: Oxford University Press, 1999). p.210

[660] Lawrence, "Paternalism, Class and the British Path to Modernity." p. 147.
NB: The definition of Paternalism simply means a way of managing populations and individuals in the manner of a father dealing with children. Inevitably this is a form of patriarchy.

When the Distressed Animal Became the Neurotic Woman

As will be recalled, within the writings of the *Principles of Humane Experimental Technique* reference was made likening the distressed laboratory animal to the neurotic human.[661] It was in 1950s and early 1960s Britain that Selye's ideas of stress were synthesised with psychological markers of distress in the human. These ideas of stress overlapped with notions of women's health and mental health, sex-appropriate behaviour, sexual intercourse and the role of hormones in the development of sex differences. From the interwar years to the early 1960s, the idea of hormones, and more specifically sex hormones, became the new paradigm for medical science to operate from.[662] With the introduction of the contraceptive pill to British women in 1961,[663] it would seem that medicine and science revolutionised cultural life by giving women more control over their bodies. However, that in itself did not transform the power relationships between men, women and scientific constructions of sex, gender and incidentally, animality.

This section explores Selye's ideas of stress and how it links to the intersection between animals and the construction of women, specifically in relation to discourses on pre-menstrual stress. For instance, it should come as no surprise to know that prior to the first wide-scale human trials of the contraceptive pill, nonhuman animals were used, mostly rabbits and mice, because of their varied but equally similar oestrous cycles to female humans. Experiments were conducted throughout the 1950s in order to find out the levels of toxicity of the different substances and their propensity to inhibit ovulation.[664] Furthermore, some of the initial human trials of the contraceptive pill in the United States used psychotic women who had been diagnosed with schizophrenia and depression, and who were confined to asylums.[665] It is here, then, that we can begin to explore the dependency that medical research had on women and animals for both the testing of new drugs, and the contribution it made to the construction of broader cultural ideas about sex, gender and animality.

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661 Burch, *The Principles of Humane Experimental Techinque*. p.17.
662 Lara V. Marks, *Sexual Chemistry: A History of the Contraceptive Pill* (New Haven and London: Yale University Press, 2001). p.43.
663 Sue Bruley, *Women in Britain since 1900* (Hampshire and New York: Palgrave, 1999).p.137.
664 Marks, *Sexual Chemistry: A History of the Contraceptive Pill.* pp.91-92.
665 Ibid. p.100.

As discussed in the previous chapter, a series of philosophical dichotomies that separated nature from culture, man from woman, animal from human and reason from irrationality underpinned mid-twentieth century British science.[666] In turn, these binary opposites, although not consciously presented in medical research, were still imposed upon it, as evidenced by the role post-Cartesian philosophy played in the construction of a science of animal welfare. This post-Cartesianism, as mentioned, retained the old dualisms through the acceptance in biology (medical science) of mechanistic accounts and models of bodies, as well as in the 'hyperseparated'[667] accounts of the human subject from the animal 'active' object in the laboratory. In other words, there was a heightened separation still between the mind and body, and therefore, a persistence of Cartesian philosophy in the material and methodological practices of medical science through its appropriation of mechanism and materialist reductionism, despite its disavowal by certain scientists of the UFAW.

The UFAW presented discourses of animal welfare that hoped to resolve the human/nature dualism by constructing nature, animals and the human within a mechanistic framework and in reductionist and essentialised terms.[668] But the nonhuman within the medical research laboratory still encapsulated these binaries through their use as active objects. The interplay of scientific discourses introduced by the UFAW saw the nonhuman as being the 'Same and Different' from humans – with a tendency to oscillate between the two poles.[669] This treatment and implicit construction of the natural as separate from the cultural also had implications for women of the time. The discourses surrounding a science of animal welfare overlapped with discourses of sex and gender. Women were seen by biological and psychological (psychiatric) science to be more susceptible to neurosis as a result of their gender and their biological disposition to certain illnesses. Most notably, neurosis and stress was thought to be brought on through the monthly occurence of menstruation.

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666 Val Plumwood, *Feminism and the Mastery of Nature* (London: Routledge, 1993).P.43. Also see: Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries*. p.19.
667 Plumwood, *Feminism and the Mastery of Nature*. p.120.
668 Ibid. p.121.
669 Ibid. p.123.

In mid-twentieth century Britain, menstruation became scientifically conceptualised and various psychological and physiological changes in the body associated with it were labelled as 'pre-menstrual syndrome' (PMS). Not only did this occur within the medical field but also the notion of PMS permeated into the cultural milieu and had a huge impact on how people perceived the female body. In particular, PMS and menstruation were tied to notions of the psychological and hence contributed to a form of regulation and control over the female body through the practice of medicine.[670] This regulation over the body helped shaped popular discourses of womanhood and manhood, with various rites of passage associated with each.

It was during the 1950s that research on hormones and the role they play in menstruation became fashionable, especially in relation to the psychological. After the publication of Hans Selye's 1946 paper, scientific theories surrounding the responses of the body during times of trauma directly related to the concept of stress. It was in Selye's 1956 book *The Stress of Life* that he fully articulated the link between stress, women and animals:

> Clinical studies have confirmed the fact that people exposed to stress react very much like experimental animals in all these respects. In women menstruation becomes irregular or stops altogether, and during lactation milk secretion may become insufficient for the baby.[671]

Despite also noting how men's 'sexual urge and sperm count diminished' during times of stress, the emphasis was very much placed on the woman being abnormal. For the rest of the chapter Selye discusses PMS and characterises it as being 'among other things, nervous tension and the desire to find relief in uncustomary, compulsive actions which are difficult to restrain'.[672] He went on to assert that:

> [T]he derangement deserves serious attention because it is frequently accompanied by a number of disturbing mental changes such as: periods of abnormal hunger, general emotional instability, and occasionally, a morbid increase in the sexual drive. It is particularly noteworthy that, according to extensive statistical studies, 79 per cent to 84 per cent of all crimes of violence committed by women occur during, or in the week, before their period.[673]

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[670] Julie-Marie Strange, "'I Believe It to Be a Case Depending on Menstruation': Madness and Menstrual Taboo in British Medical Practice, C. 1840-1930," in *Menstruation: A Cultural History*, ed. Andrew Shail and Gillian Howie (Hampshire: Palgrave Macmillan, 2005). p.103.
[671] Selye, *The Stress of Life*. p.256.
[672] Ibid.
[673] Ibid. p.257.

So, for Selye men could have a sex drive and there was danger of it diminishing during times of stress, but women who showed signs of wanting to have sex were seen as abnormal. It was within the framework of Selye's theory of stress and the body that PMS could be articulated as a mental disorder. Other scientists sought too to investigate the disorder in the 1950s using the language of stress as a theoretical backdrop to their research. For instance, in 1951 a psychiatrist named Joseph Henry Rey made an application for a licence to use animals in an experiment that would assess the role of hormones for the 'treatment of patients suffering from disorders of the menstrual cycle, together with mental illnesses, and to investigate the psycho-physiological mechanisms in such states'.[674] The certificate to perform such experiments was granted on 12 February 1952 by the Under Secretary of State for the Home Office.

The Selyian psychosomatic approach was becoming increasingly popular and used in aspects of psychiatry, particularly in relation to women and mental health. This was where the discourses of women, madness and animality overlapped via the post-Cartesian philosophy of science, which permeated every aspect of medical discourse in mid-twentieth century Britain. After successfully applying for licence, Rey went on to produce several papers about the role of hormones in PMS. This included studies of 'menstrual disorders in psychiatric illness' through experimentation on female psychiatric patients.[675] Here, a clear distinction between normal and abnormal was made. Rey claimed that 'there are certain abnormalities of behaviour and changes in mental state coinciding with certain phases of the [menstrual] cycle',[676] listing depression, a higher incidence of suicides and 'delinquency' during the premenstrual phase.[677] The patients involved in the study were assessed through the taking of daily vaginal smears and urine samples. This was so Rey could analyse the effect of certain hormonal mechanisms on menstrual function and emotional disturbance.[678] The study concluded by claiming that there was a positive relationship between the severity of psychiatric illness and ovarian function.

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674 TNA: Home Office Registered Papers (HO285): HO285/15, Joseph Henry Ray Application for Licence under the Cruelty to Animals Act 1976: Eligibility of a Professor of Psychiatry or Psychological Medicine to Act as a Signatory, 1951.
675 Dr. J. H. Rey, "Discussion on Amenorrhoea and Hirsutism," *Proceedings of the Royal Society of Medicine* 50 (23 January 1957).
676 Ibid. p. 453.
677 Ibid.
678 Ibid. p.453.

Not only were female psychiatric patients implicated in the discourse of hormones and PMS, but so too were nonhumans. Following Rey's report, Dr. B. T. Donovan discussed the relationship between 'psychogenic amenorrhoea',[679] a psychologically induced absence of menstruation. Here Donovan drew on animal studies to highlight the mechanisms underlying 'the condition':

> Destruction of a large area of the hypothalamus [part of the brain] immediately posterior to the optic chiasma sometimes produced a state of constant oestrus in guinea-pigs. Ovulation did not occur and the ovaries contained only large follicles. This result was subsequently confirmed in the rat… Greer (1953) made the observation that progesterone given daily was able to produce ovulation in rats displaying constant oestrus and permit the resumption of oestrous cycles.[680]

The ideas of the psychiatrists who studied menstruation contributed to definitions of femininity and female sexuality in the 1950s. With menstruation's vast and unstable repertoire of physical and emotional symptoms, women had to be controlled, and it was the male doctors and biological scientists who implemented this control over female (and animal) bodies.[681] Women were seen by biological science as natural objects of knowledge, similar to the nonhuman in the lab. As Elizabeth Grosz asserts, 'the female body has been constructed not only as a lack or absence but with more complexity, as a leaking, uncontrollable, seeping liquid; as formless flow…' Women's bodies became 'inscribed [with] a mode of seepage'.[682] Therefore these ideas of menstruation intersected with ideas of the nonhuman – both were seen as natural objects of knowledge to be controlled and regulated. Women, in terms of menstruation and mental health, were diagnosed as abnormal, prescribed treatments, and accordingly construed as 'a conglomeration of attributes to be predicted and controlled along with other natural phenomena'.[683]

The most prominent medical texts about menstruation and PMS came from a woman scientist at the time. It was the work of British psychologist and general practitioner Katharina Dalton which really set the tone for the links between PMS and madness in

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679 Dr. B. T. Donovan, "The Hypothalamus and Gonadotophin Secretion," *Proceedings of the Royal Society of Medicine* 50 (23 January 1957).
680 Ibid. p.454.
681 Showalter, *The Female Malady*. p.129.
682 Elizabeth Grosz, *Volitile Bodies: Towards a Coporeal Feminism* (Bloomington: Indiana University Press: 1994). p.203.
683 Linda Alcoff, "Cultural Feminism Versus Post-Structuralism: The Identity Crisis in Feminist Theory," in *Feminism and Philosophy: Essential Readings in Theory, Reinterpretation, and Application*, ed. Nancy Tuana and Rosemarie Tong (Boulder: Westview, 1995). pp.434-435.

mid-twentieth century Britain.[684] What Dalton did was to construct an argument about the pre-menstrual woman as being centred entirely around the functions of their reproductive organs. She traced a dividing line between normality and abnormality at certain times of the month. Her research focused on the effects PMS had on women's physiology, women's tendency to commit violent crime, their productivity at work and school, and the propensity for more women to be admitted to psychiatric hospitals at the peak of their ovulatory period.[685] In her 1960 *British Medical Journal* paper, she declared:

> The adverse effect of menstruation on the normal school work of 217 menstruating girls, aged 11 to 17 years, is evidenced by the finding that one in every four girls had a fall in weekly mark during the premenstruum followed by a rise after menstruation. It is appreciated that in times of stress the premenstrual symptoms are increased (Dalton, 1955). It would appear, therefore, that on occasions of important examinations the handicap imposed by menstruation will be proportionately increased. About one girl in six in any examination entry will be in her premenstruum and thus at her lowest intellectual ebb. *While zealots campaign assiduously for equality of the sexes, Nature refuses to grant equality even in one sex.*[686]

For Dalton, nature was indeed separate from culture, women and girls were part of nature and were adversely affected by their menstrual cycles, and they were biologically a very different species to that of men. Dalton further explained the links between PMS and physical violence in her popular book of 1964 *The Premenstrual Syndrome* where she suggested that the monthly hormone imbalance and the 'handicap' of menstruation may make the woman deceitful:

> All too often the patient herself is not fully aware of the distress caused by her periodic tantrums and it is the husband or social worker who first stresses the need for treatment. When a women demonstrates bruises as signs of her husband's cruelty it is well to remember the possibility that these may be spontaneous bruises of the premenstruum and it is wise to enquire about the date of her last menstruation.[687]

Katharina Dalton contributed to the medical construction of women as 'something' that

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[684] Zahra Meghani, "Of Sex, Nationalities and Populations: The Construction of Menstruation as a Patho-Physiology," in *Menstruation: A Cultural History*, ed. Andrew Shail and Gillian Howie (Hampshire: Palgrave Macmillan, 2005). p.131.

[685] Raymond Greene and Katharina Dalton, "The Premenstrual Syndrome," *British Medical Journal* 4818 (1953). Katharina Dalton, "Menstruation and Acute Psychiatric Illness," *British Medical Journal* (1959). Katharina Dalton, "Effect of Menstruation on Schoolgirls' Weekly Work," *British Medical Journal* (1960). Katharina Dalton, "Menstruation and Crime," *British Medical Journal* (1961).

[686] Dalton, "Effect of Menstruation on Schoolgirls' Weekly Work." p. 328. [my italics].

[687] Katharina Dalton, *The Premenstrual Syndrome* (London: William Heinemann Medical Books Limited, 1964). p.94.

is natural and abnormal, deceitful and dishonorable.[688] By responding to women's pain and distress in a manner that understood their causes in biologically and hormonally charged ways, this implied the cures of the condition as bringing the body back to a state of normality.[689] And so this form of control over the female body did not necessarily contribute towards women's emancipation but rather subjected it to a mechanistic physiology[690] which related to broader social and cultural understandings of women at the time.

This mechanistic physiology and the conjoined ideas of Selye's stress syndrome were analogous to the British state technocracy, which operated from a notion of functional fit. Mid-twentieth British society was governed through the use of a functionalist model, which emphasized technological imperatives, controlled and directed by scientific experts.[691] Hence human and nonhuman behaviour were explained through the discipline of ethology, and consequently were to be explained in mechanistic terms.[692] As Haraway asserts:

> Human engineering sought to construct a control hierarchy, modeled on the individual organism with the nervous system on top. This organismic model facilitated the conception of society as a harmonious, balanced whole with proper distribution of function. The interrelations of nervous and reproductive systems, the two main integrative mechanisms of the organism, provided a microcosm of life, including social life (superorganism). The principle scientific goal was a biological theory of co-operation based on management hierarchies. What has to be managed were organic life, instinct, sex. At the top of the organism-pyramid was mind, permitting altruism to mitigate the excesses of competition. Psychobiology… was faced with rationalizing altruism in a competitive world – without threatening the basic structure of domination.[693]

What British medical science did was emphasise this functional fit by using nonhumans in medical experiments and by rendering menstruation abnormal and in need of a form of control. Animals and women were natural objects of knowledge that needed to be controlled and managed, even standardized. The sexism and speciesism implicit in mid-twentieth century British science is less in the ideology of sex roles as one based on the

688 Fausto-Sterling, *Myths of Gender: Biological Theories About Women and Men.* p.95.
689 Ibid.
690 Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature.* pp.26-27.
691 Ibid. pp.32-33
692 Ibid. PP26-27. See also: Kirk, "Between the Clinic and the Laboratory: Ethology and Pharmacology in the Work of Michael Robin Alexander Chance, C. 1946-1964."
693 Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature.* p.47.

technocratic logic of human domination over nature.[694] To change the semiotics of animal experimentation into one of scientific welfarism, contributed to the creation of a discourse of care towards the nonhuman which had notions of domination hidden within it. The very representation and language of science was changed to enable more subtle modes of control to be had over 'natural' bodies.

Returning to Carol J. Adam's notion of the 'arrogant eye' of animal experimentation we can see the overlapping representations of the nonhuman and the woman taking shape in mid-twentieth century British medical research and practice.[695] The idea of a subject-object binary is reproduced in the laboratory as well as in defining women from the standpoint of the human male gaze. As Susanne Kappeler points out, 'what distinguishes man from woman is his access to representation, to cultural symbolisation, the power of naming, in which he uses women, along with all the other silent animals, as symbols, as objects for representation'.[696] This symbolisation is most evident in a science that was marked by patriarchal naming devices. One does not have to be a man to participate in the semiotics of medical research, as Katharina Dalton proved. However, the discourses of medicine in the guise of stress and distress were replete with naming devices that created and shaped subject-object statuses for both the animal and the woman.

These naming devices were disciplinary techniques which manifested as power-knowledge relations. Power over both animals and women was regulated through different yet comparable techniques. Both forms of power encapsulated scientific knowledge about the bodies of animals and women. The history of the female body is just as much caught up with the history of the animal body and of course, the male body. This ties to power-knowledge relations which discursively construct bodies through disciplinary techniques pervasive in modern society, in this case, mid-twentieth century Britain. Moreover, the power-knowledge of the discourses of laboratory animal science shows that gendered disciplinary power can be articulated through the very performance of science and its persentation of an objective reality through the paradigm of positivism, wrought by the disciplinary male gaze.

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694 Ibid. p.67.
695 Adams, *Neither Man nor Beast: Feminism and the Defense of Animals*. pp.39-40.
696 Susanne Kappeler, *The Pornography of Representation* (Minneapolis: The University of Minnesota Press, 1986). p.68.

The disciplinary mechanisms applied on living beings were normalised through the creation of regimes of truth and operationalized within institutions such as the state, and science working together in a power-knowledge nexus.[697] This power-knowledge nexus was ultimately a way to create an understanding of nonhumans as objects but also, as has been stated, these disciplinary mechanisms also objectified women and discursively produced the 'feminine body'.[698] Further this can be considered alongside broader cultural constructs of women as also being passive and docile, as evidenced above, as Foucauldian feminist Susan Bartky writes:

> The disciplinary techniques through which the "docile bodies" of women are constructed aim at a regulation that is perpetual and exhaustive – a regulation of the body's size and contours, its appetite, posture, gestures and general comportment in space, and the appearance of each of its visible parts.[699]

Indeed, one only has to compare the disciplinary techniques practiced upon laboratory animals as recommended by the UFAW in their work to recognise how similar these techniques of power were over both the laboratory and animal and the woman. A 1956 family medical compendium entitled *Healthy Minds and Bodies*, by Dr T. Traherne and Frank Preston, further demonstrates the regulation of femininity (microphysics of power) in 1950s Britain with some advice for wives:

> A wife should always be careful to be "sweet" to her husband. She should look, feel and smell as nice as she possibly can. Her hair, her hands and her skin should be kept clean. Most women perspire under their aims and breasts and between their legs. Before going to bed a wife should wash and powder the parts that tend to get hot and sticky during a busy day. [700]

The gaze then, became gendered in mid-twentieth century Britain by becoming embedded within the domain of the masculine. Disciplinary techniques over animals and women ensured that their bodies became standardized and regulated. Although women and animals are clearly distinct beings, their histories are entangled and reinforce each other.

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697 Judith Butler, *Gender Trouble: Feminism and the Subversion of Identity* (New York, USA: Routledge, 1999). Foucault, *Discipline and Punish: The Birth of the Prison*.

698 Sandra Lee Bartky, "Foucault, Femininity, and the Modernisation of Patriarchal Power," in *The Politics of Women's Bodies: Sexuality, Apprearance, and Behaviour*, ed. Rose Weitz (New York and Oxford: Oxford University Press, 1998).p.41. Lois McNay, *Foucault and Feminism* (Cambridge: Polity Press, 1992).p.26.

699 Bartky, "Foucault, Femininity, and the Modernisation of Patriarchal Power." p.41.

700 Dr T Traherne and Frank Preston, *Healthy Minds and Bodies* (London: The Waverley Book Co., LTD., 1956).p.213.

Conclusion

What the UFAW did for nonhuman laboratory animals, Dalton and her colleagues did for women. Overall this was tied to Selyian notions of stress and distress. No longer were animals and women to be seen as inert objects, but rather, through the language of stress, they became individual cyborgian "things" of the world, that could display recalcitrance if not subjected to some measure of control. It was here that the subject-object statuses changed and the nonhuman, alongside the woman, became an active object in the world. The nonhuman was not wholly located in culture, and still a part of nature, but was rendered visible through a scientific gaze that created stress as much as it tried to alleviate it. They were, therefore, still objects, but disobedient ones.

Chapter Six

Animals, Law and Gender: Vivisection Debates and the Review of the 1876 Cruelty to Animals Act, 1947-1965

In July 1963, Sir Sydney Littlewood published a letter in the *British Medical Journal* entitled "Cruelty to Animals Act, 1876". He asked scientific researchers in the British medical profession to provide evidence pertaining to experiments on live animals in light of a forthcoming review of an Act passed by Parliament in 1876. This Act regulated the practice of vivisection and introduced a compulsory licensing system for scientists who wanted to conduct experiments on living animals.[701] He stated that, 'The committee's terms of reference are: to consider the present control over experiments on living animals and to consider whether, and if so what, changes are desirable in the law or its administration'. '[I]f any person has information or comment that will help', he went on to state, 'send it in writing to the …Home Office'.[702] The letter suggested the establishment of an inquiry into the Act's relevance and application to scientific research and development of the time. This request acted as catalyst for a series of debates involving a variety of organisations, such as the Medical Research Council (MRC), The Universities Federation for Animal Welfare (UFAW), The Research Defence Society (RDS), the RSPCA, the British Union for the Abolition of Vivisection (BUAV) and the National Antivivisection Society (NAVS), amongst others.

This final chapter explores the key debates surrounding animal experimentation from 1947 to 1965 when the first post-war review of the Cruelty to Animals Act 1876 took place. As we have seen in the previous two chapters, animals were used in both military and medical experiments, much to the vexation of the anti-vivisection movement. Military experimenters used nonhuman animals for biological and chemical weapons testing, and medical researchers for experiments in relation to investigating psychiatric 'disorders' such as pre-menstrual syndrome. Further to this, we have seen that discourses of animal welfare permeated the medical milieu in the 1950s, utilised by scientists to justify the continued use of animals in their research. It is at this point one can argue that *within* scientific circles at the time there was a bifurcated construction of the nonhuman.

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[701] Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*. P.160.
[702] Sydney Littlewood, 'Cruelty to Animals Act, 1876', No. 5351, Medical Journal, (1963), p. 256.

On the one hand, the nonhuman was seen as an inert object to be used to test dangerous pathogens on; on the other, animals were granted the status of living beings but ones who were still endowed with object status.They became *active objects,* via emergent discourses of animal welfarism.

This chapter analyses the contradictory discourses of the pro-and anti-vivisection movements of the time in order to understand constructions of nonhuman laboratory animals in mid-twentieth century Britain. In assessing the knowledge created by these movements in relation to attendant power apparatuses, this chapter will show how relations of power-knowledge were embedded in intricate socio-political networks, and had consequences for the law relating to vivisection and its practices.

The first section discusses the post-war vivisection debate and addresses the possible precursors of the review of the 1876 Act. The second section discusses the main protagonists of the review of the Littlewood Enquiry's review of the Act, including contributions from Porton Down Chemical and Biological Defence Establishment, the Research Defence Society (RDS), the BUAV and NAVS. Because of the scope of the Inquiry, I am focussing on the debates about animal pain and the Pain Condition enshrined in the Act. Finally, the conclusion brings together the debates on animal pain, the 1876 Act and the Littlewood Inquiry to discuss the discursive practices of law in relation to gender. Drawing on feminist legal theory,[703] I shall argue that the law relating to experimental animals paralleled that of legal discourses about women at the time.

Through the review of the 1876 Act I shall be investigating the epistemological status of the animal body, questioning the origins of knowledge relating to animals and directing attention to the social practices that define the animal body in experimental research.[704] This chapter uses a narrative approach that questions the assumptions of law, its construction of what it sees as 'natural' and instead analyses the discourse of law as an effect of power relations.[705] This means examining whether or not the 'naturalness' of constructing animals as objects is a product of viewing the law as a natural and inevitable

[703] Martha Albertson Fineman and Nancy Sweet Thomadsen, ed., *At the Boundaries of Law: Feminism and Legal Theory* (London and New York: Routledge, 1991).
[704] Judith E. Grbich, "The Body in Legal Theory," in *At the Boundaries of Law: Feminism and Legal Theory*, ed. Martha Albertson Fineman and Nancy Sweet Thomadsen (London and New York: Routledge, 1991). pp.61-62.
[705] Ibid. p.62.

part of contemporary western society, therefore locating the law on experimental animals to be within the confines of legal discourses that are construed as universal masculine traits and of which run parallel to the philosophical assumptions mentioned in the previous chapters about the methodologies of science.[706]

Previous Literature

There is a substantial amount of scholarly literature devoted to nineteenth century vivisection debates and the creation and rise of the anti-vivisection movement in this period.[707] Richard French, Harriet Ritvo, Nicolaas Rupke and Hilda Kean are the most prominent historians to cover the development of the 1876 Cruelty to Animals Act. It is French's book *Antivivisection and Medical Science in Victorian Society* that was the first contribution made towards the understanding of the development of animal experimentation and its opponents in nineteenth century Britain. French details the debates surrounding the formation of the 1876 Act alongside the prominent state and social actors at the time and explores the Act, its consequences and true beneficiaries.[708] Rupke's book *Vivisection in Historical Perspective* follows on from French's work and is a series of collected essays by various authors about the nineteenth century development of vivisection and the social movements that formed to counter it. The book explores the vivisection controversy in Victorian Britain in more detail, and subsequent chapters demonstrate the continuities of such debates to the present day. However, the most prominent chapter in the book is Mary Ann Elston's 'Women and Anti-Vivisection in Victorian England, 1870-1900'. [709] Here, Elston is concerned with exploring the connections between the emergence of the women's movement and antivivisection movement in Victorian Britain. She highlights elements of intersectionality between the movements, for instance, discussing the historical constructions and associations made

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[706] Ibid. p.62.
[707] French, *Antivivisection and Medical Science in Victorian Society*. Ryder, *Victims of Science: The Use of Animals in Research*, Rupke, ed., *Vivisection in Historical Perspective*, Tester, *Animals and Society: The Humanity of Animal Rights*, Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*, Kean, *Animal Rights: Political and Social Change in Britain since 1800*, Turner, *Reckoning with the Beast: Animals, Pain and Humanity in the Victorian Mind*, Bourke, *What It Means to Be Human: Reflections from 1791 to Present*.
[708] French, *Antivivisection and Medical Science in Victorian Society*.
[709] Mary Ann Elston, "Women and Anti-Vivisection in Victorian England, 1870-1900," in *Vivisection in Historical Perpsective*, ed. Nicolaas Rupke (London and New York: Routledge, 1990). pp.259-294.

between women and animals and the conflation of women and the nature.[710] However, I seek to go further than this, and to elucidate the intricate power-knowledge networks that framed the *mid-twentieth* century vivisection debates and how these ran parallel to the broader socio-cultural milieu in relation to gender and women.

A surge of scholarly interest followed these ground-breaking books, led by Kean, Ritvo and Bourke. They, however, were concerned with such issues as the animal rights debates, such as in Kean's book *Animal Rights: Political and Social Change in Britain Since 1800*. Kean analyses animal rights from a historical perspective in relation to contemporary debates about the cultural and social role of the nonhuman.[711] In her article 'The 'Smooth Cool Men of Science': The Feminist and Socialist Response to Vivisection', Kean addresses the broader social and historical context of the time by drawing on the work of Marshall Berman and his concept of modernity.[712] Whilst acknowledging the contradictory nature of Britain's nineteenth century modern period, Kean articulates the very political contradictions that the 1876 Act contained, at once embracing science as an emblem of progress while at the same time the middle classes (particular the incipient feminist and socialist movements) were renouncing its practices.[713]

Another key text, by Ritvo followed on from the work of French and Rupke, and fell in the same vein as Kean. In her book *The Animal Estate: The English and Other Creatures in the Victorian Age* she asks how and why Britain influenced global laws about animal rights and legislation.[714] Ritvo undertakes a broader examination of vivisection debates in the nineteenth century in order to address Britain's influence on a global scale when it comes to animal legislation and law. A more recent study that addresses the vivisection debates of the Victorian age is Joanna Bourke's book *What it Means to Be Human: Reflections from 1791 to Present*. This tackles the nineteenth century vivisection debates and their intersection with debates about slavery and women,[715] and interrogates the assumptions that have saturated scientific discourse throughout the centuries about the links between

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[710] Ibid. p.262.
[711] Kean, *Animal Rights: Political and Social Change in Britain since 1800*.
[712] Hilda Kean, "The 'Smooth Cool Men of Science': The Feminist and Socialist Response to Vivisection," *The History Worshop Journal*, no. 40 (1995). pp.16-38.
[713] Ibid.pp.19-20 & pp.22-26.
[714] Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*. p.160.
[715] Bourke, *What It Means to Be Human: Reflections from 1791 to Present*.

women and animal 'others'.[716] However, whilst Bourke claims that her focus is upon the period running from the eighteenth century to present, when addressing vivisection, its debates, and the laws surrounding it, she does not address mid-twentieth century British science or its precedents.

Following this body of work, I will be drawing on the studies of Ritvo, Kean and Bourke to analyse the narratives of mid-twentieth century vivisection controversies, and to highlight the entanglements of the oppression of nonhumans with that of women. My work in this chapter offers an account of a historical subject that has been neglected: that of the review of the 1876 Cruelty to Animals Act, published in 1965 and entitled the 'Report of the Departmental Committee on Experiments on Animals' (the Littlewood Report).[717] Most histories of vivisection in Britain focuses upon the nineteenth and early twentieth centuries, with the mid-twentieth century being neglected. It is only the work of Dan Lyons that pays any attention to this neglected aspect of the politics of animal experimentation. In his book *The Politics of Animal Experimentation*[718] he devotes a substantial part of one chapter to the Littlewood Enquiry but barely uses any primary sources except the Littlewood Report itself, and hence his work lacks much needed depth and historical context.[719] Nor does he address these debates intersectionally, but rather they form part of his broader linear narrative about the development of animal experimentation law in relation policy networks.[720] His work is heavily theoretical and pursues a deductive research strategy, which is dependent upon the antiquated and masculinist ontological standpoint of critical realism.[721] On the other hand, I have been very much guided by the archival sources used in this chapter. I draw on archives of the BUAV and the RDS, alongside Governmental sources such as the departmental files of the War Office, Cabinet Office and the Home Office.

716 Ibid. pp.67-123.
717 "Report of the Departmental Committee on Experiments on Animals."
718 Dan Lyons, *The Poltics of Animal Experimentation* (Hampshire: Palgrave Macmillan, 2013).
719 Ibid. pp.186-219.
720 Ibid. pp.9-52.
721 Ibid.pp.80-111.

The Emergence of Vivisection and Antivivisection in Nineteenth Century Britain

In the Victorian period, vivisection on nonhuman animals became a widespread and popular practice as a result of the newly emerging discipline of physiology.[722] This was coupled with changing beliefs concerning health, illness and the body, and the shifting practices of British medical scientists and doctors.[723] Influenced by the works of the French physiologists Magendie (1783-1855) and Claude Bernard (1813-1878), British scientists began to emphasise experimentation rather than clinical observation as a way to advance scientific knowledge about the body.[724] Animal experiments soon became the *sin qua non* of experimental medicine and helped to facilitate the institutionalisation and professionalisation of the discipline, which in turn legitimated the role of the scientist, accelerating their professional and social status.[725]

As a response to growing practice of vivisection amongst the medical community, and amid raising concerns for the treatment of animals (particularly amongst the middle and upper classes), in 1824 the Society for the Prevention of Cruelty to Animals (SPCA) was formed.[726] The Society established links with the aristocracy, and in 1840 was granted Royal status by Queen Victoria, becoming the RSPCA of the present day.[727] It is here that we can argue that the birth of the anti-vivisection movement occurred and the RSPCA provided the impetus for its growing politicisation. The majority of its members were women, rising from 50 per cent of the membership in 1850 to 60 per cent in 1900.[728] Indeed, women made up the majority of memberships of the anti-vivisection movements in this period. After the formation of the RSPCA a variety of other movements more specific to the antivivisection cause appeared, most notably in 1875 the Victoria Street Society for the Protection of Animals Liable to Vivisection (VSS) co-founded by Frances Power Cobbe.[729] Cobbe, a feminist, later left the VSS due to its changing emphasis from the complete abolition of vivisection to the restriction of the

[722] Rupke, ed., *Vivisection in Historical Perspective*. p.5.
[723] Ibid. pp.5-6.
[724] Lyons, *The Poltics of Animal Experimentation*. PP116-118, Ryder, *Victims of Science: The Use of Animals in Research*. p. 125.
[725] Rupke, ed., *Vivisection in Historical Perspective*. p. 6, Lyons, *The Poltics of Animal Experimentation*. p. 118.
[726] Ritvo, *The Animal Estate: English and Other Creatures in the Victorian Age*.
[727] Lyons, *The Poltics of Animal Experimentation*.p.117.
[728] Elston, "Women and Anti-Vivisection in Victorian England, 1870-1900." p. 267.
[729] Ibid. p.263.

practice. In 1898 she founded the British Union for the Abolition of Vivisection as a response to the more conservative views of the VSS.[730]

In nineteenth century Britain, the first-wave feminist and antivivisection movements coalesced and shared similar concerns. The emergence of the discipline of physiology provided a powerful counter-ideology of the body (both in terms of the animal and the female) to quell the demand for both the rights of animals and women.[731] Sex roles and the social organisation of society were focuses of medical research in this period, with physiologists tying appropriate gender roles to their descriptions of physiological difference. [732] Hence, women were described and depicted as 'natural' objects of knowledge and linked overtly to animals.[733] Women and animals were intimately linked through the discursive strategies promulgated by physiology. Women (who were incidentally becoming more visible in social life) and the concerns raised about vivisection, threatened to disrupt the social order and the growing status of science.[734] What was needed was a form of legislation to counter the accusations of the anti-vivisectionists and help establish science and its practices as the enlightened and rational paternal carer of the social order.

The 1876 Cruelty to Animals Act

As stated in the introduction of this thesis, the 1876 Cruelty to Animals Act regulated the practice of vivisection on nonhuman animals. In order to formulate and enact this piece of legislation, a Royal Commission on vivisection was set up in 1875.[735] The Home Secretary Richard Cross appointed a variety of people from different political, scientific and lay backgrounds to help contribute to the writing of the Act.[736] However, with the growing power of the medical profession and the elevation of the status of science in British society, the Bill was eventually amended to appease medical scientists and doctors.[737] In the end, the Cruelty to Animals Act of 1876 was substantially watered

730 Ibid.
731 Ibid. p. 260.And, Bourke, *What It Means to Be Human: Reflections from 1791 to Present*. p.94-97.
732 Harding, *The Science Question in Feminism*.
733 Bourke, *What It Means to Be Human: Reflections from 1791 to Present*. pp.94-97.
734 Harding, *The Science Question in Feminism*.p.115.
735 Lyons, *The Poltics of Animal Experimentation*. p.128.
736 French, *Antivivisection and Medical Science in Victorian Society*. p.92.
737 Lyons, *The Poltics of Animal Experimentation*. p.133-134.

down in order to ensure that animal experimentation could continue.[738] Yet at this particular time, the medical profession had distant ties with the Home Secretary who approved the granting of licences under the Act, and in the period of time between 1876-1881, only 15% of licence applications were rejected.[739] In 1881-2, the Association for the Advancement of Medical Research (AAMR) - a pro-animal research lobby group - was established, dedicated to pressurising the Government about the Act during which it emphasised its expertise whilst at the same time claiming that they and not the Home Secretary should be responsible for the issuance of licences.[740] The AAMR thus became an advisory body to the Government and formed close ties with the Home Office, meaning that experiments on animals increased from 277 in 1876 following the passage of the Act, to 800 in 1885.[741]

The early part of the twentieth century saw a second Royal Commission and review of the Act, during the period 1906-12. The rise in the status of the medical profession had significantly increased by this point and in 1908 the AAMR formed a public relations body called the Research Defence Society (RDS). The aims of the RDS were to advise the public, scientists and Home Office on the granting of licences and to protect the interests of the licensees, liaise with Parliament, and publishing pro-vivisection literature on the importance of animal experimentation to both medical personnel and the public.[742] Consequently, during the second Royal Commission, the AAMR and its sub-society the RDS overcame any objections to the contemporary usage of the Act. This, coupled with their claims of expertise and knowledge, conferred upon them scientific hegemony over the inquiry and no changes were made to the Act. Only recommendations regarding the 'pain condition' and the establishment of a Home Office advisory committee on the administration of the Act were suggested as a way to improve the Act.[743]

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738 The watering down of the Act, reflected a broader culture of streamlining Acts in the nineteenth century. For instance, animal protection laws from 1805 until 1911 (Erskine's Bill and Martin's Act), went through parliamnent several times before they were passed as legal commitments.

739 French, *Antivivisection and Medical Science in Victorian Society*. p.136.

740 Dan Lyons, "Protecting Animals Versus the Pursuit of Knowledge: The Evolution of the British Animal Research Policy Process," *Society and Animals* 19 (2011). pp.3-4

741 Ibid. p.3.

742 Ibid, p. 2.

743 Lyons, "Protecting Animals Versus the Pursuit of Knowledge: The Evolution of the British Animal Research Policy Process." p.4. And see: Ryder, *Victims of Science: The Use of Animals in Research*. p.136-137.

In the end, the 1876 Act can be summarised as a way to regulate the practice of vivisection. It required that 'no experiment calculated to give pain shall be performed on a vertebrate animal'. Only experiments that were thought to be for 'the advancement by new discovery of physiological knowledge or of knowledge which will be useful for saving or prolonging life or alleviating suffering' could be conducted.[744] As we shall see, the concept and definition of pain and advancement of knowledge was a highly contested terrain in mid-twentieth century Britain. The stipulations of the Act and its idea of painless experimentation meant that premises had to be registered with the Office, and were liable to inspection by appointed Home Office inspectors. The experimenters themselves had to be licensed and had to apply for a certain certificate when conducting a particular experiment. The licence was granted by the Secretary of State, had to be signed by a sponsor, usually a President of a Society such as the Royal College of Surgeons, and lasted for a fixed period of time, which then had to be held by the researchers prior to applying for a specific certificate. Certificates were divided into 'codes' and experimenters applied for the appropriate certificate depending on the severity of the experiment.[745]

The Act had a huge impact on scientific research using animals but it was not until after the First World War that vivisection in Britain increased significantly. The antivivisection movements' supporters became silent observers to the practice of animal experimentation, as public support seemed to grow in favour of it.[746] Between 1920 and 1940 licensed animal experiments increased from seventy-thousand to approximately one million. During these years, the antivivisection societies turning to more visible concerns of animal welfare such as the welfare of cats and dogs in the home, to the detriment of their campaigns against institutions.[747] Some authors argue that the immediate post-war years were a period of invisibility for the antivivisection movement in Britain, and no serious challenge was made towards the abolition of animal experimentation.[748] Richard Ryder, an eminent animal rights scholar and originator of the concept "speciesism", claims that due to the mental distress of the First World War, the antivivisection movement stagnated. Ryder claims this is because survivors of the war 'turned their attention to the welfare of their own species', with the animal welfare movements,

[744] "Report of the Departmental Committee on Experiments on Animals." p. 27.
[745] Ibid.pp.32-39. See introduction for details.
[746] Ryder, *Victims of Science: The Use of Animals in Research*. Ibid. p.163.
[747] Ibid. p.163.
[748] Ibid. p.142-145.

'dominated by middle class women', failing to achieve as much public support as they used to. Incidentally, he claims, because of the tragedies of the War, the movement appeared 'faintly ridiculous… and it seemed that the period from the mid-1920s until the 1960s represents a gap in the progress of the movement'.[749]

According to Ryder, nothing of particular note happened in the 1950s and 1960s concerning the animal welfare movements, apart from the efforts of a few 'middle class women'. However, as we shall see, calls for a third Royal Commission on Vivisection and a review of the 1876 Act provided the impetus for the revival of the antivivisection and animal rights movements. Articles and letters critical of vivisection appeared in the columns of the daily newspapers between the period 1947-1965, and scientific societies began to convene public lecture specifically focussed on animal experimentation. Scientists came under increasing public scrutiny regarding their experiments (nuclear warfare experiments, biological and chemical weapons experiments were reported in the press – see chapter one). In response, the UFAW promulgated a welfare perspective towards the treatment of nonhuman animals under experiment and published a wide array of documents to substantiate this approach (see chapter five). It could be argued that science's hegemony was under threat in a post-war period and hence, the battle regarding animal experimentation was far from 'stagnant' in this period.

This 'Monstrous Pretence': Vivisection and the Call for A Third Royal Commission

Funding for scientific research in the military and medical spheres grew exponentially in the post-war years. With that in mind, as we saw in the previous chapters the nonhuman body was seen as a parsable object through the creation of a discourse of lines.[750] Further, the nonhuman body became a body that could suffer from physiological responses to stress and hence, they became acknowledged as being recalcitrant beings, yet still objects of manipulation. Thanks to Hans Selye and the appropriation of his theories by the UFAW, this endowed nonhuman experimental animals with *active object* status: docile bodied, but living beings. Science in post-war Britain was a contradictory maelstrom of ideas that construed the nonhuman in many varied and opposing ways. It

[749] Ibid. p. 142.
[750] Johnson, *Power, Knowledge, Animals*. pp.56-62.

was here, then, that it was pertinent to discuss animal experimentation law. The law gave scientists permission to use animals in their experiments and deflect any unwanted attention away from them by having recourse to seek its protection. And so, within the discourse of law, the term animal is given both property and welfare status; they thus became objects of knowledge that needed to be cared for appropriately.[751] Any counter-discourse offered in response to lawful language is often deemed unsuitable. It is here that this section discusses the subjugated discourses of the anti-vivisection and animal welfare societies in the immediate post-war period and their renewed interest in pressurising contemporary governments to review the Act of 1876. As we shall see, not all of the societies representing the interests of anti-vivisectionists were successful.

We begin our story on 23 February 1948 in the office of the Home Secretary, James Chuter Ede, where a Deputation of anti-vivisection societies has cooperated to argue for a review of the 1876 Act.[752]Those present included; The Dowager Duchess of Hamilton, chairman (*sic*) of the Animal Defence and Anti-vivisection Society, Miss Lind-af-Hageby, president of the Society, Dr Fielding-Ould, Director of the National Antivivisection Society, and Mr Wilfred Tyldesley, Secretary of the British Union for the Abolition of Vivisection, Dr Fergie-Woods President of the London and Provincial Anti-vivisection Society, Dr Bertrand Allison Honorary Treasurer London and Provincial Anti-Vivisection Society, The Reverend Richard Lee, Chairman of the BUAV, and Mr Rodenhurst, Secretary of the Conference of Anti-Vivisection Societies.[753]

The main argument advanced by the Deputation was that the Act had failed to protect animals from pain and suffering and that, in light of contemporary advances in human health and medicine, vivisection had 'become obsolete'.[754] Each representative of the Deputation read a statement to the Home Secretary indicating why this was so. Generally speaking, the primary theme of this meeting was that there had been vast improvements in public health due to the provision of better housing, sanitation and food, and therefore animal experiments were unnecessary. Furthermore, the Deputation claimed that the Act failed to safeguard animals given the immense increase in the number of

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751 Ibid.p.41.
752 TNA, HO45/25857, Note of A Deputation from the Anti-Vivisection Societies Received at the Home Office on 23rd February 1948, 1948. P.1.
753 ibid. p.1.
754 ibid. p.47. And see, TNA, HO45/25867, Antivivisection Deputation to the Home Secretary, Animals Defender Magazine, 1948. P.47

experiments and thus, the Home Secretary had failed to prevent the infliction of unnecessary pain and suffering in animals. It was felt that 'the time was therefore, ripe, for a full investigation'.[755]

This Deputation made comparisons between vivisection and the tortures people suffered during the Second World War at the hands of the Nazis. It was the Duchess of Hamilton who was the first to make such a statement, and claimed:

> It is notorious that experiments on animals lead to experiments on human beings, of which the horrible experiments carried out by German Doctors on helpless victims in the concentration camps are the worst examples. Moral sensibilities are easily blunted by cruel practices. Antivivisection seeks to save humanity from moral contamination and physical degeneration. It is a movement for the protection of humanity as well as one for the liberation of animals from the infliction of unjustifiable pain and suffering.[756]

This emotive speech by the Duchess, made reference to recent atrocities in Germany and consequently hoped convey to the Home Secretary that vivisection was a question of moral responsibility, for the good of humanity and for the good of the nation. The Duchess also protested on behalf of the 'taxpayers of this country' who were 'forced to share in the continuation of cruel and unjustifiable experiments on living animals'[757] She noted that in the past year there had been seven instances of breaches of the Act in relation to the pain condition.[758] The Duchess ended her speech by calling for a third Royal Commission into the workings of the Act in the interests of the public.[759]

Another member of the Deputation, Miss Louise Lind-af-Hageby (1878-1963), echoed this statement by the Duchess. Lind-af-Hageby was a prominent figure in the antivivisection movement in the late nineteenth and early twentieth centuries, and was an ally of Frances Power Cobbe. The granddaughter of the Chamberlain to the King of Sweden, she trained in France, and then studied again in England. She claimed to have borne witness to the practice of vivisection during her training and this immediately

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755 Ibid. p.2. And see; p.1. TNA, HO45/25867, Note of a Deputation from the Anti-Vivisection Societies Received at the Home Office on 23rd February 1948, 1948. P.2; TNA, HO45/25867, Anti-Vivisection Societies' Request For Another Royal Commission to Inquire into the Workings of Present Day Vivisection, 1948. P.1.

756 TNA, HO45/25867, Anti-Vivisection Deputation to Home Secretary, Statement by the Duchess of Hamilton, 1948.

757 Ibid. p.1.

758 Ibid. pp.1-4.

759 Ibid. p.6.

politicised her.[760] As a trained scientist she advocated the practice of social medicine and criticised the antivivisectionists' tendencies to appeal to the emotions.[761] In 1906 she formed the Anti-Vivisection and Animal Defence Society and she represented this group at the Deputation. Despite her misgivings about appealing to emotion in order to abolish animal experimentation, her speech to the Home Secretary was laden with emotive rhetoric, and echoed the Duchess' call for morality:

> [T]he cause of humanity to animals is a vital part of civilisation and social development. The Society [Antivivisection and Animal Defence Society] regards all cruelty as an evil which is socially disruptive and degrading to the perpetrators and it cannot accept the plea of "utility" as an excuse. The plea of utility or necessity was raised in defence of slavery and many systematised forms of exploitation of the weak and helpless. Social evolution, the development of sympathy has created a sense of responsibility extending to animal creation of which laws for their protection from cruelty are the outer expression… The laws for the protection of animals are as yet incomplete: they are nevertheless testimony to moral principles fairly generally accepted.[762]

Hageby objected to the 'hideous cruelty inflicted' by the 'vast and ingenious system of modern experimentation on animals'[763], which made 'a mockery of laws for the protection of animals'.[764] Dr Field-Ould and Dr Beddow-Bayly further elaborated upon the social determinants of health. Wilfred Tyldesly additionally noted how: 'this nation will never be healthy while vivisection is permitted to uphold the monstrous pretence'.[765] Yet, despite the abolitionists seeking understanding from the Home Secretary, they were ultimately denied a review of the Act. Chuter Ede, in a letter to Ronald Chamberlain Esq, M.P. on 9 June 1948, stated that there was 'no sufficient case' with respect to the law or its administration to 'justify [him] in recommending the appointment of a fresh Royal Commission'.[766]

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760 Kean, "The 'Smooth Cool Men of Science': The Feminist and Socialist Response to Vivisection." p.22 & p.26.
761 Ibid. p. 22.
762 TNA, HO45/25867 Antivivisection Deputation to the Home Office: Speech by Miss Lind-Af-Hageby, 23 Feb. 1948. P.1.
763 Ibid. p.1
764 Ibid. p.1.
765 TNA, HO45/25867, Antivivisection Deputation speech by Wilfred Tyldesly, 23 Feb 1948. pp.2-3.
766 TNA, HO45/25867, Letter Addressed to Chamberlain from Home Secretary Chuter Ede, 9 June 1948. p.1.

The question arises as to *why* Chuter Ede refused another inquiry into the Act. As well as the obvious reasons related to the broader social, political and economic climate at the time, another possibility relates directly to the funding of civil science, animal experiments and the increasing presence of the UFAW in elite circles. Chapter four outlined the research conducted by the UFAW in relation to animal stress. However, could one tentatively suggest a connection between Ede's repudiation of the antivivisectionists' request for an inquiry into the workings of animal experimentation legislation and the UFAW?

On the evening of Sunday 22 February 1948, a mere few hours before the antivivisection delegation met with the Home Secretary, BBC radio's Home Service broadcast their 'Week's Good Cause'. The 'good cause' of the week was the UFAW, and its appeal was read by its Chairman, Major C. W. Hume.[767] The National Antivivisection Society's (NAVS) magazine, *The Animals Defender*, did not discuss this public intervention of an organisation seemingly more favoured by the establishment than theirs until April of that year.[768] The Society claimed to have been inundated with enquires 'almost immediately [after the broadcast]…from our members as to whether this was a cause sufficiently good to merit financial support'.[769] The article initially seemed to praise the UFAW, encouraging its members to wholeheartedly support the organisation as it 'does a considerable amount of invaluable work – notably in connection with rabbit catching and humane killing etc.'.[770]

But what about the NAV's *cause célèbre,* animal experimentation? Where did it stand in relation to the views advanced by the UFAW? Despite the Society's positive views towards the UFAW's 'university connections with scientists of various types, and with physiological investigators', which consequently gave them the ability to 'exert on the vivisectors some degree of moral suasion',[771] it was here that 'dubiety [began] to obtrude'

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767 BBC Home Service Basic, *Week's Good Cause* (1948 [cited 25/02/16 2016]); available from http://genome.ch.bbc.co.uk/17557cd56f204b7a9b52da58e5ed304e. and see: TNA, HO45/25867, Animals Defender Magazine, issued by NAVS, 1948. P.51.
768 TNA, HO45/25867, Animals Defender Magazine, issued by NAVS, 1948. p.51
769 Ibid. p.51.
770 Ibid. p.51.
771 Ibid. p.51.

and the NAVS and UFAW were clearly not complementary organisations. As we saw in chapter four, the UFAW took a welfarist approach to the care and treatment of laboratory animals, and were not opposed to animal experiments. Rather, the UFAW sought to make sure that 'everything possible should be done… to ensure the maximum comfort and consideration, inside the laboratory, for the animals concerned'. Thus, the NAVs were not particularly pleased to have the UFAW receive such a public airing of its views, and the article sought to dissuade their supporters from being misled by the organization, and to reiterate their abolitionist approach to the practice of vivisection by claiming that the Act was 'delusive' and that 'the majority of vivisectors will consider themselves entitled to go to the limits of what the Act sanctions'. Hence, the UFAW used methods of 'peaceful persuasion' that ultimately 'achieve[d] little in a few cases'.[772]

As mentioned above, requests for an enquiry into the workings of the 1876 Act were denied in June and August of that year. The UFAW made their broadcast debut the night before the Deputation to the Home Secretary. Would it be reasonable to assume that this was a tactical move by the organisation, one that was ultimately successful, in dissuading the Home Secretary to accept the arguments put forth by the Antivivisectionists? Conjecture aside, who knows? But one thing is certain: that the rise, *and rise* of the UFAW in the 1950s served to suppress the protests of abolitionists in this period.

The Vivisectors Call for a Review

The BBC's endorsement of the UFAW occurred just in time to deflect any attention away from the rhetoric of the antivivisectionists. It was not long before the world-renowned medical periodical, the *British Medical Journal*, was publishing letters and articles also calling for a review of the 1876 Act. However, this time, these came from the medical profession, and featured a special added extra – animal welfare. On 2 July 1949, an article entitled 'Laboratory Animals' appeared in the journal, almost a year after the antivivisection delegation were refused an enquiry by the Home Secretary. The article discussed the publication of the UFAW *Handbook* (see chapter four) and establishment of the Laboratory Animals Bureau by the Medical Research Council.[773] More importantly, the article talked about the necessity of law when it came to vivisection, arguing that

[772] Ibid. P.51.
[773] "Laboratory Animals," *British Medical Journal* 2, no. 4617 (1949).p.26.

> The vast majority of laboratory workers using living animals under licence and appropriate certificates regard the Act as an invaluable protection… They would no more support the complete absence of Government control in these matters, which would leave their flanks completely exposed to the not always too scrupulous attacks of antivivisectionists… In this matter it would seem that our own law also might benefit from scrutiny and possible amendment.[774]

The article proceeded to consider the 'pain condition' enshrined in the Act, remarking that 'surely it would not defy the wit of parliamentary draughtsmen so to reword the Act' so as to spare the Home Secretary 'possible embarrassment in this matter'.[775] Under the current law, it continued, thousands of 'painless injections and feeding experiments' were deemed inappropriate according to law. The article concluded with a call for solidarity between the UFAW and the Research Defence Society (RDS):

> We believe that most members of the UFAW and all members of the Research Defence Society would find common ground for constructive improvement at almost every point where the present law is a survival of vestigial precautions rather than true and "humane" expression of modern requirements.[776]

The UFAW were becoming ensconced and validated by those scientists in the medical arena who had status, power and political positioning. Another article appeared a week later, on 9 July 1949, entitled 'Care and Treatment of Laboratory Animals'. This article made reference to the UFAW's technical secretary Dr Jean Vinter, who advocated a form of animal welfare in the laboratory which took shape through the 'good will of the experimenter and his technical assistants', a 'sound knowledge' of animal care, and finally, the 'control imposed by law'.[777] It was this final element that the article focused on primarily, calling for a 'new model law' that would be based on a 'schedule of degrees of suffering, rather than on favoured animals, since there was no evidence that rats or mice suffered pain any less than cats or dogs'.[778] The article also suggested that:

> There should also be a qualified veterinary adviser attached to the Home Office Inspectorate, who could be consulted about the breeding and supply of laboratory animals, their care and maintenance, the choice of anaesthesia etc. It was worth studying the UFAW handbook and keeping in mind such points as these: needles should be really sharp; animals should have adequate space for exercise; most animals in captivity required water to drink; the best methods of anaesthesia should be known and practiced; and there should be some care and

774 Ibid. p.26.
775 Ibid.
776 Ibid.
777 "Care and Treatment of Laboraotory Animals," *British Medical Journal* 2, no. 4618 (1949). p.73.
778 Ibid. p.73.

> forethought given to the planning of animal as to the planning of test tube experiments.[779]

Science and sentiment were calling for a review of the 1876 Act, except this time both sides had morality on their side. One issued a moral call for the inalienable rights of all sentient beings; the other emphasised welfare, but more importantly, power.

'These Perverse Zoophilists': The Research Defence Society's Public Lectures

Following the dramatic Labour Party victory in 1945, a 'welfare state' was established, with access to free healthcare, education and housing for all regardless of social class and income. Despite the 1950s witnessing a change in government, from Labour to Conservative, the welfare state survived intact, but, was accorded a lower priority compared to defence.[780] The Conservative government, despite the post-war consensus, saw the welfare state as an impediment to economic growth.[781] As will be recalled, defence expenditure had significantly increased in 1950-1951 because of the outbreak of the Korean War, the threat of the Cold War and Britain's investment into weapons of mass destruction. In spite of this, the notion of the state as being a paternal carer was emblematic of the era, which was marked by a 'conservative modernity'.[782] This form of governance, although meeting the welfare needs of its population, still embraced a paternalistic system of modernisation, by still viewing society as having a natural and inevitable hierarchal social structure.[783] One could argue that this patrician style of government filtered into the methodologies of science, most notably the idea of animal welfare postulated by the UFAW in relation to experimental science.

During this time, the UFAW made many significant alliances with the medical authorities, most notably forming links with the MRC and RDS. It was these organisations whose members were bestowed with Knighthoods and Lordships. More significant members of the RDS in this period included Sir Henry Dale, 1936 Noble Prize Winner, physiologist and pharmacologist, and The Rt. Hon. Lord Cohen of Birkenhead, physician and President of the British Medical Association, General Medical

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779 Ibid.
780 Lawrence, "Paternalism, Class and the British Path to Modernity." p. 161.
781 Rodney Lowe, *The Welfare State in Britain since 1945*, 3rd ed. (Basingstoke & New York: Palgrave Macmillan, 2005). p.80.
782 Lawrence, "Paternalism, Class and the British Path to Modernity." pp.162-163.
783 Ibid.p.163.

Council and the Royal Society of Medicine. These two highly influential men were often mentioned in speeches in the House of Lords, whether it was to substantiate a point made about animal slaughter, or on debates about science and society.[784]

Access to powerful networks within government was essential for both the UFAW and the RDS. It was not long before the RDS, in public speeches, co-opted the rhetoric of the UFAW to convince the general public of the benefit of animal experimentation for medicine, and the safety, welfare and health of the animals used in experiments. This promulgation of pro-animal experimentation ideology was particularly evident in the 1950s, emanating from Sir Henry Dale and Lord Cohen of Birkenhead in their public speeches for the RDS. In the 1955 Paget Memorial Lecture entitled 'Humanity's Rising Debt to Medical Research', Sir Henry Dale gave an impassioned speech about the benefits of animal experimentation for the development and progression of medical science.[785] Dale claimed that the antivivisectionist approach to the idea of animal experimentation was without any 'logical consistency' despite their 'sincere effort' to be rational in their arguments. This was coupled with their:

> 'Imaginative sympathies [which] lead them to reject medical science altogether, and to exclude all animal products from their food or clothing; though even such peculiar people as these must be prepared I think, to answer the charge of cruelty by omission, when they refuse the chance survival, or of the relief of pain, which medical aid could offer to children and others for whose care they are responsible'[786]

The speech therefore reversed the charge of cruelty usually directed towards scientists onto the antivivisectionists. Dale's speech appropriated the rhetoric of the antivivisectionists in order to accuse those animal defenders as having 'so completely lost all sense of balance in their imaginative sympathies, that their concern for the assumed possibility of pain in a few guinea-pigs and mice has involved them in actions which have had, as a direct result, real and hideous suffering and death to members of their own species'.[787] Dale labelled antivivisectionists 'perverse zoophilists'[788] due to their readiness to sympathise more with 'the assumed sufferings of the lower animals' than the

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784 For example see Historic Hansard: *Slaughter of Animals Bill [Hl] Deb 03 December 1962 Vol 245 Cc27-64*.

785 TNA: Cabinet Office Registered Papers (CAB124): CAB124/1638, Paget Memorial Lecture by Sir Henry Dale 'Humanity's Rising Debt to Medical Research', 1955.

786 Ibid. p.3.

787 Ibid. pp.6-7.

788 Ibid. p.8.

'unquestionable sufferings of their fellow human beings'.[789] Dale thus accused the antivivisectionists of a 'cruelty which is none the less detestable because it originates in blind and self-indulgent emotion'.[790]

Dale went on to consider Dr Lane-Petter of the Laboratory Animals Bureau (L.A.B.).[791] This organisation sought to standardise animals used for experimentation through strictly controlled breeding programmes that resulted in genetically similar strains of animals to be used by scientists.[792] Lane-Petter, in the publications of the L.A.B., emphasised the welfarist approach to the keeping and breeding of laboratory animals, in a manner not dissimilar to the UFAW *Handbook on the Care and Management of Laboratory Animals*.[793] In order for prospective breeders of laboratory animals to be accredited by a Government regulatory authority, they had to ensure that the housing, feeding and health of the animals were all of a "high" standard.[794] All of these considerations were linked to the recommendations given by the UFAW. Lane-Petter was emphasising the welfare of the animals, and also linked this to the welfare of the human population: human wellbeing was connected to nonhuman wellbeing in the laboratory.[795]

Lane-Petter was recruited by the UFAW to collaborate on the second edition of the *Handbook*, and was not only the Director of the L.A.B., but also Honorary Secretary of the RDS.[796] Dale's praise of Dr Lane-Petter and the L.A.B in his speech emphasised the growing influence of the scientific welfarist approach to the nonhuman under experiment:

> [T]he Bureau has the general object of making information available about accredited sources of healthy animals, suitable for the various purposes of research, and also about the kinds of accommodation and treatment that have

789 Ibid. p.8.
790 Ibid. pp.8-9.
791 Ibid. p.16 Also see chapter two and Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968."
792 TNA: Cabinet Office Registered Papers (CAB124): CAB124/1638, Paget Memorial Lecture by Sir Henry Dale 'Humanity's Rising Debt to Medical Research', 1955
793 Kirk, "A Brave New Animal for a Brave New World: The British Laboratory Animals Bureau and the Constitution of International Standards of Laboratory Animal Protection and Use, Circa 1947-1968." pp.7-8. TNA: Cabinet Office Registered Papers (CAB124): CAB124/1638, Paget Memorial Lecture by Sir Henry Dale 'Humanity's Rising Debt to Medical Research', 1955
794 Ibid. p.6.
795 Ibid. p.7.
796 Major C. W. Hume, *Man and Beast* (London: Universities Federation for Animal Welfare, 1962). p.65.

> been necessary by experience to keep them healthy under laboratory conditions. The objects of the Bureau are entirely congenial to, and to some extent indeed overlap, with those of this Society'.[797]

Sir Henry Dale and the RDS were adopting the rhetoric of the UFAW in the hope of countering the 'ignorance and muddleheadedness' of the antivivisectionists.[798] Also proving that the two organisations were in ideological alignment and collaboration.

More Pressure to Review the Act

In the late 1950s and early 1960s, there was renewed effort from the abolitionist and welfare camps to put pressure on the government to address the legislation. This emanated from a newly formed organisation, the Lawson Tait Memorial Trust and the RSPCA's Deputation. Created by an amalgamation of organisations including the NAVS and BUAV, the Lawson Tait Trust aimed to fund alternatives in research to experiments on animals.[799] Founded in 1961 as the Humane Research Trust, it was re-named in 1962.[800] Lady Muriel Dowding, wife of Air Chief Marshall of Battle of Britain fame, Lord Dowding, led the Trust. The Dowdings were staunch antivivisectionists, vegetarians and spiritualists. Lord Dowding often spoke in the House of Lords regarding ending vivisection, most notably in 1957. The Government had previously rejected anti-vivisection requests from organisations such as the BUAV and NAVs, but in 1957 the government promised to keep the matter under review. This may have been because of Lord Dowding speech, but also, the growing influence of the UFAW's discourses of welfare within the scientific milieu, and scientists' public call for an assessment of the workings of the Act. Moreover, the changing political context towards the end of the 1950s, with a general election looming, government might have wanted to appeal to the electorate by displaying some degree of interest in the Act.

In 1961, it was reported that 3.7 million experiments were conducted on animals in

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797 TNA: CAB124/1638, Paget Memorial Lecture by Sir Henry Dale 'Humanity's Rising Debt to Medical Research', 1955. p.16
798 p.17.
799 Pamela Brown, "Animal Research: The Progressing Change in Attitude," *Project Appraisal* 5, no. 3 (1990).
800 Ibid. p. 189.

Britain, with 3.45 million permitted without anaesthetic.[801] The establishment of the Lawson Tail Memorial Trust might have been a response to these figures. MP Elizabeth Braddock, during a meeting in the Commons asked the Parliamentary Secretary for Science MR Denzil Freeth if he was aware of the Trust[802] and after an affirmative answer, stated:

> Is the Parliamentary Secretary aware that there is so much resentment about the rise to 3,750,000 in experiments on living animals that any opportunity or attempt to find alternatives ought to have the fullest financial support of the Government? Would the hon. Gentleman be prepared to meet a deputation in order to discuss ways and means to deal with this situation from a financial point of view?[803]

And so the Secretary did meet with the Trust. On 25 January 1962 at Richmond Terrace in London, the Mr Freeth, Dr Joan Faulkner for the MRC and the Trust's deputation including Lady Muriel Dowding, Mr Harvey Metcalfe and Mr Wilfred Risdon convened a meeting about the Act.[804] However, Mr Freeth did not meet the deputation without first having a briefing meeting with Dr Lane Petter, head of the aforementioned L.A.C.,[805] Mr Burley, assistant secretary to the Home Office and Mr Hallett, Office of the Minster for Science.[806] During the briefing meeting, the MRC stressed to Mr Freeth the necessity of animal experiments, and asserted that the 1876 Act ensured that 'no experiment calculated to cause pain may be performed on a living animal, unless the person performing it has obtained a licence from the Home Secretary.'[807] With this, the MRC had already shaped Mr Freeth's opinions prior to his meeting with the Deputation. So much so, in fact, that during the meeting, he claimed that the licencing of animal experiments was a matter for the Home Office, and so was not able to comment on it when asked by the Deputation.[808] The meeting concluded with little progress for the antivivisectionists: all the Parliamentary Secretary had offered was an assurance that 'no unnecessary use was made of animals for experiments and that steps were always taken

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801 TNA, CAB124/1638, Confidential Document by MRC in Response to Representations by the RSPCA, 1962. p.3
802 Historic Hansard HC Deb 05 December 1961 vol 650 cc1114-5.
803 Ibid.
804 TNA, CAB124/1638, Note of a Meeting at 2 Richmond Terrace, 25 January 1962
805 The Laboratory Animals Bureau became The Laboratory Animals Centre (LAC) in…
806 TNA, CAB124/1638, Deputation from the Lawson Tait Memorial Trustees briefing meeting at 10.30am in Parliamentary Secretary's Room, 25 Jan, 1962.
807 TNA, CAB124/1638, The Cruelty to Animals Act, Memo from MRC to Parliamentary Secretary for Deputation Meeting with Lawson Tait Memorial Trust, 1962
808 TNA, CAB124/1638, Note of a Meeting at 2 Richmond Terrace, 25 January, 1962. p.2.

to minimise any animal suffering'.[809] The scientists were still winning, but what would follow would eventually prompt a review of the Act.

The RSPCA Deputation and the Beginnings of a Review

'Quis custodiet ipsos custodies?' [810] asked R.F. Rattray, the Vice-Chairman of the R.S.P.C.A. in a letter to the British Medical Journal in 1962 about the failings of the Cruelty to Animals Act 1876. In his letter, Rattray claimed that the inspectors under the Act, despite an increase in their number from 'two to now six', still allowed scientists to conduct painful experiments on animals because the inspectors, all 'medical men without any veterinary qualification', were weighed down by bureaucracy and frequently painful experiments, contra the pain condition, were mistaken for ones that abided by the law.[811] Rattray also drew on the welfarist rhetoric of the UFAW and quoted a series of passages from *The Principles of Humane Experimental Technique,* in relation to the humanity of current experimental methods on animals. Rattray's letter was indicative of the growing prowess of the UFAW in many different circles. Not only that, the RSPCA, a more conservative organisation not opposed to vivisection, had in 1962 requested a deputation with the Home Secretary about the 1876 Act. This deputation from the RSPCA was separate from and initially unknown to the abolitionist anti-vivisection organisations such as the BUAV. In their *Branches Newsletter* in 1962, the BUAV claimed they had 'discovered, quite by accident' that the RSPCA 'had written to the Home Secretary on the matter' of the law in relation to experiments on animals.[812] The BUAV declared that despite offering solidarity the RSPCA nevertheless 'stuck to their decision not to cooperate' with them.

This decision of the RSPCA not to cooperate nor align themselves with the abolitionist antivivisection societies was clearly indicated in a letter sent by the organisation to the Rt Hon Viscount Halisham, Lord President of the Council and Minister for Science. When requesting a meeting with the MRC to discuss the administration of the 1876 Act, John Hall, Chief Secretary of the RSPCA declared:

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809 Ibid.p.2.
810 R. F. Rattray, "R.S.P.C.A. Campaign," *British Medical Journal* 1, no. 5282 (1962).p.946.
811 Ibid. p.946.
812 Hull History Centre [HHC], BUAV Papers, (U DBV2): DBV2/18/6, BUAV Branches Newsletter No.8. n.d. 1962?

> As you are no doubt aware the RSPCA is at present conducting a campaign on the subject of animal experimentation. We are not an anti-vivisection organisation and we are concerned only to strengthen the administration of the Cruelty to Animals Act 1876, and in particular, to bring a about a more adequate supervision of experiments.[813]

The RSPCA made it clear that they were not after the complete abolition of vivisection, but rather asked for a renewed investigation into the workings of the Act, most notably the number of inspectors and the methods of experiment, 'to ensure that every safeguard is imposed against suffering and needless repetition'.[814] The organisation had previously corresponded with the Home Secretary, Rab Butler, but had been refused a meeting on several occasions by him.[815] The RSPCA in a final letter addressed to Butler warned that 'the RSPCA has now no alternative but to make these matters a public issue',[816] and so they did, in addition to writing to the Minister for Science.

In spite of the RSPCA's acquisition of Royal Approval, they were still refused a meeting with the MRC. Halisham, in private correspondence with Harold Himsworth, Secretary of the Medical Research Council, deplored the RSPCA, writing that 'this is a body for which I have no great respect, but there are obvious political implications in refusing what on the face of it appears to be a reasonable proposal for discussion'.[817] A note at the bottom of the page written by Hailsham reveals further his disdain for the organisation, declaring that 'I have no respect for the integrity of the RSPCA, but we must tread warily'.[818] Hailsham eventually replied to the RSPCA, giving a detailed answer to their request into a review of the administration of the Act. The letter was dated June 1962, emphasising the ethical obligations of the MRC, making reference to the UFAW, and referring them back to the Home Secretary.[819] This worked, and the RSPCA responded, via John Hall, its secretary, saying 'it has been decided, that for the present, no approach shall be made to the Medical Research Council'.[820] Despite this rebuttal from the MRC, the RSPCA stepped up their public campaign against the Act. The pressure exerted over

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813 TNA, CAB124/1638, RSPCA Letter to Rt Hon. Viscount Halisham, Q.C. Lord President of the Council and Minister for Science, 1962. P.1.
814 ibid. p.1.
815 TNA, CAB124/1638, RSPCA Experiments on Animals, Cruelty to Animals Act 1876, n.d. 1962? pp2-4.
816 p.4.
817 TNA,CAB124/1638, Letter to Harold Himsworth from Lord Hailsham, 1962
818 TNA, CAB124/1638, Memo Written by Lord Hailsham, 1962
819 TNA, CAB124/1638, Reply to RSPCA from Lord Hailsham, 1962. pp.1-2.
820 TNA, CAB124/1638, RSPCA Reply to Lord Hailsham, 1962.

the past decade by a variety of organisations, including the influential work of the UFAW and public letters written by scientists calling for a review, meant that the Home Secretary felt compelled to establish inquiry into the workings of the Act, and did so on 30 November 1962.[821]

The Littlewood Inquiry

It wasn't until 25 June 1963 that Sir Sydney Littlewood, Chairman of the inquiry into the workings of the Cruelty to Animals Act, wrote to public bodies and newspapers to announce the review and to ask for evidence relating to experiments on animals.[822] At the same time, a committee was appointed to consider the administration of the Act. It included Admiral Sir Guy Grantham, Mr T.C. Green, Sir Charles Robert Harington, Sir Hugh Linstead MP, Mr Lionel McColvin, Colonel Sir James Millar, The Reverend Edward Rogers, Professor Francis Stammers, Mr Alasdair Steele-Bodger, Lord Walston, and Mr P. Beedle of the Home Office as Secretary to the Committee.[823] This was an group of doctors, scientists, religious leaders and Members of Parliament. During a debate in the House of Lords, Baroness Evelyn Emmet recommended to the Chairman that a woman should be present during the inquiry as 'women are not supposed to be quite so hardened or callous about these things as the male sex. One might have a woman doctor or nursing expert or zoologist on the Board. Certainly, I should like to see a woman on the Board'.[824] Subsequently three women were appointed to the Committee: Mrs Joyce Butler MP a Labour MP, Lady Barbara Dyer, aristocrat, who was Deputy Chairman (sic) of the juvenile court panel and former chairman of the National Federation of the Women's Institute, and Mrs Katherine Horsfall, a representative of the Liverpool Regional Hospital Board.[825]

With the Committee appointed, during the course of their inquiries they visited twenty-nine establishments, including the very secretive Porton Down Chemical and Biological Defence Establishment, in order to view animals before, during and after experiments,

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821 "Report of the Departmental Committee on Experiments on Animals."p.14. And see: Lyons, *The Poltics of Animal Experimentation*. p.195.
822 "Report of the Departmental Committee on Experiments on Animals." p.1.
823 Ibid. p.ii.
824 HC Deb 10 May 1962 vol 659 cc653-769.
825 TNA, War Office Registered Papers (WO188): WO188/2525, Home Office Committee of Experiments on Animals – List of Members for Visit t Porton Down on 24th June 1964, 3 June 1964.

and to talk to employees. Visiting these establishments involved some twenty-seven private meetings, taking eighty-three accounts from witnesses representing twenty-six organizations.[826] The organizations were diverse, ranging from pro- to anti-vivisection groups including the Royal College of Surgeons, Home Office, Medical Research Council, Ministry of Health, Ministry of Defence and Army Department, BUAV, NAVS, RSPCA, and of course from the UFAW.[827]

Because of the scope of this enquiry, in this section I will only be focussing on a few representatives notably Porton Down, the RDS and BUAV. Furthermore, I will be discussing only one of the main focuses of the inquiry: animal pain. The notion that an animal could feel pain and suffer psychological distress was something that scientists had begun to take seriously from the early twentieth century, most notably via the work of the UFAW (see chapter five). It was this inquiry, alongside the publiations of the UFAW, which contributed to a broader redefinition of animal pain and hence a change in the semantics of animal experimentation. It is here that we can observe how the description and purpose of animal experimentation was under contestation, a challenge which ultimately revolved around the idea of pain and suffering. Hence, I am arguing, alongside Lyons, that this analysis of the review of the Act in 1965 acted as a catalyst for the creation of animal experimentation legislation in Britain today,[828] but I also argue that it was a defining moment for the emergence of the Animal Rights movement in the 1970s.

Pain With A Purpose: Considering Stress, Distress and Psychological Pain of the Nonhuman

As has been described, the Research Defence Society was an umbrella organisation that represented the interests of the medical establishment. In light of the review of the Act they gathered together a team of scientists in order to defend animal experimentation. The team, comprised of a committee of experts within the RDS, were in fact all men, professors of medicine, biochemistry and physiology. They included Professor George Brownlee (Biochemistry), Professor J. A. B Gray (Physiology), Professor A. V. Hill (The Royal Society of Medicine), Dr W. Lane-Petter (The Medical Research Council), Dr W. R.Woolridge (representing veterinary surgeons). This committee also included Sir George

826 "Report of the Departmental Committee on Experiments on Animals." p.1.
827 Ibid.pp.203-206.
828 Lyons, *The Poltics of Animal Experimentation*. p.187.

Boyd (to represent Physicians, Pathologists and Microbiologists), Professor Macdonald (of the Pharmacological Society), Dr J. B. E. Baker (who became the secretary of the committee) and Sir Charles Lovatt-Evans and Sir Charles Harrington both eminent scientists.[829]

It is interesting to note that there were two members of the RDS who had connections to the UFAW: Dr Baker, author of UFAW's *The Scientific Basis of Kindness to Animals* at the time of its 3rd edition, and Dr Lane-Petter, who edited the second edition of the *Handbook* in 1957, and was director of the L.A.C.[830] Elite networks of scientists were integral to the perpetuation of animal experimentation, and this was no more evident than during debates arising during the inquiry about the language of animal pain as defined in the Act. Embedded in the 1876 Act was a definition of animal pain called 'The Pain Condition' which required that any animal suffering pain which was likely to be severe and endure must be killed after the experiment. Moreover, if an Inspector was present and saw such suffering from an animal, they could direct the researcher to 'destroy' them.[831] This definition of pain, and its consequents, caused some consternation amongst the scientists and researchers within the pro-vivisection camp.

This dismay was evident during a meeting held on 7 January 1963, where a new version of the Pain Condition was sketched out to submit to the committee of inquiry. Overall the meeting showed that the members of the RDS were satisfied with the powers of the Act, but they claimed that its wording was difficult to interpret. Their recommendations for change included changing the name of the Act, from the Cruelty to Animals Act to 'The Experiments on Animals Act', a recommendation to remove the expression 'calculated to give pain' throughout, when discussing experiments. Further the idea was to replace the sentence 'with a view to advancing or imparting knowledge or knowledge which will be useful for saving or prolonging life and alleviating suffering' to read 'the experiment must be performed by a person holding such a licence from one of Her Majesty's Principal Secretaries of State'. In order to establish this new discourse of vivisection, the RDS stipulated that a 'new qualifying opening' must be written and

829 The Wellcome Library [CMAC], Research Defence Society Collected Papers (PP/CLE/C.3): PP/CLE/C.3 Box 3, Research Defence Society, Minutes of Meeting of the Committee on the Cruelty to Animals Act 1876, 7 January 1963. p.1.
830 Lane-Petter, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*. And, Baker, "The Scientific Basis of Kindness to Animals."
831 "Report of the Departmental Committee on Experiments on Animals." p.55.

changed from the current one to: 'in any procedure likely to produce more than trivial discomfort the animal must during the whole of the experiment be under the influence of some anaesthetic of sufficient power to prevent the animal feeling pain.'[832] This meeting of RDS members, also included Sir Charles Lovett-Evans, a prominent British scientist who had worked on the development of chemical and biological weapons at Porton Down during and after the First World War.[833] In his written testimony to be sent to Littlewood he stated:

> Today, by far the greatest number of physiological experiments are carried out under full anaesthesia, so that standard experiments are quite painless… In the relatively few experiments in which recovery from anaesthesia is essential, the subsequent treatment is much the same as a human patient would have, and if there is any evidence of pain the animal is destroyed. The whole question of animal experimentation is one of priorities. If the lives of animals have priority over the needs and lives of mankind, there is nothing more to be said, and experiments on animals should all be prohibited.[834]

According to Lovett-Evans, experiments on animals were essential and the animals were well anaesthetised so as not to feel any pain. Human life far outweighed the life of an animal. Whereas before, animals had been used by pro-vivisectionists as analogous to the human; now a prominent man of science was demarcating the human from the animal in a social hierarchy, in order to promote the necessity of animal experimentation.

It was not only members of the RDS who raised the issue of the Pain Condition. When the Committee of Inquiry visited Porton Down Chemical and Biological Defence Establishment, they too highlighted the issue of animal pain. As will be recalled from Chapter three, the Crown did not bind any establishment run by the state in law. This meant research could be conducted without a government establishment being licensed. As we saw, there was a great deal of consternation and anxiety about this, as Porton Down were afraid the public might find out about the top-secret experiments and that they did not need to be licensed. In the end, government officials, scientists and solicitors decided that since research workers had to be licenced they were in effect legally protected by the Act, if rather vicariously.

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832 CMAC PP/CLE/C.3. Box 3, Research Defence Society Minutes of Meeting, 7 Jan 1963.
833 Robert L. Maynard Dr Timothy T. Marrs, Frederick Sidell, ed., *Chemical Warfare Agents: Toxicology and Treatment* (Oxford: Wiley-Blackwell, 2007). p.375.
834 CMAC, PP/CLE/C.3. Box 3, Evidence Submitted by Sir Charles Lovatt Evans Regarding the Research Physiologists' Need for Animal Experiments, Research Defence Society, n.d. 1963?

Even so, Porton Down and its laboratory animals breeding farm, Allington Farm, contributed significantly to the inquiry. With a hundred licence holders in the War Office, fifty-eight of whom were situated at Porton, the chemical and biological defence establishment played a prominent role in laboratory animal science.[835] The top-secret organisation allowed the committee to visit its UK site in Salisbury, and on 24 June 1964 in the conference room of the Chemical Defence Experimental Establishment, gave oral evidence as to the nature of the research carried out at Porton Down.[836] All of the inquiry committee were present, and representatives from Porton Down included Dr Paterson (Superintendent of Allington Farm), Lt Col Wilkins (Assistant Director and Army Vet) and Mr James (Director of both Biological and Chemical Defence at Porton of the Ministry of Defence).[837]

During the meeting, representatives of Porton Down answered a series of questions regarding research, compliance with the Act, licensing, certificates, animal husbandry and animal pain. Accordingly, the delegates characterised research at Porton Down as 'essential to the general welfare of the community and morally justified'. Warfare and welfare were not juxtaposed but rather coalesced to form a discourse of the animal in relation to the human, claiming that 'it was necessary to use animals for study of biological effects where the closest analogues to men were required'. Animals were seen as comparable with the human body and thus, essential. [838] Likewise the Porton Down scientists asserted that 'many discoveries obtained for research designed for defence purposes had been found to have civilian applications e.g. in the… development of immunology and the production of vaccines', and, with a nod made to the L.A.C. and UFAW, that Porton Down was at the forefront of helping to develop the 'emerging technology of animal laboratory science and animal production'.[839]

As far as the notion of animal pain went, the witnesses claimed that it was very difficult to detect the presence of pain in the animal and that it was 'not much easier to establish that it might be suffering discomfort or was "'out of sorts" unless the animals' ordinary

[835] TNA, WO188/2525. War Office Memorandum for the Home Office Committee on Experimental Animals, 1964. P.1.
[836] TNA, WO 188/2525. Committee on Experimental Animals, Minutes of the 23rd Meeting Held at the Conference Room, Chemical Defence Establishment, Proton Down, Salisbury, 24 June 1964.
[837] p.1.
[838] Ibid. p.1.
[839] Ibid. p.1.

behaviour was well known".[840] It was here that the hierarchal division of laboratory labour was demonstrated, with technicians being recruited 'just after the war from among redundant farm works, who had neither the interest for study and examinations' about the science of animal care and welfare, but were 'excellent and reliable animal handlers and could be trusted to notify licensees if their animals began to show signs of discomfort…Or to kill an animal as soon as symptoms of suffering became evident'.[841] Divisions of social class entered the laboratory in subtle ways, especially when it came to ending an animal's life. The Porton Down meeting concluded with the witnesses stating that the Act 'had worked well and did not require major revision' and that 'procedures that were not strictly experimental, e.g. the use of animals for harvest of isolated organs or tissue or for the production of vaccines and sera, should not be made subject to the full force of the Act'.[842] The committee heard about the total number of animals used annually by Porton, which included 100,000 mice, 300 cats, 30 dogs, 10,000 guinea pigs and 4,000 mice in total.[843] The witnesses were keen to emphasise the economic benefits of their establishment, telling the committee that any 'surplus animals… were sought after by many bona-fide research organisations and between 10-20% of production was sold to University Departments, pharmaceutical firms and other government departments'.[844]

The written reports sent to the committee of inquiry also supported omitting anaesthetics for certain experiments and continued to deny pain in the animal. A letter to the Secretary of the Committee from the Director of Porton Down, D. E. Woods, gave reasons as to why anaesthesia was dispensed with during the course of a series of experiments on the study of blast effects:

> It is emphasised that animals are placed in the Armoured fighting vehicles in crew positions where it is feared that marginal blast effects might occur. Blast effects may be so slight that animals appear physically unaffected. Histopathological changes in the tissues of such animals may also be minimal and, it is for this reason that anaesthesia has been dispensed with since anaesthesia itself may produce minor degrees of change...The hatches are always open within a minute or two or firing. If then an animal was seen to have

840 Ibid. p.2.
841 Ibid. p.6.
842 Ibid. p.4.
843 Ibid. p.6.
844 Ibid. p.6.

> suffered obvious injury by blast or fragment, the animal would be destroyed on the spot.[845]

The idea of psychological distress was not emphasised by Woods. In effect, Porton Down were denying the sentience of the nonhuman, and arguing that the determination of pain was subjective at best. The case for using animals to protect the nation was accentuated in the committee's report about their visit to the establishment: 'their [animals'] defensive value', it noted, 'may be a direct benefit in saving life and alleviating suffering'.[846] However, the Committee did reflect on psychological suffering, reporting that 'we paid special heed to the question of pain in defence experiments. We were given categoric assurance that no experiments had been, or were being, performed at Porton that cause pain or acute distress to an animal for an appreciable time'.[847] Additionally, a War Office Memorandum for the Home Office Committee on Experiments on Animals, Porton Down and related military establishments called for a redefinition of pain: 'pain should be specified more clearly and degrees of pain should be recognised with necessary statutory action laid down'.[848] Overall both the RDS, who represented the medical establishment, and Porton Down, were representing the military establishment, concurred that the present Act was acceptable, and that it worked to safeguards nonhuman animals from any form of pain. However, both sets of representatives were keen to challenge the contemporary definition of animal pain and that of which was enshrined in law, the Pain Condition. However, the BUAV were yet to present their oral and written testimony to the committee.

Anti-Vivisection Response

> The Intention of the Act is quite obviously to keep animal suffering to an absolute minimum and that it could only be regarded as legitimate in as far as it is for the purpose of advancing medicine (in the very widest sense) or improving health. This intention, however, is not fulfilled in the working of the Act. Any experiment to confirm what is already known, performed in relation to something not absolutely vital as that could be done without the use of animals, is clearly contrary to the spirit of the Act. Yet a large proportion of the experiments carried out under the Act are obviously such a nature. For instance,

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845 TNA, WO188/2525, Letter to the Secretary Committee on Experiments on Animals on Studies of Blast Effects, 1964. p.1

846 TNA, WO188/2525, Extract from the Littlewood Report on Visit to Porton Down Chemical and Biological Defence Establishment, 1965. p.122.

847 Ibid. p.122.

848 TNA, WO188/2525, War Office Memorandum for the Home Office Committee on Experimental Animals n.d.1964? p.3

> highly desirable shampoos and cosmetics maybe, it cannot be argued that they are matters of life and death; yet thousands of animals are used in the testing of these substances. Again, the keen competition of the rival drug companies, each with its own research and testing department, must inevitably mean that the same experiments are being duplicated and possible triplicated or even quadruplicated.[849]

The BUAV, alongside its member organisations, such as the Friends Animal Welfare and Anti-Vivisection Society and the Scottish Anti-vivisection Society, collaborated in submitting evidence to the committee. Despite their abolitionist position, the BUAV tempered their beliefs in order to present evidence for evaluation. It is clear from the quote above that experiments on animals were abhorred. Whereas the pro-vivisection groups, such as the RDS sought to change the language of the law, from 'vivisection' to 'experiments on animals', the abolitionist groups strived to keep this wording intact. Therefore, the intention of the BUAV was to indict science through its construction of nonhumans as helpless beings. The Scottish Anti-Vivisection Society claimed in its written evidence that 'There are many paths to knowledge. To seek it through the infliction of suffering on weaker creatures is, in our view, morally indefensible. Experiments on animals have become mania".[850] A wealth of evidence was presented to the committee that outlined their perspective on the Pain Condition. Interestingly, both sides of the vivisection debate shared similar sentiments when it came to discussing pain. The BUAV, in their testimony to the committee, declared that 'if pain was accepted as a critical matter for control, it should be interpreted in its widest sense to include distress, suffering and psychological stress'.[851]

It is obvious that the influence of the UFAW on the definition of pain in the animal was broad and encompassed both the pro- and anti-vivisection groups. However, the NAVS, alongside the BUAV, contradicted the RDS in their analysis of the Pain Condition, declaring in their written testimony that 'we would prefer to see the word "suffering" substituted for the word "pain"' and that 'the present form of provision is that an animal which is suffering pain which is likely to continue after the effect of the anaesthetic and that the same should apply if the animal has sustained any serious injury…these are

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849 Hull History Centre [HHC], (DBV2), DBV2/18/6, Memorandum Submitted by the Friends Animal Welfare and Anti-Vivisection Society, n.d. 1964?

850 HHC DBV2/18/6, Statement by the Scottish Anti-Vivisection Society, n.d. 1964?

851 HHC, DBV2/18/6, Committee of Enquiry: British Union for the Abolition of Vivisection Oral Evidence, n.d. 1964? p.3.

surely minimal requirements which should not be further watered down'.[852] Further, their insistence on keeping the word 'pain' contradicted the RDS's desire to alter the wording from 'pain' to 'suffering'. The question remains, how did the inquiry respond to such suggestions, and what was the end result?

Conclusions of the Littlewood Inquiry: The Growing Ubiquity of the UFAW and the Pain Condition

> We recommend, that the Act should be amended so as clearly to apply to an experimental procedure liable to cause pain, stress, or interference with, or departure from, an animal's normal condition of well-being.[853]

The Littlewood Report's findings were published in April 1965, and the government's response to was largely apathetic.[854] With eighty-three recommendations and appeals for new legislation in light of some of the findings, the main emphasis concerned the reform of the administration of the Act due to the increase in animal experiments in the post-war period. Recommendations included changes to the licencing system, methods of inspection and the number and quality of inspectors, greater public engagement with regards to experiments, and a more prominent role for the advisory committee.[855].

But where did the committee stand on pain? As the quote at the beginning of this section suggests, the inquiry recommended the definition of animal pain be changed to include the recognition of stress and distress in the animal. It was no coincidence that the UFAW were referenced throughout the published report, especially in the section related to 'Pain in Animals'.[856] As discussed in chapter four, the UFAW constructed the idea of the "stressed animal" and a whole discourse of welfare of the nonhuman in the laboratory developed as a result of this. It was claimed that animal welfare was integral to experimental science so that experiments would become more efficient, and methodological techniques would possess greater validity. The redefinition of pain was made in light of the writings of the UFAW, and the final publication of the Littlewood Report included substantial references to this particular organisation. This, it could be

852 HHC, DBV2/18/6, Analysis of the Recommendations of the Littlewood Departmental Committee on Experiments on Animals, Submitted by the National Anti-Vivisection Society, n.d.1964? pp.1-3.
853 "Report of the Departmental Committee on Experiments on Animals." pp.57-58.
854 Lyons, *The Poltics of Animal Experimentation*.p.206.
855 "Report of the Departmental Committee on Experiments on Animals." pp.190-199.
856 Ibid. pp.54-63.

argued, signalled both a change in scientific discourse in relation to the nonhuman but also a transformation of the discourse of law when it came to regulating animal experimentation.

However, one wonders, as Elaine Scarry does in her book *The Body in Pain: The Making and Unmaking of the World*,[857] how pain becomes defined and objectified. According to Scarry, pain is inexpressible.[858] Therefore, what mechanisms of power are at work in order to facilitate the expression of pain? *Who* does the expressing and on whose behalf? Despite Scarry's focus on the human body, there are parallels that can be drawn in relation to the nonhuman body, pain and its objectification through structures of power. Her most notable contribution to this work would be in her definition of pain something which is completely ineffable, and consequently, pain 'does not simply resist language but actively destroys it'.[859] In other words the bodily experience of pain is one that cannot be described or voiced, even by the one experiencing it. This is significant in light of the Littlewood report, as the definition of laboratory animal suffering and pain was acknowledged by those very people who inflict that pain - the scientists - and this language of animal pain was brought into being by the law makers and politicians who are far removed from its processes.

As we have seen, the Littlewood Inquiry demonstrated a shift in thinking about nonhuman animals compared to that of the 1912 Commission, namely, the ability for animals to suffer psychological as well as physical pain. This idea of openly and publically expressing this aspect of pain in the animal became a powerful way of politically representing vivisection as a force for good and one which was concerned about the welfare of the animal. The Report demonstrated that animal pain could be verbally expressed in an appropriate manner, and thus, through this rhetoric, enabled the construction of an image of the law as a force for good in the world and one that ensured pain's diminishment in the laboratory:

> Pain is a subjective symptom… It is not surprising therefore, that detection and assessment of pain in the inarticulate animal should present such formidable problems. Nevertheless, these problems must be faced by those responsible for

[857] Elaine Scarry, *The Body in Pain: The Making and Unmaking of the World* (Oxford: Oxford University Press, 1985).
[858] Ibid. p.3.
[859] Ibid. pp.4-5

> the regulation of experiments on animals and some guidance as to the proper approach to them can be reasonably expected by licensees.[860]

Pain thus became an ambiguous phenomenon and a subjective experience, something inexpressible and difficult to see in the animal. This acknowledgment of the subjective experience highlights an important shift in thinking about the animal. Further, these verbal representations of pain in the Report were also expanded to encompass psychological pain, and the committee noted how many of the witnesses made analogical comparisons of mental illness in humans to the psychosomatic effects on animals, especially when it concerned psychological experiments 'designed to find forms of treatment for disordered states in human patients'.[861] Consequently, in the era of stress (see chapter five), even the nonhuman had to have some form of psychological neuroses. The concept of stress provided the committee and scientists with a device to at once continue with experimental science, but at the same time, one which made the nonhuman even more invisible:

> Within the concept of "pain", it is desirable to provide for at least three states of suffering: (a) discomfort (such as may be characterised by such negative signs as poor condition, torpor, diminished appetite); (b) stress (i.e. a condition of tension or anxiety predictable or readily explicable from environmental causes whether distinct from or including physical causes); (c) pain (recognisable by more positive signs such as struggling, screaming or squealing, convulsions, severe palpitation).[862]

The first two clauses constitute noticeable signs of withdrawal in the nonhuman and the third clause the more physical and vocal signs of suffering. But surely, the question remains, that any laboratory animal undergoing experiment will suffer all three at any given time? If the nonhuman is undergoing procedures designed to create discomfort, they will inevitably suffer and be hurt in the process. Further, their captivity in the laboratory animal house, in wire cages laid out in racks and in enclosed environments, exacerbates the pain felt and the psychological distress encountered. Hence, the committee and scientists rendered both physical and psychological pain visible whilst suppressing them by objectifying and defining them. They *naturalised* laboratory human-animal relations via the redefinition of the Pain Condition and the concept of stress. This in effect was an obliteration of the experience of pain in the nonhuman: the law

860 "Report of the Departmental Committee on Experiments on Animals." p.56.
861 Ibid. p.57.
862 Ibid. p57.

transformed this pain into a form of hierarchical and disciplinary power over the nonhuman.

The Committee sought to legitimise their definition of pain by acknowledging the UFAW, as they were the only organisation to 'offer serious criticism of the text of the [Pain] Condition'.[863] The UFAW exemplified the stressed animal perspective and this came across in their rewording of the Pain Condition. For instance, they stated that any discomfort felt by an animal that was likely to continue, should be 'painlessly killed as soon as the experiment has been completed'. They also suggested that the Pain Condition should be 'embodied in the law as a cardinal feature of the whole pattern of control'.[864] The committee accepted the suggestions of the UFAW, claiming that their draft of the Condition 'is not that it would make it more objective or precise the standard of assessment [of pain], but that it placed in the setting of a more specific range of suffering subject to the Act, the licensee who detects "pain" as distinct from "discomfort" or stress will be immediately altered to consider its severity and likely duration'. The Committee therefore fully 'endorsed the principles of the UFAW proposal and recommend[ed] that they should be embodied in the Act'. [865]

Furthermore, the Report drew on the recommendations made in the *Handbook on the Care and Management of Laboratory Animals* regarding anaesthesia and how to eliminate 'the risks of premature recovery' from experiment.[866] Hence, death of the nonhuman was also dealt with in the Report, under the heading 'Painless Killing'. Again, reference was made to a UFAW pamphlet published in 1950 and written by the organisation's technical secretary Jean Vinter, entitled *Kind Killing*.[867] Speaking on humane killing, the Littlewood Report referred readers to Vinter's pamphlet:

> We were told that manual methods were sometimes used in laboratories to destroy rabbits and smaller rodents e.g. by striking the back of the head smartly with the side of the hand or against the edge of a bench. We learned that this method was quick and, in experienced hands, simple and painless. Nevertheless, we formed the view that many licensees would welcome further guidance on this subject as new methods of painless killings are explored and established, and we

863 Ibid. p.58.
864 Ibid. pp.58-59.
865 Ibid. p.59.
866 Ibid. p.60.
867 Ibid. p.62. and F. Jean Vinter, "Kind Killing," (London: UFAW, 1950).

> recommend that this subject should dealt with in the code of practice we recommend later in this report.[868]

The laissez faire attitude of the Report's description of killing indicated three things: firstly, the separation of 'body from text',[869] or in other words, the nonhumans' experiences of manifest pain from the aforementioned descriptions of suffering. Secondly, this was linked to the UFAW publication, and its oxymoronic title 'Kind Killing'. This was a rhetorical device that detracted from the nature of the task: that of putting to death a sentient being. Thirdly, the advice on how to kill with kindness via the work of the UFAW was inherently gendered. The pamphlet conveyed techniques of killing to those people who 'may have to destroy animals when there are no experts available' advising that 'it is best to select methods most suited to one's temperament and to practice it on dead animals until it can be performed skilfully'.[870] The pamphlet gave instructions on methods of killing according to specific mammalian species, however, those who were to kill rabbits had to be a particular kind of person and the instructions were to:

> Hold [the rabbit] by the hind legs in the left hand and strike the back of the neck violently downwards with a stick about 1 inch thick and 15 inches long or with a poultry stunner. *A man or really strong woman* can use the "heel" of the hand i.e. the back edge of the hand held with the fingers extended and rigid, but a very hard blow is required.[871]

The act of killing became a gendered process through the stipulation of needing a man or *really* strong woman to kill. The nonhuman almost disappears through the language of killing. Where is the Pain Condition in respect of this process of 'destroying'? Ironically, the action of killing forms part of the legal act of the humane approach to getting rid of an animal that is suffering.

This raises key issues about the nonhuman in both law and science at the time, with particular reference to points raised by Judith Butler in her work *Frames of War: When is Life Grievable?.*[872] Butler questions the social and political 'frames' that contribute to western society's construction of who is a living subject in their own right. Butler asserts

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868 "Report of the Departmental Committee on Experiments on Animals."pp.62-63.
869 Scarry, *The Body in Pain: The Making and Unmaking of the World.* p.70.
870 Vinter, "Kind Killing." p.1.
871 Ibid.p.8.(my italics)
872 Judith Butler, *Frames of War: When Is Life Grievable?* (New York: Verso, 2016).

that certain lives cannot be grasped as living if they are not firstly seen as alive, and because of this, how we construe what is living is an issue of power that is politically shaped.[873] In other words, the very 'being of life itself is constituted through selective means, as a result we can't refer to this "being" outside the operations of power'.[874] Nonhuman animals in the laboratory are articulated through these mechanisms of power via the discourse of law, which in turn produces articulations as to what counts as a living, active being. Accordingly the UFAW recognised the nonhuman as a living object, but not one with agency or moral standing in the world, hence animals became active objects but not active *moral agents*.[875] This clearly influenced the Littlewood Committee's interpretations of pain in the animal and consequently of "painless killing". What we see here is a paradigm shift in the construal of the nonhuman in experimental science and its regulation. The body of the animal, although it feels pain and experiences suffering, is constructed with words and meanings that define who it is and how it feels pain. As Butler states, 'to be a body is to be exposed to social crafting and form'.[876] The discourse of suffering contained within the law became an 'ethico-political judgement',[877] one that entailed making distinctions between what was human and what was animal, what constitutes sanctioned pain, suffering and killing compared with unsanctioned hurt, distress and murder. In other words, what counts as animal, and what counts as human.

The Littlewood Report failed to make any significant policy changes and instead reinforced the 1876 Act's administrative procedures. This was evidenced by its emphasis on experimental research being fundamental to the advancement of knowledge, with animal welfare a secondary commitment that was only considered in terms of the effect on experimental methodologies. The Government did not implement any of the recommendations and clearly favoured the interests of the pro-vivisection groups, whilst slowly, over the course of the decade following the Report, increasing the number of inspectors.[878]

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873 Ibid. p.1.
874 Ibid.
875 Ibid. And see: Stephanie Jenkins, "Returning the Ethical and Political to Animal Studies," *Hypatia* 27, no. 3 (2012).
876 Butler, *Frames of War: When Is Life Grievable?* p.3.
877 Jenkins, "Returning the Ethical and Political to Animal Studies."
878 Ryder, *Victims of Science: The Use of Animals in Research*.pp.169-170, Lyons, *The Poltics of Animal Experimentation*. p.218.

Animals, Women and the Law

Overall, the investigation into the Cruelty to Animals Act, 1876 involved many different groups on both sides of the vivisection debate. Further, the decision to review the Act, was politically-motivated rather than one of ethical and moral praxis. The main debates surrounding the relevance of the Act for contemporary scientific practice revolved around the idea of animal pain and suffering. We also saw the influence of a burgeoning animal welfare discourse on the legal representations of animals, animal experimentation and pain. However, as we have seen, enshrined in law was the notion that the nonhuman was an object, or a piece of property that could be owned by the [hu]man scientist. This final concluding section of the chapter advances the idea of the nonhuman in law as being parallel to discourses about women as represented in the legal structures of mid-twentieth century Britain. I will be arguing in this section that both animals and women were entangled in what Kimberlé Crenshaw calls 'intersectional oppression[s]'.[879] This means the binding together of several systems of subjection,[880] in this case, the structural interrelationship between animals and women through the confines of legal discourse, and policies that are not directly associated with either agent. Crenshaw asserts that 'what distinguishes this intersectional problem [from others] is that the policy in question is not in any way targeted toward women... it simply intersects with other structures to create a subordinating effect.[881] In this sense, we can argue that the legal systems in place at the time were very much organised and based on principles of hierarchy that subordinated some groups to others, namely, animals over humans. Further, on closer inspection, animal experimentation law and the regulation of vivisection also implicitly subordinated women through its representations of the nonhuman. Only by addressing the philosophies of the legal system in relation to animal experimentation can this be exposed.

Within the Cruelty to Animals Act 1876, its review in 1965 and the regulation of vivisection, one could argue that the legal positioning of the nonhuman as a piece of property, and the representation of the nonhuman body in pain as formulated through the creation of a select criteria to determine that pain, intersects with the law at the time

[879] Kimberlé Crenshaw, "The Structural and Poltical Dimensions of Intersectional Oppression," ed. Patrick R Grzanka (Colorado: Westview Press, 2014). pp.16-22.
[880] Ibid.p.17
[881] Ibid.p.21.

in relation to women, whether that was with regards to women's position in the public or private sphere, in employment and/or in relation to marriage, divorce and sexuality. In other words, the nonhuman body shared its legal position with that of the female body in mid-twentieth century Britain. As Catharine MacKinnon, a prominent feminist legal scholar, argues, 'the legal system's response to animals is gendered, highlighting its response to women's inequality to men as well'.[882] This is because of the socially structured binaries that manifest as hierarchies in particular societies at particular points in time. MacKinnon explains these social hierarchies as divided into the binaries of animate-inanimate, human-animal and male-female divisions.[883] This too echoes the discussions in previous chapters regarding the philosophies and methodologies of science: is the problem then, not necessarily men *per se*, but rather the ubiquity of an ideology that stems from paternalistic thinking?

It is no coincidence that the antivivisection movement was historically dominated by women, and emerged at the same time as the suffragette movement in the nineteenth century. As Mary Ann Elston, amongst others, has demonstrated, the nineteenth century also saw a conflation of women's bodies with that of images and representations of nature and animals in medical and popular cultural narratives.[884] The idea of what is seen as 'natural' shapes a particular society's views on who is an active moral agent and subject in their own right and who is not.[885] This then links to the question of law and legal rights: the person in law who is deemed "rights-bearing" rests upon an historically contingent *liberal* theory (private property ownership) of legal philosophy still present in the practice of law in the western world today. It creates a distinction between the objects of knowledge (non-rights bearers) and the inquirers or subjects (rights bearers).[886] This kind of legal doctrine holds that animals have no inherent rights or interests, or at least none that supersede human ones.[887] Therefore, nonhumans became classified as property and as having object status. This too paralleled the objectification of women as

882 Catharine MacKinnon, "Of Mice and Men: A Feminist Fragment on Animal Rights," in *Womens Lives, Mens Laws*, ed. Catharine MacKinnon (Boston MA: Harvard University Press, 2007). p.163.
883 Ibid.
884 Elston, "Women and Anti-Vivisection in Victorian England, 1870-1900."pp.259-294.
885 Grbich, "The Body in Legal Theory."p.62.
886 Ibid.p.63.
887 Gary L Francione, *Animals, Property and the Law*, 2nd ed. (Philadelphia: Temple University Press, 2007). p.46.

represented in law,[888] as for a time, women were seen as ownable property and non-rights bearers.[889] In 1929 by order of the Privy Council, a select group of senior political advisors to the Monarch enacted a law to allow women to become persons in their own right.[890] However, despite women's personhood status, the mid-twentieth century was witness to a host of complex and often contradictory (legal) doctrines which affected women's' lives, and paralleled those of the nonhuman in scientific research:[891] were women seen as not fully human, as active objects? This question is at its most resonant when we address issues of pain and suffering, as noted by MacKinnon:

> Women's suffering, particularly in sexual forms, has not delivered us full human status. It has gotten us more suffering. That women feel, including pain, has been part of stigmatizing them, emotions in particular traditionally have been neglected to the lower, animal, bodily, side of the mind-body split.[892]

The parallels between animals and women in law can be demonstrated most palpably through the idea of the dividing line between sanity and madness and the shaping of public policy in relation to this. As will be recalled, the objectification of pain in the nonhuman in the Littlewood Inquiry was expanded to include signs of stress and distress. I argued that with its objectification through these criteria, the very experience of pain is actually demolished by its discursive formation as espoused by legal and scientific representatives. This too echoes the 1957 Royal Commission on Mental Health and Deficiency, and the 1959 Mental Health Act which described mental illness as 'illnesses which need medical treatment'.[893] This paved the way for psychiatrists to 'cure' people of their mental illness through such techniques as leucotomies and lobotomies, (brain surgeries). The types of people recommended for such surgeries were of course depressed women who were victims of domestic violence at the hands of their husbands.[894] This, then, supports the notion of intersectional objectification through the philosophies of law and their material implications on animals and women. As MacKinnon observes, the way women have suffered at the hands of the legal system has meant that their pain and suffering has been 'denigrated, and denied and when

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888 Grbich, "The Body in Legal Theory." p.69.
889 Johnson, *Power, Knowledge, Animals*. p.131.
890 http://www.mmu.ac.uk/equality-and-diversity/doc/gender-equality-timeline.pdf, *The Women's Timeline* ([cited 01/05/16). [accessed: 01/05/16].
891 Wilson, *Only Halfway to Paradise Women in Postwar Britain: 1945-1968*.p.3.
892 MacKinnon, "Of Mice and Men: A Feminist Fragment on Animal Rights." p.171.
893 Wilson, *Only Halfway to Paradise Women in Postwar Britain: 1945-1968*. p.114.
894 Ibid.

recognised, more often used to see us as damaged goods then as humans harmed'.[895] Taking into account the above, does this sound familiar with view to the conceptualisation of the nonhumans' pain and suffering?

The key to understanding these intersectional oppressions is by addressing the philosophies of science and law, and how they buttress, embellish and support each other by claiming to demonstrate ways of knowing and understanding nonhuman and human others through this discourse of "Rights" and through a growing discourse of animal welfare. These discourses of rights and welfare affected definitions of pain, which also became gendered.

The Power-Pain Nexus

> Although other animals can be experimented upon only because they are not human, if they were not like humans nothing would be gained for humans by studying them. But what precisely is gained? How can pain be measured, quantified, interpreted, especially if chronic pain changes an animal's response? Once gained, how is the knowledge applied? Once the dilemma (animals are different from us; animals are like us) is acknowledged, it attaches itself to the rationale of the animal experiments…The wedge of differentiation between humans and other animals, which can never be precisely located, is both necessary for and undercuts the premise of scientific knowledge.[896]

Is the infliction of pain on the nonhuman body under experiment a way to de-subjectify them, as much as it contributes towards subjectifiying them and classifying them as being a body in pain that is other than human?[897] Is the pain experienced by the nonhuman an acknowledgment of their subjectivity and presence in the world, or is the classification of their experience of pain an exercise of power, manifested and exercised through the institutions that sanction the infliction of that pain in first place? This chapter has explored in several parts the *effects* of power over the experimental animal by the legal establishment, and how these effects help codify and structure gender relations in broader society.

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[895] MacKinnon, "Of Mice and Men: A Feminist Fragment on Animal Rights." p.171.
[896] Adams, *Neither Man nor Beast: Feminism and the Defense of Animals*. p.50.
[897] By subjectifiying them, I mean to attribute a status to them as living beings, but not as sentient ones, in other words their status as active objects (see chapter four).

What has become clear is that in order to maintain animal experimentation in mid-twentieth century Britain, scientists had to acknowledge that nonhuman animals could suffer pain and psychological distress. To conclude this chapter I want to discuss the gendered nature of pain and its classification by law under the concept of the 'power-pain nexus'. It is evident of this chapter and the preceding ones that pain forms the basis of the experience of the nonhuman animal in the laboratory, and its relationship to humans. This experience of pain, from my preceding analyses in this work, echoes the comment made by feminist philosophy Wendy Lynne Lee: that it is rooted in Cartesian dualism.[898] This dualism is implicit in the construction of power-knowledge relations mentioned above, but also in the very experience of pain itself, and the reasons why the nonhuman is acknowledged to experience that pain. The infliction of pain, whether it be within the laboratory, in the slaughterhouse, or farm, or on human beings because of their sex, class and/or race is a form of violence. Violence on the micro-scale acts as a veil to the violence perpetrated on the macro-scale. As Lee asserts, violence 'is so deeply woven into our social institutions (law, medicine, marriage, family and so on)'[899] that it inevitably goes unnoticed and even becomes normalised.

This normalisation of violence on nonhuman animals was evident during the review of the 1876 Cruelty to Animals Act. Science, law and government were so entangled with each other that they formed networks of powerful relations. Social actors within these institutions exchanged correspondence, even scientists such as Dr Lane-Petter, moved between these institutions and contributed to the development and regulation of laboratory animal science (see chapter six). Therefore, in the Littlewood Report's review of the Pain Condition, the idea of the experience of pain in the nonhuman was discussed at length and a new definition was created that encompassed psychological aspects. is the question follows: how can I claim that despite this changing definition of pain to one that recognises both the mind and the body, that the definition, and thus the experience of pain was *still* dependent on Cartesian dualism as a way to organise the world? That this was so despite the growing support from various scientific circles for a rejection of Cartesianism?

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[898] Wendy Lee, "On the (Im)Materiality of Violence: Subjects, Bodies, and the Experience of Pain.," *Feminist Theory.* 6, no. 3 (2005). p.277.
[899] Ibid.p.280

It is here that we might turn to the work of Bibi Bakare-Yusuf, Elaine Scarry, and the aforementioned Wendy Lee to address this question.[900] As described above, Scarry claims that pain (in the human) lacks referentiality, and hence precedes language. In other words it de-subjectifies the person and rests in the material realm of the body.[901] In a sense, Scarry is right, the human in pain becomes a person disassociated from language, culture, meaning and understanding.[902] But on the other hand, this too reinforces the human/animal divide by perceiving the human in pain as returning to a prelinguistic state that *animalises* the person, which is a form of speciesism. Scarry postulates a form of dualism that ignores the nonhuman experience, presupposes that it is only human beings that have the gift of language, culture and experience and in turn reiterates the discourses of the animal/human dualism which circulated in mid-twentieth century Britain. While I am sympathetic to this account, and its usefulness to this aspect of animal law, Scarry ultimately reinforces the very logic that supports the institutions that inflict pain.[903] She assumes nonhuman animals are lacking cognitive/emotional capacities and inadvertently turns the experience of pain into a process of 'Othering'.

Nevertheless, the lawmakers and scientists conceptualised and normalised the experience of pain in the nonhuman laboratory animal by their very acknowledgement and objectification of that pain. To draw on Scarry's notion of the indescribability of pain is important, yet it needs to be extended to include the nonuhman body. A body that is seen as being always a part of culture and language: *inscribed* by culure and experienced *through* culture. The black feminist scholar Bakare-Yusuf, discusses this process with regard to slavery. The situation of the body outside of culture was 'clearly not the case for slaves' as from the moment of enslavement, a slave had 'no claim to her person, no right to citizenship; she [was] the property of her master or mistress'.[904] This is not to compare the experience of slaves with that of laboratory animals, but Bakare-Yusuf's point is relevant, as the body of the nonhuman, from the moment of their use in the laboratory to the discussions which abounded in the 1960s about their legal standing; had

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900 Bibi Bakare-Yusuf, "The Economy of Violence: Black Bodies and the Unspeakable Terror," in *Feminist Theory and the Body: A Reader*, ed. Janet Price and Margrit Shildrick (Edinburgh: Edinburgh University Press, 1999). Scarry, *The Body in Pain: The Making and Unmaking of the World*, Lee, "On the (Im)Materiality of Violence: Subjects, Bodies, and the Experience of Pain.."
901 Scarry, *The Body in Pain: The Making and Unmaking of the World.*
902 Lee, "On the (Im)Materiality of Violence: Subjects, Bodies, and the Experience of Pain.."p.280.
903 Bakare-Yusuf, "The Economy of Violence: Black Bodies and the Unspeakable Terror."
904 Ibid.p.319.

no claim to rights, but rather was seen in law as having the status of property (see above).[905]

This property status of the animal allowed for the continuation of vivisection, which removed any chance of acknowledgement that animals were living sentient beings *in their own right*. In other words the nonhuman animal was already - despite the acknowledgement from scientists of the capacity for animals to suffer physically and psychologically – de-subjectified. This new definition of pain (as discussed above) further entrenched this de-subjectification (they were given active object status), which made the laboratory animal *more* vulnerable to objectification.[906] This further ingrained the subject-object dualism, which produced the circumstances within which the experience of pain in the nonhuman had a purpose: that animal experimentation was both expedient and right, that science was the best way to develop a civilisation and defend one, thus 'licensing any pain necessary to secure it'.[907] This included the military and medical laboratory that produced a biopolitics of care, which had disciplinary techniques that made the nonhuman docile, and under its control.

> The tortured body speaks through the subject's attempts to protect herself, through her compliance, and the through the physical space she occupies... Her very comportment signifies the institutions and practices reinforced in the violence acted out against her. Even in death, her body signifies her an individuated thing whose identity is past or spent, and whose treatment in death is as much prescribed by law as her actions in life… Dualism functions as a justificatory instrument in law in that, while it is not the truth about the law's foundation in the positing of materiality through language, it does provide the conceptual ontological framework within which devaluation, and the violence necessary to enforce it can be codified and preserved.[908]

Pain then, was fundamental to all aspects of *legal* laboratory life, with reference to the above. The Power-Pain Nexus can be defined as the (historical) *conceptualisation* of a body experiencing pain, forged by various powerful institutions in society (medical, military and legal institutions). Institutions that exercise this power-knowledge collude in *regulating* bodies, subjectifying some bodies (male) whilst desubjectifying others

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[905] Johnson, *Power, Knowledge, Animals*, Francione, *Animals, Property and the Law*.
[906] Bakare-Yusuf, "The Economy of Violence: Black Bodies and the Unspeakable Terror."P.318. Lee, "On the (Im)Materiality of Violence: Subjects, Bodies, and the Experience of Pain.." pp.281-282.
[907] Lee, "On the (Im)Materiality of Violence: Subjects, Bodies, and the Experience of Pain.."Ibid. p.284.
[908] Ibid. p.288.

(nonhuman and women). This creates relations and hierarchies of power between groups of living beings.

Conclusion

This chapter has shown the emergence of the changing definitions of pain in the nonhuman laboratory animal and how key state and scientific actors discussed the regulation of laboratory life through discourses of pain. Networks of power-knowledge were enhanced in this period in order to standardise animal experimentation and legitimise its practices. The next chapter discusses all the key themes that have emerged during the course of this research, and concludes this thesis with an overview of its main points.

Chapter Seven
Conclusion

The primary focus of this thesis has been upon the production of medical and military scientific knowledge through the use of nonhuman animals and how this domain of knowledge intersects with the legal domain. As we have seen, in order to maintain the continued use of nonhuman animals in scientific research, a discursive shift in the construction of the nonhuman under experiment had to occur. This discursive shift can be expressed as a move away from the animal as seen as passive object to view the animal as one which is active, yet essentially still objectified. Animals gained what I termed an "active-object status", still objectified yet acknowledged as living and docile.

Through this construction of the nonhuman as living matter, discourses of animal welfare in mid-twentieth century Britain emerged to help maintain science's hegemonic status and enable to continuation of animal experimentation. This emergence of discourses of care/welfare was most evident in the redefining of the experience of pain in the nonhuman animal, via science's acknowledgement of animal stress (albeit a biologically determined definition of this). This paradigm shift was encapsulated in discussions about changes in the lawful definition of pain under the Cruelty to Animals Act, 1876, during its review in the 1960s. Relations between science and government were strong in the era immediately after World War Two, and their mutually reinforcing networks of power have been evident throughout this study.

My argument in this thesis has been two-fold: firstly, that the construction of scientific knowledge through the use of nonhuman animals was one that created subject-object binaries, which had powerful and detrimental consequences for nonhuman animals. Secondly, this objectification of the nonhuman had resultant power-knowledge *effects* that reinforced the continuation of specific kinds of scientific knowledge and its associated masculinist ontology of positivism. Consequently the *effects* of these power-knowledge relations were gendered and had implications for (and intersections with) other subjugated groups in British society, most significantly for this thesis, women. This study pursued three research questions, and if we revisit these, we can see how animal experimentation in mid-twentieth century Britain still unconsciously enforced Cartesian

dualisms, which as a consequence were gendered. The following questions were asked at the outset of this thesis:

- How is it that in both the theory and practice of science the nonhuman body is objectified, and how, as a result of this, does the animal body *as object* presuppose them as being useful for animal experiments?
- What kinds of knowledge does laboratory animal science produce, under what circumstances and methodologies? Do the knowledges produced link to the exercise of power both within and without the laboratory?
- Is the production of scientific knowledge through the use of animals gendered and what are the effects of such knowledge production?

Animal Body as Presupposed Object

In relation to question one, the creation of active objects (or in Foucauldian terms, as discussed in chapter five: docile nonhuman bodies) was facilitated through the techniques of welfare promulgated by the UFAW. This was done in the name of creating an economics of efficiency in laboratory human-animal relations: reducing wastage of animals, improving their physical and psychological health in order to make experiments more valid and housing animals in clean conditions so as to reduce the occurrence of extraneous variables such as certain diseases that were not part of the experimental procedure. Through the mechanisms of laboratory human-animal relations in mid-twentieth century Britain, the idea of welfare as we saw in chapter five, increased the animal body's utility and therefore increased the power the human had over the nonhuman body, establishing 'in the body the constricting link between an increased aptitude and an increased domination'.[909] In other words, scientific welfarism created healthier animals but in doing so, increased regulation, control and domination over the nonhuman body to ensure their healthiness was fit-for-purpose. Animal bodies were already seen as objects, which lent to further objectification. Structured by the discourse of stress examined in chapter five, the actual material spaces of the laboratory, as we saw, became gendered and heavily disciplined spaces of care and welfare. Women were recommended as being perfect for the role of laboratory assistant or "nurse" to the

[909] Foucault, *Discipline and Punish: The Birth of the Prison*.p.138.

animals, and the uneducated farm worker (see chapter six) became the ideal executioner, acting as the person who would kill the unwanted and sick animals.

Knowledge Production and Power Relations: The Authorising Gaze

As was discussed in chapter five, one of the ways of managing animal bodies and behaviour was through the scientists' gaze. This gaze over the laboratory animal was structured in this period by the work of the UFAW and Laboratory Animals Bureau. Laboratories and nonhuman animals became standardised in mid-twentieth century Britain via the circulation of the UFAW's discourses of care towards the laboratory nonhuman. If we look back to chapter five and the nonhuman animals' role in the formation of a medical conceptualisation of 'stress', the gaze over their living bodies became essential in order to delineate the very symptoms of this condition.

The gaze over the dead animal body was examined in chapter four, exercised in the post-mortems conducted during the biological weapons trials by Porton Down Chemical and Biological Research Establishment. A strict adherence to a post-mortem technique was required, which equipped the scientists involved with a gaze that could conceptualise disease as a means of weapons of war. As I argued in this chapter, the post-mortem acted as an exercise of power over the nonhuman which was grounded in the socio-political and helped to establish the creation of a military-*animal*-industrial complex in mid-twentieth century Britain. The animal body, subjected to the gaze of the scientists, became divided and separated into sections, each aspect representing a piece rather than the whole of the nonhuman. In this chapter I drew on Lisa Johnson's Foucauldian inspired *discourse of lines* to elucidate the complex power-knowledge relations between the animals, scientists, the British military and the broader socio-historical context in the creation of the military-animal-industrial complex.[910]

This gaze over the nonhuman animal not only entrenched a standardised view of the nonhuman but also created a body that was docile, yet still objectified. It was only through the gaze of the scientist that the status of nonhuman animals changed, and a whole set of discourses and practices surrounding laboratory animals became established. The nonhuman body was being 'rewritten', with the help of the judiciary and their

[910] Johnson, *Power, Knowledge, Animals*.pp.56-62.

relations with various scientific bodies (see chapter six), so science could continue its practices. This meant a shift to more 'humane' practices in laboratory human-animal relations, as was evidenced in chapter five.

Gendered Science and Knowledge Production

Throughout all the chapters, I have argued that science was gendered and helped create gendered power-knowledge relations. Both animals and women became subjected to the male gaze, and as a result became objectified and used to *create* knowledge and powerful discourses about the world, as evidenced in chapter three with their use in the creation of biological weapons in the name of 'defence', and chapter four with the discourse of pre-menstrual stress and menstruation. The effect of this gaze is one that exemplifies power-knowledge relations which have been demonstrated throughout this thesis, notably, in the philosophical underpinnings of science and jurisprudential ones in law (as outlined in chapter four and six). Implicit in the methodologies of biological warfare trials and the jurisprudence of the Cruelty of Animals Act 1876 was the reliance on Cartesian dualisms that rendered women and animals on one side of a dualistic divide, and that entrenched their inferiority to that of the human male. As we can see, there are links between scientific knowledge and legal knowledge creation.

Likewise it is worthy of note that through the male gaze and the creation of such binaries, laboratory animals became individualised and recognised as having individual 'personalities'. This too, was a form of disciplinary power over the nonhuman body that combined with the spatial layout of the laboratory, the result of which was that nonhuman animals, through the male gaze, were to become even more subjugated in the relations of power-knowledge. This individualisation via the male gaze created subject-object binaries that were masculinist and had implications for both animals and women. These binaries, as discussed in chapter four, were inherently masculine and rested in the philosophical assumptions of positivism. The very methodologies of science, its positivistic ontology and absolute belief in objectivism contributed towards the development of the military-animal-industrial complex. Laboratory animal science in mid-twentieth century Britain was gendered and powerful.

Power over both animals and women was regulated through different yet comparable techniques. Both forms of power encapsulated scientific knowledge about the bodies of animals and women. The history of the female body is tied to that of the history of the animal body and of course, the male body. This ties to power-knowledge relations which discursively construct bodies through techniques pervasive in modern society, in this case, mid-twentieth century Britain. The power-knowledge of the discourses of laboratory animal science shows that gendered disciplinary power can be articulated through the very performance of science and its enunciation of an objective reality through the paradigm of positivism as evidenced in chapters four and five.

As we saw in chapters four to six, mid-twentieth century Britain was an era of experts who took up powerful positions in government departments such as in the Ministry of Supply, the Medical Research Council and the Home Office, all of which recruited scientists to advise on technology, industry and law making. This scientific approach to governance infiltrated all areas of British life. Britain in this period was a technocratic state. Forging scientific understandings of the world was imperative in order to re-build a Britain that was suffering from great economic and social losses after the war, and losing its grip upon Empire. This scientific approach advocated the unabashed use of nonhuman animals, and its methodology was one that described and analysed methods for attaining a particular goal. Returning to the chapters in this thesis, this positivist approach was particularly advocated in laboratory animal-dependent science in the post-war period, and via the work of the UFAW, most notably in its Handbook on *The Care and Management of Laboratory Animals*.[911]

This striving for control over nature is a form of power that was inherently gendered. Power-knowledge relations promoted the masculine worldview at the expense of the feminine.[912] Animal experimentation upheld this notion, even at the UFAW's declaration of its rejection of Cartesianism (see chapter five). Science in Britain still pursued the positivist methodology, which, as Foucault claims, instilled upon social life a certain arrangement of knowledge about the world,[913] creating a set of classifications about the nonhuman, replete with psychological, physiological and social characteristics. These

911 Worden, ed., *The Ufaw Handbook on the Care and Management of Laboratory Animals*.
912 It is worthy of note that I am speaking of the masculine and feminine as historical social constructs, not in an essentialised manner. See introduction for 'note on terminology'.
913 Foucault, *The Order of Things*. p.172.

classificatory mechanisms, that included the acknowledgment of psychological dimensions in the nonhuman animal, ensured that they would continue to be used in experiments. The very methodological approach used to test on animals further entrenched this classificatory knowledge about them. Positivism dealt in absolutes and strict universals, advocated theory-testing, and rested upon *a priori* assumptions that ultimately:

> delimit[ed] the totality of experience [of] a field of knowledge, define[d] the mode of being of the objects that appear in that field, provides man's [*sic*] everyday perception with theoretical powers, and defines the conditions in which he can sustain a discourse about things that is recognised to be true.[914]

This power-knowledge derived from the state's experts enabled a transformation of the laboratory animal (and woman). It also provided the basis of laboratory animal science in post-war Britain, which rested upon the dualistic assumptions of the doctrine of positivism, in order to subjugate bodies and make them docile. This was most noticeable in discussions of animal pain in chapter six, and its changing legal definition during the review of the 1876 Cruelty to Animals Act, which I called the power-pain nexus.

For the most part then, this thesis has documented the nature of laboratory human-animal relations in mid-twentieth century Britain and demonstrated that animals played an integral part in state science and structuring ideas concerning gender roles in mid-twentieth century Britain. The gendered aspect of science in mid-twentieth century Britain was bifurcated: firstly, science itself was masculinist (through its ontological and epistemological underpinnings, and methodologies – see research questions two and three), and secondly via its outcomes which had detrimental effects on those deemed extraneous to masculinity, in this case animals and women (research questions one and three). Consequently, this thesis has helped to render visible the cultural and social nature of science, and how the creation of laboratory animal science was far from objective but in fact, drew on the social norms and values of contemporary Britain. This has been evidenced through the use of animals in experiments conducted in the military and medical arenas as well as its regulation by law. Overall power-knowledge relations and their effects on nonhuman animals and other subjugated groups in society has been the main focus of this work. With this study I respond to other feminist histories of science that have neglected to take into account the significant role of the nonhuman within this

[914] Ibid. p.172.

history, and have overlooked the crucial developments in this sphere in mid-twentieth century Britain.

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