ABSTRACTS FOR ANIMAL RESEARCH UNBOUND

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Rachel A. Ankeny (University of Adelaide): "Animal Research Beyond Traditional Lab-Field Boundaries: Adapting and Evolving Norms in the Wild in Australia"

Regulations and standard best practices are well-developed and explicitly articulated for laboratory animal research in Australia, and public controversies over laboratory-based research have been relatively limited. However increasing attention is occurring to research with wild animals, particularly given extensive media coverage of issues associated with biodiversity, invasive species, and environmental issues including drought. This paper develops a typology of wildlife research programs in contemporary Australia and explores various norms underlying such research programs, along with parallel applied efforts relating to land, environmental, and species management. Using key case studies associated with native species such as koala and invasive and non-indigenous species including feral cats and dogs, I argue that there are a range of underlying understandings of and attitudes toward animals inherent in various types of research and management. It is critical to develop more sophisticated understandings of Australian understandings of wild animals in order to maintain reflective research practices that also allow the public to be successfully engaged in debates over the value and the potential limits for various types of research.

Brad Bolman (History of Science, Harvard University): "Dognitive Impairment: Alzheimer's Disease and Destructive Plasticity Unbounded"

Alzheimer's disease, first diagnosed at the start of the twentieth century, repeatedly appears in the media as one of the twenty-first's oncoming "epidemics" due to an aging and longer-lived global population. But what exactly "Alzheimer's Disease" *is* remains hotly contested: anthropologist Margaret Lock divides the camps into a "localization" theory, focused on neuropathology, and an "entanglement" theory that draws connections between mind, body, and environment. But one challenging finding of recent research for both groups, she notes, is the presence at autopsy of "Alzheimer neuropathology" in individuals who showed no signs of the disease: "destructive plasticity," philosopher Catherine Malabou's term for such change, is not always observably destructive.

This paper explores research to develop a beagle dog model of Alzheimer's disease (AD). Because beagles previously served in extensive military gerontology and toxicology research, their aging is argued to mimic that of human beings. While mice make up the majority of organisms participating in neurodegeneration studies, beagles are positioned as translational intermediaries between the "genetic" information provided by rodents and the application of treatments to humans due to their longstanding role in pharmaceutical testing.

This liminality, however, is further complicated by two claims: dogs do not "naturally" get Alzheimer's, nor does AD-like canine dementia exactly mirror human AD. To resolve these paradoxes, researchers have argued that "environmental causes" of AD are shared by domesticated pets and have developed a set of canine cognitive tests that are analogous but non-identical to those given to human AD patients. The canine tests have, in turn, been given to humans with cognitive disabilities in a double-sided unbounding of the disease and its species-specificity. As this paper argues, what it means for humans to

have Alzheimer's has shaped and been shaped by what it means for dogs to possess a mind that can deteriorate. Understanding and treating Alzheimer's may not only imply, then, but also necessitate a re-evaluation of the bounds of intellect itself.

Raf de Bont (University of Maastricht): "Hamster Numbers: On pest controls, reintroductions and animal agency"

Over time, numbers of European hamsters (*Cricetus cricetus*) in the Southern Netherlands have been subject to much scrutiny and controversy. In the late 19th century, policymakers who considered them too numerous (and invasive) set up eradication programs. When numbers collapsed in the late 20th century, however, preservation campaigns and reintroduction programs followed. According to some media, the investments in the latter has made the hamster into the most expensive undomesticated animal of the Netherlands. In my paper, I will address the changing geographical, cultural and ecological position of the European hamster. I will use the story of the hamster in the Dutch province of Limburg to reflect on animal agency, and, more in particular, on how animal numbers make a difference in human histories. Finally, I will draw on the case of the European hamster to think about the place of 'wildness' in the agricultural and urban landscapes of Western Europe – areas, thus, that hardly qualify as 'wilderness'.

Karina Burns (University of Adelaide) "Keeping Animal Research Practices in Australia Honest: A Discussion of Transparency, Translation of Animal Research and Replacement"

This paper aims to draw together a number of themes that have emerged from my research, centring around the future of animal research in Australia. The concept of transparency within animal research practices is a hotly debated and contentious issue both within Australia and internationally. Transparency in research refers to the flow of information from the scientific community to the broader public. This may include the availability of information on practices used in animal research, the species and number of animals used, the husbandry and housing practices, or the aims and anticipated value of the research. There is also debate in the literature around the translation of findings from animal research to human clinical outcomes. Shanks and Greek (2009) and Knight (2011) have critically evaluated, and in the case of Andrew Knight, conducted quantitative research addressing the issue of translation, articulating in detail the problems associated with using animals as models for human disease and for carcinogenicity and toxicology testing. Finally, the framework of 'the 3Rs' (Russell & Burch, 1959) within the setting of modern animal research raises new questions. The construct of 'replacement' has given rise to debate, both in how this principle is applied within a regulatory setting, and its connection to the development of non-animal models in research. While the structure of animal research regulation aims to protect the welfare of research animals, it has been suggested that these systems in fact enforce the instrumental use of animals. There is an interplay between these discussions when appraising the current state of animal research in Australia and considering future directions. These discussions

raise the questions of whether current practice of animal research is valid, and, even if it is, how to continue to improve welfare standards by communicating practices and outcomes.

Angela Cassidy (University of Exeter), "Care as a driver of controversy: understanding and contesting badgers and bovine TB in the UK"

The controversy over whether to cull wild badgers to help control the spread of bovine tuberculosis (bTB) in British cattle herds has been ongoing for nearly fifty years. This question has plagued several generations of politicians, policymakers, scientists, veterinarians, conservationists and animal advocates since they learned that badgers can carry bTB in the early 1970s. Questions of what is known, who knows, who cares, who to trust and what should be done about the complex connections between cows, badgers and the microbe *M.bovis* have been the source of scientific, veterinary, policy, and public debates ever since. While these debates have overtly focused on questions of evidence and expertise, questions of care have remained implicit, despite their repeated centrality in shaping policy decisions about bTB and 'badger control'. This is curious given the increasingly heated and polarised nature of the public controversy, particularly since the Coalition government's decision to return to badger culling in 2010. In this paper I will argue that changing intersections, alliances and divergences between the multiple cultures of care have shaped policy at crucial points over the history of the badger/bTB controversy. These involve the 'cultures of care' (Davies et al, 2018) of three intersecting epistemic communities who have been involved with policy and public debates over badger/bTB since the 1970s: *animal health*; *disease ecology*; and *badger protection*. Even within these groupings, changing intersections between cultures of care are discernible, aligning with shifting alliances over the history of the controversy. While most scholarship on care in science, medicine, conservation and agriculture focuses on its importance for building positive relations between humans, other animals and wider environments, some have explored more violent and conflicted forms of care (e.g. Van Dooren 2015). I draw upon this work to argue that in recent years care has been a significant driver of conflict and controversy over badgers and bTB as its cultures of care have diverged over the years. Those involved in the controversy care deeply, but who or what they care about and indeed what practices constitute care in the first place are very different. A sense of shared care within these epistemic communities may be co-constituting beliefs in an absence of care between these groups, fostering mutual hostility. I argue that these caring drivers of conflict have further enabled the entanglement of badger/bTB with adjacent environmental and agricultural controversies, and wider processes of political polarisation over the past decade.

Gail Davies and Rich Gorman (University of Exeter) "From networks to fretworks: Patient involvement and animal research"

This paper introduces research from the Animal Research Nexus project, which is tracing recent attempts to actively involve patients in conversations around animal research. The rise of formal practices of Patient and Public Involvement (PPI) can be seen as a networking activity that develops new linkages and connections between patient groups and laboratory animal research. Patients increasingly have a role and voice in setting research priorities and funding, reviewing and questioning research proposals,

making decisions about whether research addresses important and relevant questions, and shaping ongoing research through roles on steering groups. The expectations for PPI around animal research are multiple, with funders, researchers, institutions, and others looking to patient involvement to address the many gaps in research systems, from translational relevance to public understanding. However, these interfaces also inherit many of the absences and ambiguities of earlier conversations around animal research, such that encounters are structured as much by negotiation with these gaps, as they are by the construction of new relationalities. In our work, we use interviews, participant observation, and workshops with biomedical researchers, engagement professionals, and patients and members of the public involved in small scale experiments in PPI to understand how these encounters are experienced. We are interested in how they reframe responsibilities for defining gaps and redistribute the anxieties and uncertainties that arise from seeking to resolve them. We suggest this *fret-work* is central to the production of a new *network*. In this paper, we seek to give shape to the structural and emotional characteristics of this emerging conversation by introducing the concept of the fretwork as an additional prompt to analysis beyond that embodied in the imagery of networks. The fretwork we trace is not only constituted through interrelations and interconnectivity, but also through the voids and lacuna around animal research: patients don't know how to grapple with their complex ethical roles and responsibilities; practitioners are apprehensive about how to manage potential public and lay members concerns; researchers are unsure about how to translate lay-knowledge into practices making a meaningful difference to research. Through tracing the fretted structure of patient involvement with animal research and making these visible for all participants in workshops for discussion, we hope to enhance reflexivity and the capacity for meaningful encounters. Overall, we seek to enact a nexus approach that understands how the power to define stakes and responsibility to care in animal research is being redistributed across a nexus of health, welfare and science that is 'a continuous and continuing construction that embraces contradiction, variousness, and dispute' (DuPlessis and Quartermain 1999, 22).

Michael Dietrich (University of Pittsburgh) and Nathaniel Crowe (UNC Wilmington) "Mapping the Organismal Landscape in Developmental Biology"

Early twentieth century developmental biologists were captivated by the intricate and complex process of transformations that led from a fertilized egg to an adult animal. Their research faced a severe problem though: how to see the details of this process in embryos that reveal internal differences to outside observers. To visualize development, biologist, such as Hans Spemann and later Nicole L'Douaren, created trans species chimeras first in amphibians and then in birds. These chimeric monsters exploited the plasticity of early development to create visual difference that make the observation of development possible. As fantastic as these chimeras were, they did not become the subject of ethical controversy until nuclear transplantation became feasible and human-animal chimeras became a consideration. The transition from chimera as fantastic creation to worrisome monster seems to hinge on both ideals of human control and the animal-human boundary.

Julien Dugnoille (University of Exeter) Pleasure on the farm: Enhancing the sexual welfare of cattle through the promotion of a non-normative lens on scientific theory and practice about animal sexuality

Evolutionary and biological hypotheses about the non-reproductive sexual behaviour of animals, including dominance expression and practice for heterosexual consortship, or even as a functionless pathology, overlook heteronormativity in the elaboration of these theories. At the end of the 20th century, it was highlighted by Bagemihl that while pleasure was generally recognised as part of animal reproductive sexuality, this was hardly ever acknowledged in non-reproductive, non-normative sexuality. However, zoologists, biologists and evolutionary theorists have, since then, failed to address heteronormativity in the scientific practice and theories about animal sexuality.

Our project, which is still very much in its infancy, seeks to understand if heteronormativity is still at play in scientific practice and theories about animal sexuality, and proposes recommendations to counter this lens with a new non-normative paradigm. In dialogue with academics in the natural and human sciences, and with reference to a population of fly-grazing bison in Belgium (Bison bison), we will analyse how consortship among animals is edited in past and current scientific practice and academic discourse. We aim to document non-normative acts which can be interpreted as sexual pleasure-seeking activities (including but not limited to masturbation and same-sex consortship) and non-sexual pleasure-seeking activities such as play. Simultaneously, the project will also shadow the research process of two ethologists with expertise in domestic bovine sexuality.

Sara Green[1], Mie Seest Dam[2] & Mette Nordahl Svendsen[3] (University of Copenhagen): “Mouse avatars in personalized medicine”

A common problem in oncology is that cancer tumors of individual patients often respond differently to medical treatments, compared to standardized cell cultures or model organisms with virus-induced cancers. Patient-derived xenografts (PDX) have been proposed more than 30 years ago as a way to address this problem, but were initially considered to be too resource-demanding to be a sustainable option for clinical practice. Due to recent advances in experimental research and genomics, so-called “mouse avatars” are now being implemented in cancer laboratories and clinics as a route to personalized patient care and precision medicine. By injecting and growing tumor samples from individual patients under the skin of immunodeficient mice, the hope is to develop PDX models that can better mimic the treatment response of patient-specific cancers. Personalized mouse models raise intriguing philosophical questions about whether PDX models enable a new form of “one-patient paradigm” in medicine or even a “science of the individual”. It is, however, unclear what representations of the person are at stake in the case of mouse avatars. (How) do mouse avatars substitute the individual and with what effects? And

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how can inferences about human cancers be made from interventions on these? In this paper, we examine the implications of mouse avatars as a new way for cancer patients to understand their disease and as a new tool to guide clinical decisions. To address these questions, we combine insights from philosophy of science and ethnographic studies of the use of PDX models in a cancer clinic. Tumor cells and tumor DNA are often described as unwanted non-selves to get rid of, but tumors also develop through complex relationship with the tumor microenvironment and body as a whole. It is therefore interesting to explore how relations between patients, tumors, and their mouse avatars are established, experienced, negotiated, and used to inform clinical practice. We explore the extent to which mouse avatars generate new hopes and expectations, and how scientists and clinicians respond to complex issues concerning the relation between species and the evidence status of personalized mouse models.

Beth Greenhough, Reuben Message, and Alexandra Palmer (University of Oxford) "Made for mice? ASPA at the boundaries of laboratory animal research"

The Animals (Scientific Procedures) Act (A(SP)A) of 1986 regulates animal research in the UK. While "animal research" typically conjures up images of mice or rats being used for medical research in stainless steel cages in white-walled rooms, other species and sites are also captured under A(SP)A. Drawing on qualitative research within specific animal research communities, we focus on how scientists and technicians who work with wildlife in situ and zebrafish represent their relationship to A(SP)A and the associated regulations and institutions that help implement it. Drawing on Leigh Star's (2010) later reflections on the relationship of boundary objects to the emergence of new standards, we analyse these experiences as the expressions of "residual" categories – the perspectives of social groups who feel they do not quite "fit in" with the expectations of standards, and whose situations in turn require new boundary objects to mediate their relationships. We specifically explore the requirement that animals under A(SP)A receive daily health checks – a task that is for different reasons challenging to perform in the context of in situ wildlife research and in zebrafish facilities – and demonstrate that efforts to standardise health-checking for fish and wildlife have in turn led to the creation of additional boundary objects in the form of guidance documents and welfare assessment tools.

Pru Hobson-West and Renelle McGlacken (University of Nottingham) Sentience, societal sentience, and animal research

The idea of animal research as 'unbound' encourages a focus on those who may be outside the walls of the laboratory, yet are still crucial actors in the formation and functioning of the animal research nexus. Notwithstanding recent moves towards more openness and transparency (McLeod and Hobson-West 2016), the figure of the 'general public' is usually physically absent from the laboratory research environment. Indeed, their direct engagement is usually via opinion polls, with associated methodological problems, and claim and counter-claim from stakeholders about what these polls actually show (Hobson-West 2010).

However, whilst they may be physically absent, imaginaries of the public are interwoven into animal research policy and practice. Indeed, documentary analysis has shown that UK regulation entangles assumptions about animal sentience, with assumptions about what publics feel about animal sentience. In short, the legislation not only aims to reduce pain, suffering and lasting harm for animals; it also aims is to 'reduce societal pain, suffering, distress, and lasting harm potentially caused by laboratory animal science'. The latter can be summarised as *societal sentience* (Hobson-West and Davies 2018).

Careful empirical work is needed to evaluate the reach of societal sentience, identify what evidence is marshalled (or not) to support this concept, and explore how actors construct or resist this imaginary. In this presentation, we introduce a recent Mass Observation Project Directive on the topic of 'Using animals in research'. Early analysis suggests a messy, complex picture in terms of sentience, with publics critically reflecting on their own knowledges of non-human others, and expressing uncertainty towards the epistemological bases of species distinctions. In conclusion, whilst several authors have focused on affect relations in the laboratory, we show how assumptions about affect *outside* the laboratory also have an important impact on how we understand, and how we research, the animal research debate.

Robert G W Kirk (Centre for the History of Science, Technology and Medicine (CHSTM) University of Manchester) and Edmund Ramsden (School of History, Queen Mary University of London) A home in the laboratory: dogs and the health of the American nation, 1940-1966

On the 26th November 1948 John Tuck, a Pennsylvania dog breeder, was arrested delivering dogs to Johns Hopkins University, Baltimore. The accusation was of cruelty to animals. For Alan Chesney, Dean of the Medical School, this was the latest example of harassment that endangered much more than medical education and research at Johns Hopkins. It was a direct threat to the public health of the city, state and nation. This paper examines the campaign against the experimental use of dogs and the medical response. This culminated in a city-wide referendum in December 1950 where Baltimore's citizens voted in favour of ownerless and homeless dogs being made available for medical research. We argue that this outcome was a result of the medical profession's successful appropriation of the unique place that the human-dog relationship held in society. Hitherto, this had been used by critics of animal research to portray the dog as an emotional, intelligent, and faithful animal that had been cruelly sacrificed to human interests in the laboratory. In contrast, Baltimore's medical community presented dogs as willing experimental participants knowingly contributing to the betterment of public health. The human-dog scientific relationship was recast as one of willing sacrifice made by one species for the good of another. One dog, named Anna, came to symbolize and embody canine heroic sacrifice. Through newspapers, personal appearances, and a widely circulated short-film, Anna presented "her story" of the development of a surgical technique for saving the lives of so-called 'blue babies'. Service in the name of science offered abandoned animals a home in the laboratory, a purpose and way to serve the very society that had seemingly abandoned them. This strategy became a model for national campaigns, conducted at state level, designed to create a favourable legal climate for animal experimentation. By reconstructing the story of Anna, we show that the canine hero's active role in helping medical science accrue favourable city and state-level legislation was a critical component in shifting antivivisectionist resistance

to animal experimentation to the Federal level, shaping what would become the Animal Welfare Act of 1966.

Sabina Leonelli (University of Exeter) and Rachel A. Ankeny (University of Adelaide) "Repertoires and animal movements in and out of research"

A lesson learnt from recent philosophical work on the use of organisms as research models is that the justification of what counts as "good models" is not necessarily tied to the fit and/or similarities between model and target (Frigg & Nguyen 2018). Any organism can be used as a model for any target, depending on *how* that representational claim is supported (even organisms that actually do not exhibit the trait in question). We propose a typology of uses of organisms as models for research, which depends on whether or not such use is associated to the adoption of a full-blown repertoire (Ankeny and Leonelli 2016). Cases such as model organisms, microbes in microbiome research and coral reefs subjected to biomedical-style interventions are good examples of organisms whose treatment as research models depends strongly on the success of a particular repertoire (Ankeny and Leonelli forthcoming). This is not the case for so-called Krogh organisms (Green et al 2018). We explore the advantages and disadvantages of either situation. The uses of models (and related representational claims) associated to repertoires has advantages of longevity and robustness vis-à-vis multiple uses; models not associated to repertoires are more flexible, dynamic and explorative. This has implications for movements of organisms across boundaries and contexts, a discussion of which concludes this paper.

Ankeny, RA and Leonelli, S. (2016) Repertoires: A Post-Kuhnian Perspective on Scientific Change and Collaborative Research. *Studies in the History and the Philosophy of Science: Part A* 60: 18-28.

Ankeny, RA and Leonelli, S (forthcoming 2019) Using Repertoires to Explore Changing Practices in Recent Coral Research. In: Matlin, K., Maienschein, J and Ankeny, R *From the Beach to the Bench: Why Marine Biological Studies?* Chicago, IL: University of Chicago Press.

Frigg, R., & Nguyen, J. (2018). The turn of the valve: representing with material models. *European Journal for Philosophy of Science*, *8*(2), 205–224.

Green, S., Dietrich, M. R., Leonelli, S. and Ankeny, R.A. (2018) "Extreme Organisms" and the Problem of Generalization: Interpreting the August Krogh Principle. *History and Philosophy of the Life Sciences* 40:65.

Simon Lohse (Leibniz University Hannover) Institutional and socio-epistemic barriers for alternative methods to animal experimentation

Millions of animals are used for basic and translational research purposes every year. In 2011 alone, more than seven million vertebrates and cephalopods were used in Europe (this number is based on the most recent official numbers from the European Commission, 2013). To reduce this number and to comply with the 3R-principle ("refine, reduce, replace"), animal rights activists, politicians and sympathetic life scientists have been promoting the development and use of alternative methods to animal experimentation based on cell and tissue cultures, organ(s)-on-a-chip technology and computer modelling (in short "non-animal-methods"). These efforts have, however, not led to an extensive replacement of animal experimentation in basic and translational science. In this talk, I will attempt to shed some light on this state of affairs with reference to key institutional and socio-epistemic barriers for the development and implementation of non-animal methods. In the first part of my talk, I will provide

some background regarding animal experimentation in Europe and sketch the current landscape of non-animal-methods. I will then highlight a number of institutional factors that inhibit the development and use of non-animal-methods, such as the current funding structure and challenges in establishing the right kind of (data-)infrastructure. In the main part of my talk, I will turn to a socio-epistemic issue that has received some attention in the literature, namely the relatively low level of engagement of the scientific community in developing and promoting non-animal-methods. This situation is usually accounted for in two contrasting ways. The first way is based on the assumption (shared by many basic researchers) that animal experimentation is just indispensable for progress in science. Others (usually developers of non-animal-methods and activists) state that it is mainly dogmatism that inhibits the development and use of non-animal-methods. Both accounts, while containing some truth, fall short of explaining the complexity of the situation. For this reason, I will develop an alternative and more sophisticated explanation for the relatively low level of engagement of the scientific community which is based on insights from philosophy and sociology of science. More precisely, my talk draws on recent work on model organism research and scientific repertoires (Levy & Currie, 2015; Ankeny & Leonelli, 2016) and on the "risk-spreading-argument" (Kuhn 1959/D'Agostino, 2010). I will argue that the inertia in replacing animal experimentation is rooted (a) in secondary epistemic functions of animal-based systems of practice (such as anchoring research communities and establishing shared methods and standards) and (b) in the socio-epistemic logic of science in general. I will show that my account offers a deeper explanation of the relatively low level of engagement of the scientific community that can integrate the true aspects of the discussed "standard accounts". In the last part of my talk, I will connect my socio-epistemic analysis to the above highlighted institutional barriers and draw out some implication for the advancement of non-animal methods.

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European Commission. (2013). Seventh Report on the Statistics on the Number of Animals used for Experimental and other Scientific Purposes in the Member States of the European Union SWD(2013)497. Brussels.

Ankeny, R. A., & Leonelli, S. (2016). Repertoires: A Post-Kuhnian Perspective on Scientific Change and Collaborative Research. Studies in History and Philosophy of Science Part A, 60, 18–28.

Kuhn, T.S. (1959). The Essential Tension: Tradition and Innovation in Scientific Research. In: C. Taylor (ed.): The Third University of Utah Research Conference on the Identification of Scientific Talent. Salt Lake City: University of Utah Press, 162–174.

Levy, A., & Currie, A. (2015). Model Organisms are Not (Theoretical) Models. The British Journal for the Philosophy of Science, 66(2), 327–348.

James Lowe (University of Edinburgh) Humanising and dehumanising pigs in genomic research

Pigs have been conceived of, and used, as biomedical models for decades. A large animal model, their physiology and immune system is close enough to humans to make them valuable for toxicological testing, pharmacokinetic and pharmacodynamic studies, surgical research and training, and as a model of various diseases, such as cardiovascular conditions. They are a favoured potential source of non-human organs for transplantation.

Their potential as a model for humans has been used to justify funding research in the genomics of swine. Although funds have often ended up coming from more agriculturally-oriented sources, pigs' closeness to

humans has aided such research. To enable them to make use of the resources and data available from the larger and better-funded field of human genomics, pig geneticists and genomics researchers have identified and characterised ever more precise relations of homology between the genomes of pigs and humans.

I will discuss two endeavours that develop and exploit this. In one, pig genomics research, researchers attempt to manage the tension between using human genomics as a guide without 'humanising pigs'. Comparative mapping between human and pig genomes was an approach pursued by pig genomics researchers from the beginning of systematic pig genome research efforts in the late-1980s. It required initial data on the existence of, and relationship between, mapped genetic markers.

Ascertaining comparative relationships on which inferences of correspondence between the two species could be built opened up an ongoing iterative process of identifying and refining patterns of correspondence. I provide two examples of this. One example concerns mid-1990s chromosomal painting using labelled probes derived from human DNA libraries. In the other, I describe how data from the human genome project was used in various stages of the project to produce a reference genome of the pig. In these instances and others, pig genome researchers had to use their own species-specific knowledge of swine to ensure that the humanising potential of their methods was countered by means of dehumanising the genomic representation of the pig.

The other endeavour I examine is xenotransplantation research, the transplantation of organs from pigs into humans. There, differences between pigs and humans (and non-human primates used in experimental trials) revealed at the genomic, immunological and physiological levels are interrogated to identify ways in which 'donor' pigs can be humanised to reduce the likelihood of rejection of the transplanted organs. These pigs must be humanised, and this process is enabled by the existence of data and knowledge concerning them that has itself been produced by a dialectic of humanising and dehumanising pigs.

An analogous dialectic exists in historical and social scientific studies of genomics research on non-human animals. Methodologically, one must dehumanise genomics, departing from narratives dominated by human genomics and the human genome project. The interrelatedness and co-constitutive nature of genomics research on different species demands, however, that we focus attention on the ongoing construction of nexuses between research on the human and the non-human. Through exploiting the infrastructure of human genomics, genomics more generally is indeed itself humanised.

Dmitriy Myelnikov (University of Manchester) A fragile consensus: Controversy, lobbying, and the origins of the Animals (Scientific Procedures) Act 1986.

Until 1986, laboratory animal research in Britain had been regulated by the 1876 Cruelty to Animals Act. Despite prolonged attempts at reform, notably the 1965 Littlewood report, legislative change met with little enthusiasm, and subsequent government pushed new legislation in the long grass. With the expansion of animal rights and changing political orientation of animal welfare organisations, pressure for reform grew in the 1970s, culminating in the 1986 Animals (Scientific Procedures) Act (ASPA) that

transformed animal research. This paper will examine the origins of ASPA, and the careful balance of stakeholder perspectives that had to be achieved. By drawing on recently opened Home Office records, personal papers of some campaigners, and oral history interviews, this paper will show how Home Office civil servants achieved careful balance between scientific organisations, professional bodies, and what they viewed as 'moderate' animal welfare campaigns. The legislative activity was accompanied with public relations strategy that sought to convey a sense of accountability and perform transparency. In the process of these negotiations, concepts acquired novel legal and scientific significance (e. g. procedure, pain, alternatives), and new roles were created within animal facilities, notably for veterinarians. This paper will argue that the constant emphasis on the fragility of the consensus was a useful tool in ensuring the passing of ASPA, and that combining the diverse field of perspectives aided its regulatory longevity.

Nicole Nelson (University of Wisconsin) "Good science and good welfare, hand in hand? Alignments and misalignments between experimental rigor and animal care"

Advocates for reform in preclinical research have argued that one reason findings from animal models often fail to translate into clinical benefits for humans is that preclinical research is not conducted with enough scientific "rigor." The majority of animal studies, reformers claim, use inadequate sample sizes, do not properly randomize animals to treatment groups, and fail to properly blind the experimenter. This paper will examine how policies/practices aimed at enhancing reproducibility intersect with policies/practices for ensuring animal welfare, with a particular focus on blinding and animal care.

Promoting the practice of blinding in preclinical research is consistent with the principle of reduction—conducting low-quality studies that must later be repeated means that more are likely to be used in the course of answering a research question. And yet in practice, blinding techniques often sit in tension with animal care. In some settings where care practices are highly valued (e.g. nonhuman primate research), blinding may not be feasible because of the intimate knowledge that researchers have of individual animals. In other instances, blinding may prevent researchers from recognizing and mitigating side effects from experimental treatments. This paper will focus on how the aims of animal care might be reconciled with the aims of improving experimental rigor, and what role social scientists can play in this process.

Sara Peres & Emma Roe (University of Southampton): Reduction vs Reproducibility? Gene/care entanglements in the bodies and origins of laboratory mice

The current enthusiasm for research involving genetically altered (GA) animals raises questions about the social contract around animal research. The high proportion of animals used solely for breeding purposes undermines the principle of Reduction (Russell and Burch, 1959) and attracts criticism from animal protection groups. Simultaneously, concerns about the reproducibility of mouse data (e.g. Perrin, 2014) call into question the idea of future benefits. In response, regulators and other stakeholders seek to address this in the management of breeding and sourcing of laboratory mice, arguing for sharing resources and making breeding efficient (RSPCA, 2009; HO, 2016).

Our research explores these developments, and their influence in the production and consumption of laboratory mice, through a focus on the specific capacities of the murine body and the sophisticated practices of producing strains, colony maintenance, and cryopreservation. Doing so makes visible how concerns about assurance - of quality control, availability, or intellectual property – figure prominently in this landscape. We illustrate this argument with empirical data from 21 interviews and ethnographic work carried out with researchers and staff in biobanks and biological services units in the UK (2017-ongoing).

Our data suggests that maintaining the strain appropriately is of paramount importance in supply and colony management practices. Archives and commercial breeders market their ability to provide a quality controlled 'product', and there are calls for centralising the production of transgenic mice for scientific, as well as welfare reasons. So, breeding techniques and supply networks are shaping and being shaped by an entanglement of concerns towards both the reproducibility of mice and of research. Caring for the individual animal is the product of the complex interplay between concerns for the strain, the rigour of the research, and ultimately its scientific and social benefits.

Altogether, the creation and maintenance of colonies have become subject to deeper ethical deliberation, but should be understood as practices where questions about how to assure the social, the scientific, and the ethical status of animal research are being played out. From this perspective, there are benefits from a nexus interpretative approach (see Davies et al, forthcoming) to this topic, as it is forged in the interrelations between science, welfare, and health.

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Mette Nordahl Svendsen (University of Copenhagen): "Carrying across Bovine Colostrum from the Farm to the Clinic: Cows, Pigs, and Humans in Interspecies Kinship"

This paper investigates the translation of farm animals—their life, their death, and their substances—to neonatal intensive care units (NICUs). Based on ethnographic fieldwork in Denmark, I unravel practices of interspecies kinship forged in turning research piglets into substitutes for humans when they help translate bovine colostrum from Danish dairy farms to preterm infants deprived of mother's milk. In this translational process, cows, pigs, and humans eat from the same source and become kin. However, stepping closer to this process, an anxiety about species belonging comes to the fore among researchers in the Pig Laboratory and parents in the NICU. As much as the erasure of species boundaries is part of what it takes to become viable human in the NICU-setting, so too is the erection of species boundaries. Consequently, carrying across bovine colostrum from the farm to the clinic demands skills and work far beyond the biological modeling of the pig in enclosed environments. It involves continuous processes of

forging interspecies kinship and pushing back. By tracking animals and their substances across domains of farm, lab and clinic, we realize how intrinsically related these domains are.

Lesley A. Sharp (Barnard College, Columbia University): "Animal Research Unbound: The Messiness of the Moral"

Interspecies intimacy defines an inescapable reality of lab animal research. This talk is an effort to disentangle this reality's consequences—both in and outside the lab—as framed by the quandaries of ethnographic engagement.

Recent encounters with audiences outside labs provide an entry point for questioning how the "messiness of the moral" might facilitate an "unbounded" approach to lab animal worlds. Within the lab, one encounters specialized ethical principles—often codified as law—that delimit strict boundaries of in/appropriate human thought and action. These are evident in, for instance, mandates to number—and not name—non-human lab-based creatures. Such principles determine quotidian practices of "welfare" and "care" that, in peculiar ways, privilege animal health (as key to reliable data) while obscuring, erasing, or denying human forms of "self-care." In other words, they presuppose a regulatory ability to formulate, shape, and (re)direct human action. Yet attentiveness to the "messiness of the moral" of lab work exposes other realities: indeed, lab personnel regularly engage in a host of subversive responses that test or cross the boundaries of mandated behavior. These are not acts of sabotage; instead, they demonstrate creative moral thought-in-action that simultaneously exposes unspoken anxieties about lab animal work and staff efforts to (re)invigorate the meaning of "care" as interspecies responsibility. The ethnographer's ability to witness, record, and write about these actions within the lab rests comfortably on the relativist principle of suspended judgment. Once one moves outside the lab, however, wherein lies ethnographic responsibility, when one's accounts of the moral messiness of quotidian lab practices become unbounded and go public? I argue that multidimensional, interspecies framework of intersubjectivity (via Michael Jackson) could offer productive "unbounded" approaches simultaneously applicable to those based within and outside labs, and productive for the ethnographer, too.

Yvette Wijnandts (Maastricht University) "Thinking animals, thinking humans: how we encounter ourselves in our encounters with non-human animals"

Hegemonic Western thought always held the radical difference between the human and non-human animal as central to its understandings of the world. Up to this day, human-animal relationships are predominantly of instrumental nature. The main legitimization for the instrumentalization of non-human animal lives for human benefits is the belief that humans are reasonable beings, in contrast to non-human creatures. At the same time, while it is not hard to argue that animals are exploited, usually for capitalist benefits, many affective relations between human and non-human animals exist. Furthermore, animal welfare is widely institutionalized and regulated by national and international political bodies. In addition, within critical theory, the idea of the human as a fully rational being, in contrast to non-human animals, has been questioned and deconstructed extensively.

In other words, human and non-animal relationships are complex. This paper will explore this complexity by investigating how scientific research on animal welfare is influenced by many factors beyond the

animal itself. Conflicting Australian studies on kangaroo population and conservation will be used as a case study. I will look at studies that are the product of Rob Garnaut's proposal from 2008 to increase the national consumption of kangaroos in Australia. As kangaroos are Australia's beloved national symbols, there was resistance. Eating them was not only mean, but it would also change the Australian landscape by reducing kangaroo numbers. At the same time, supporters of Garnaut's proposal used the same arguments but argued that the result would be the opposite. Eating kangaroos would save the Australian landscape by reducing both cattle and kangaroo numbers.

What was striking about the debate is that both sides' arguments mirrored each other as conservationism was held as the main concern in the entire debate. In addition, both drew upon science validate their standpoint. More seemed to be at stake than the question of how to maintain the kangaroo population. This paper will examine how both sides used science to support their argument and the language used in the scientific reports. I aim to illustrate how scientific knowledge production about non-human animals is not only influenced by the animal that is central in the research but by existing human frameworks of values and truths too.