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"Skilled Care" and the Making of Good Science

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Abstract

This article investigates the construction of laboratory animal science as a version of "good science." In the 1950s, a transnational community of scientists initiated large-scale standardization of animals for biomedicine, which included the standardization of care of laboratory animals as well as the development of guidelines and regulations on laboratory animal use. The article traces these developments and investigates how the standardization work took part in enacting laboratory animals as compound objects of care—and laboratory animal science as being an intrinsically ethical practice—as *good science*. Importantly, the analysis shows how technological development is inextricably accompanied by ethics, as it is the result of complex social organization involving multiple ethical commitments. By investigating the development of laboratory animal science historically, it is possible to tease out how values, norms, and standards have been made integral to specific practices in the first place and how they have developed and been sustained over time. The article contributes to current concerns in science and technology studies about how life is made, valued, and ordered at the intersection of science and society and in biomedicine,

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including how certain values and positions of valuation come to count as authoritative and others not.

Keywords
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Introduction

In the book *Good Science,* which is about the stem cell controversy in the United States in the 2000s, Thompson (2013, 27) argues that most sciences and technologies have always had ethics as they are the results of complex social organization that involves competing ethical commitments. Sciences that have ethics do so as part of the disciplinary and bureaucratic activity that has increasingly become attached to biomedical and life sciences. The governance of ''good science'' involves what Thompson refers to as ''ethical choreography,'' that is, a maneuvering that enables science to mobilize ethics as entwined with multiple ends, such as robust science and technology and concerns for social issues such as health, welfare, justice, and prosperity (2013, 28). This complex choreography calls for empirical investigations of how the ethics of sciences are shaped in the first place and how ethics and values are negotiated at the science–society interface. In other words, how and why do (some) sciences become ''good''?

In this article, I will focus on a version of such good science, namely that of the transnational field of *laboratory animal science*. In the early 1950s, an international community of scientists initiated the standardization of animals for science, including the building of standard infrastructures of housing and the standardization of expertise and skills for the care and husbandry of laboratory animals. The standardization of *care* of laboratory animals was made a core concern, and the quality of the animal material became intrinsically linked to the skills of the animal caretakers and the quality and nature of the infrastructural housing arrangements. The article traces these developments by examining the practices of laboratory animal science and investigating how technological infrastructures and the development of skills in the care and husbandry of animals took part in enacting laboratory animals as compound objects of care—and laboratory animal science as being an intrinsically ethical practice—as *good science*.

For a laboratory animal ethics to emerge, be materialized, and be constituted in law, the value of science and technology also had to be negotiated in relation to the value of animals and humans. These negotiations took place largely in the science–society interface. The article contributes to current concerns in science and technology studies (STS) about how life is made, valued, and ordered in science and how certain values and positions of valuation come to count as imperative, and others not, in specific empirical and historical settings (Dussuage et al. 2015). The development and use of laboratory animals is particularly instructive as a case as it draws together issues regarding the *proper* ordering of human–animal relations with issues related to who gets to have a say in matters of care. The issue of animal experimentation is also a matter of great importance in the history of medicine, as it has been disputed as a reliable and appropriate method for knowledge production both inside the sciences and among the general public.

This article also shows that the standardization of laboratory animals and the emergence of laboratory animal science as a transnational discipline in the 1950s took part in settling controversies on laboratory animals by establishing animal experimentation as a reliable, efficient, and key method for ensuring human health and preventing the spread of epidemic diseases; the standardization of laboratory animals thus produced an ethics of laboratory animal science and consequently an ethical infrastructure for experimental medicine. Crucial to this process was the production of "new" standardized animals and the orientation of laboratory animal science around the development of skilled practices and infrastructures of care. Drawing upon the Norwegian instance of a wider international development, the article shows that much more has been at stake in controversies about the use of animals in biomedical science and discusses how this has consequences for how we think about values in the context of laboratory animal science.[1] More specifically, the article investigates how the emergence of a particular material-semiotic ethics of laboratory animal science took place both "inside" of science, with the development of standards, and at the science–society interface between scientists, animal welfare organizations, and animal rights activists. Laboratory animal science emerged, thereby, as a matter of care that was embedded in standards, technologies, and expertise.

Before moving on to the case in question, it is necessary to open up the concept of care—how it is mobilized in this article as an analytical resource and how it makes sense to talk about laboratory animal science as the practical choreography of different modes of caring and not as an enactment of a singular, calculative (scientific) mode of ordering.

Modes of Caring: Tools for Investigating the Emergence of Good Science

In the literature on laboratory animals in STS and the history of science, there is an agreement that an important shift occurred during the twentieth century in terms of the scientific engineering of animals as experimental models for medical investigations. The studies show how animals that are used in experiments are transformed, in the context of such experiments, from nature to tools or from being "naturalistic" animals to "analytic" objects (Lynch 1988). Some of these studies have suggested that the *system* of experimental medicine in itself takes part in enacting such transformations (Phillips 1994; Logan 2002; Birke, Arluke, and Michael 2007), in other words, that outside of science animals are treated as biological nature, but inside of science nature become whisked away and the animal is rendered a machine-like tool. The naturalistic animal can also appear in the scientific context, albeit only by slippage and if outside norms are allowed to interfere. Central to these descriptions is that the act of transforming animals to tools—or the very constitution of animals as tools—involves not only the whisking away of nature but also animals' moral status or possibilities for moral relations.

But is this the case? More recent studies of laboratory animals show how these creatures are in fact highly valued, even though the valuation of animals is based on the successful choreography of a range of different concerns, including concerns for the workability of animals as tools *and* concerns for animal welfare and integrity (Tresselt 2011; Asdal and Druglitrø 2016; Pihl 2016). The point is that the instrumental use of animals is also a means of including animals in the biopolitical collective and that it is *in relation* that animals (and humans) are ascribed value. This might sound crude, as it suggests that animals or humans do not have values in and of themselves. But as is well known within STS, nothing has value in and of itself, or, to quote Dussuage et al. (2015, 5), "values should not be seen as intrinsic properties of objects, peoples or cultures." Haraway (2008) has also pointed out that instrumental "relations" between humans and animals produce complex moralities, rather than being void of moralities.[2]

Approaching instrumentality and technologies in this way when exploring the emergence of a laboratory animal ethics also invites a more open approach to the values that have been part of constituting laboratory animal science as good science. Studies of care in STS and medical anthropology are also useful here for many of the same reasons, as they have shown how medical practices and practices of care enact and depend

upon the constant coordination of multiple *logics* or *modes of caring* (Mol 2002; Pols and Moser 2009; Law 2010; Mol, Moser, and Pols 2010; Moser 2011). The standardization of laboratory animals depended as much on infrastructures, efficient organization of work, and technical *and* affectionate skills, as it depended on the management of a multitude of concerns including scientific quality, animal health, and killing with care.

Thus, caring for the laboratory animal in the scientific mode involved constant work to keep different modes of caring together. This will be explored in the first part of the paper by drawing upon developments in Norway. More specifically, I base the analysis on activities at the newly established animal house at the National Institute of Public Health (from now on referred to as the NIPH) in 1960 in Oslo, Norway. The animal house was built to produce and house laboratory animals and particularly specific pathogen-free (SPF) animals. The NIPH was established as a national center for the production and distribution of laboratory animals as well as for developing competence and skills in relation to the care and housing of laboratory animals. I show that it is in the interface between care and technology, and between affectionate and technical relations, that the standardized laboratory animal emerged as an object of care, and that an ethics of laboratory animal science was formed.

In the early 1970s, the scientific mode of caring was challenged by animal rights activists who mobilized an alternative mode of caring. While the scientific mode of caring was embedded in practices, skills, and infrastructures, and in animal technicians, the *animal rights mode of caring* involved a critique of new technological infrastructures in agriculture and in science. Animal rights advocates argued that technologies were responsible for separating humans from animals. As a response to the major changes in animal husbandry and use, they called for a "logic of the heart" in the management of animals that involved taking the animal's point of view into account. The logic of the heart was a means to reckon with the "logic of reason" that was according to animal rights advocates guiding scientists as well as politicians on the issue of animal protection and care and that was leaving out any room for affections. The developments both in science and in the animal rights movement were not specific to Norway but were a Norwegian version of a wider transnational development (see Druglitrø and Kirk 2014).

By investigating the social and scientific development of laboratory animal science *historically*, the analysis contributes to STS by teasing out how values, norms, and standards have been made integral to specific

practices in the first place and how they have developed and been sustained over time. Historical studies may also be seen as particularly sensitive to how some versions of "the good" are sustained over time and some are not (Asdal 2014, 311). The historical analysis is based on textual materials: bulletins, journal articles, books, letters, notes, and newspaper articles. In effect, the textual material makes up the field in which it is possible to trace actors, words, and practices and to understand how objects are enacted over time. Thus, texts provide a means for tracking the emergence, negotiation, and constitution of the materiality and semiotics of care across different times and modes of caring.

Scientific Mode of Caring

Producing Compound Objects of Care

Until the 1950s, most Norwegian scientists procured animals from random sources, and most often the breeders producing animals for the laboratory did not have any insight into the needs of biomedical science. This led to continuous complaints from scientists about the animals being bad models and that animal disease hampered the results of the experiments. In addition to the risks of producing unreliable science, scientists argued that it was both costly and impractical to continuously replace useless or dead animals. A shift occurred transnationally in the 1950s, however, toward the production and use of standardized animals. The great value of knowing different characteristics of the animals that were being used in experiments—such as their disease history, gender, genetic and pathogenic composition, and so forth—was emphasized and made into a criterion for using animals in the first place. The "new" SPF animals were produced according to specific hygienic criteria with clearly defined pathogenic compositions. The value of these animals (mostly standardized mice and rats) was also that they were almost identical in composition and thus could be used with a high turnover (see Kirk 2010, for more on "gnotobiotic technology"; see also Rader 2004, for the US history on the genetic standardization of mice; Kirk 2005, for the UK history). As the diagnosis of diseases and the testing and production of vaccines were central tasks at the NIPH in Oslo, initiatives were created to facilitate the introduction of these new animals with the ambition to enable a national production and distribution of laboratory animals to ensure a reliable and predictable access to research materials for the medical community. According to veterinarian Helge Stormorken (1960),

> In all sciences one is continuously trying to improve the methods for investigation. But the basis on which the results of these methods rest, in this case the laboratory animal, is given little or no attention.

In 1960, a brand new animal house was finished at the NIPH, "built according to modern standards" (Lerche 1962, 423), and ready to house standardized and purpose-bred animals. Nearly seven years passed from the time different scientists approached the governmental authorities and the Research Council of Norway to get funding to establish an animal production center and the time at which the new animal house was realized. During this period, the scientists were able to build consensus in the scientific community and in the public administration on the importance of the laboratory animal for the success and progress of the medical sciences.

The introduction of standard animals involved establishing distinctions between good, "less good," and "bad" laboratory animals. Good animals equaled "disease-free" animals, or animals with clearly defined pathogenic composition, less good ("conventional") animals contained degrees of contamination from pathogens but were bred according to genetic principles, and bad animals were those that were of unknown origin and/or diseased (Erichsen 1975b). Good and less good animals were the results not only of economic investments (the new production methods involved a considerable rise in costs, and parts of the research community had to be thoroughly convinced that these investments would pay off) but also of technical and physical investments in terms of standardized infrastructures and the training of skilled personnel. Laboratory animals were transformed into a commodity in a different way than before, as they could now be offered as standards according to particular quality criteria. As noted by the veterinarian Stian Erichsen, the head of the house,

> Laboratory animals cost money as all other goods. The price the users have to pay for the animals is naturally linked to many factors, such as the cost of production (feed, grit, work force, cages, housing and so forth). (Erichsen 1967)

The changes that followed the establishment of laboratory animal science from the 1950s thus transformed laboratory animals from being mere animals to objects that were meticulously measured in terms of disease, health status, and performance and that were very much situated within and products of science. This shift thus also involved a shift in the valuing of laboratory animals. The new animals can be described as *compound objects*

of care, as they were treated both as technology and biology, in other words, as being part of scientific infrastructures but also at the same time part of a biological species. This complex, it was argued, required specific forms of care, performed by specific persons, with specific skills; it required what they called "skilled care" [kyndig stell]. What kind of care is "skilled care?" As we shall see in the following, care practices were oriented around the capacity to coordinate between caring for animals as biological beings and scientific tools and caring for the scientific system as a whole. While laboratory animals can be said to have been the "main" objects of the care around which the infrastructures were built, the animals were situated in a network of other elements that needed to be cared for, such as the organization of work, the proper management of technologies, the economy of animal use, timing, and the quality and reliability of science.

Care as a Professional Skill: Knowing the Standards

The in-house bulletin of the animal house at the NIPH provides insight into the daily practices of the animal house. Stian Erichsen was the editor of the bulletin and used it actively to spread news on developments in laboratory animal science and on the challenges of housing animals in specifically defined, hygienic environments. Much emphasis was placed on the organization and practices of animal care. Erichsen identified the personnel of the animal house as crucial to its abilities to offer good laboratory animals. The organization of the animal house required that the staff behaved according to special rules. In-house rules were distributed to the personnel under the heading "Instructions for the Stable" (*Stallinstruks*). An unfortunate incident of disease outbreak in the animal stocks at the animal house in 1960 is a case in point. Erichsen wrote about the outbreak in the bulletin and turned it into an illustrative example of the challenges of laboratory animal care, emphasizing the continuous focus on discipline:

> We have now experienced the full utility and necessity of the constant surveillance of the animals and their health. Disease and mortality must be accounted for and reported on a daily basis, like we did during this epizooty. Only then is it possible to intervene in time. (Erichsen 1961b)

Erichsen had also previously pointed out that "many of the practical and theoretical problems that occur in relation to the work in the animal house can only be solved by tinkering" (Erichsen 1961a). The outbreak had necessitated the slaughter of around 500 mice, which had significant

economic and practical implications for the scientific activities at the institute. According to Erichsen, the epizooty had entered the animal house with mice bought from a Norwegian breeder. The Norwegian mice had carried a latent infection that quickly became a disease when they were housed with Danish mice. In contrast to the Norwegian mice, the Danish mice had been bred under highly controlled hygienic conditions, which led Erichsen and his team to conclude that the disease was not likely to have come from overseas. Erichsen explained that they had been able to trace the disease to the Norwegian animals by doing experimental work: as more and more animals had developed lesions and gangrene on their back feet, and after several of the mice had died, the team decided to slaughter the animals that were visibly ill and perform histological investigations of the infected areas. By doing so, they found that the mice had developed ectromelia, which was known as mouse pox and was said to emerge only among mice kept for research purposes. After conducting several tests, the team confirmed that the disease had come from the Norwegian breeder, which was instantly put on a blacklist of unreliable producers. Erichsen decided that mice would only be imported from the Danish source to ensure the import of purpose-bred animals that had been closely monitored from before birth to shipment.

But how were they to avoid that such incidents happened again? First, the incident showed that with the new standardized animals, there was a need for "meticulous accuracy on hygiene," Erichsen wrote in the in-house bulletin (Erichsen 1961b, 4). He continued to point out that the new animals were more sensitive than conventional laboratory animals, as their lack of exposure to germs, virus, and bacteria meant that they would be more susceptible than conventional animals. Second, more attention had to be paid to the technical arrangements of the animal house. The epizootic incident had caused serious challenges in terms of delivering sufficient numbers of animals to users in time. Erichsen (1962) wrote that

> [a]lterations in nutrition and care have been executed in order to deal with the challenges of animal mortality, but without any luck. The only way to circumvent the losses so far has been to oversize the [animal stocks] housed so that the laboratories would be supplied with a sufficient number of mice and pregnant females.

Nevertheless, paying close attention to the animals was important in order to ensure that the animals were not stressed, as stress was seen as a potential trigger of the much-feared latent infections that could reside or be provoked in animal stocks (Erichsen 1962). Taking care of laboratory animals

depended on abilities to *see skillfully*. That is, laboratory animals had to be handled with a scientifically informed gaze and dexterity. The importance of skills was thrown into relief by referring to the practice of appointing "unskilled persons" to the caring for laboratory animals. A veterinarian engaged in the emerging field of laboratory animal science stated that "[t]his is no longer a place for people who are unsuitable for everything else" (Stormorken 1960, 3). Previously, the unskilled animal *caretaker* had not been regarded as part of the research team. Now the tasks of the caretakers were seen as integral to science production, hence the change of name from caretaker to *technician*. Professionalizing care was thought to stimulate greater interest in the work assignments and, consequently, an appreciation of the process of science production.[3] In a letter to the Research Council of Norway about the funding of animal technician positions, Erichsen emphasized their important role in science production, arguing,

> [w]ith regard to personnel the medical laboratories have something in common—namely that a large part of the daily work, whether routine or scientific in nature, is performed by technical personnel. The work structure of the laboratory presumes that the personnel is so highly skilled that the individual laboratory technician independently can perform tasks that will directly lead to results that the laboratory can base [its work] on. (Erichsen 1971)

The change of name from animal caretaker to animal technician reflects the changing responsibilities and requirements linked to the position of caring for and managing laboratory animals and emphasizes how the requisite skills involved a technical feature. When regarded as central to animal care work, the practical and technical aspects of managing disease in animal stocks were emphasized as the professional content of laboratory animal care work. Interestingly, as the care work became more clearly defined and standardized, the word "care" disappeared and was replaced by "technician." While the change of title was meant to signal the position's place on a professional career path and its scientific weight, it must also be seen as intrinsically linked to the transformation of laboratory animals from ordinary animals to valuable objects that depended on particular modes of caring. The job of the animal technicians was to hold different modes of caring together. Caring for laboratory animals was as such not "reduced" to being about "tender love" but was rather about managing and coordinating

assemblages of people, animals, germs, and technologies and a range of different goods.

Care as Affective and Responsive Work

Skillfulness depended not only on technical skills but also on one's ability to engage with the animals affectionately. "Much is dependent on the interest and perception of the staff," Erichsen (1961b, 5) wrote in the in-house bulletin when discussing how to tackle epizootic outbreaks and to ensure the health of the animals. The animal technicians were expected not only to be managers of different technologies but also, through meticulous attention and perception, to be able to ascertain when the animal was healthy and when it was not. Thus, in defining the new position of animal caretakers, emphasis was placed not only on the technical skills of the people that were to be employed in these positions, but also on their holding a certain aptitude for and interest in animals. Candidates for animal technician jobs were preferred who had both experience with and affection for animals. Job ads for "skilled personnel" in Norwegian newspapers and scientific journals emphasized interest in and care for animals. Not only should they cover one or several criteria, such as insight into various scientific disciplines as pointed out above, but the person employed should, as one of the calls read, be someone who "cares about animals and has a good sense of order, accuracy and hygiene."[4] To be "skilled" (*kyndig*) in the context of laboratory animal care thus involved managing particular technical-affective tasks in the animal house that were directed at different but somewhat overlapping concerns.

For instance, a central part of the job of the animal technician was to *index* the animals. Indexing involved filling out information about the animal provider, date of delivery, and sex and age of the animals in each cage. Animal technicians also created information on the number of animals that had died, the date of detection, the number of disposed animals (i.e., animals used in experiments, breeding, and sale), what they had been disposed for, and where the animals had been shipped; all information was to be recorded on the index cards and attached to the respective cages. Meticulous indexing of deaths and the causes of death placed the focus on deficiencies in handling, feeding, and/or disease control and was partially directed at improving the care and management of laboratory animals (Erichsen 1961c). The indexing exemplifies how the personnel were expected to know all details of each individual animal and their life cycles and disease histories. Further, while indexing, the personnel could control

any changes in the animals' fur, weight, and temper. The mundane and routine practice of indexing thus involved seeing, knowing, and feeling the animal and translating these observations to fit the prearranged boxes of index cards.[5] The standard of *skilled care* emerged, then, not only as a practice involving the handling and coordination of various technologies, people, and animals, but also as a practice that demanded affective (embodied) investments of various kinds.

Skilled Care as Animal Protection and Good Science Combined

When the issue of laboratory animal care was raised as part of the plans for the establishment of the modern animal house at the NIPH in the 1950s, the moral value of animals was not part of the discussion. In other words, the issue of care was not initially framed according to specific animal ethics but rather oriented around practical challenges linked to the production, housing, and use of laboratory animals. Thus, skilled care and the quality of laboratory animal production were initially linked to the value and necessity of producing good standards, not as a way to take better care of laboratory animals as such. A central concern was how care could ensure an economically sound, efficient, and reliable infrastructure for biomedical science. But the involvement of veterinarians in the planning of the animal house at the NIPH helped frame the issue of laboratory animals by a specific animal protection logic. Many veterinarians in Norway were members of the Norwegian Society for the Protection of Animals (*Foreningen til Dyrenes Beskyttelse*, henceforth, NSPA). The NSPA had been involved in the issue of laboratory animals since the early 1950s. In 1951, the NSPA established a laboratory animal committee whose charge was to include veterinary authorities in controlling the use of laboratory animals[6] and to establish organized training and education for animal caretakers. The development of laboratory animal science can be investigated as part of the history of the veterinary profession and how it has increasingly become involved in and relevant for biomedical practices.[7] Nevertheless, a core concern in veterinary care was said to be to combine animal protection with practices of disease prevention and treatment. Given that much of the care for laboratory animals was oriented around the prevention of disease and the management of standards of health, laboratory animal science seemed to fit perfectly in a veterinary logic.

The NSPA committee aimed to "raise the common interest for and knowledge of the living conditions of laboratory animals." The committee stated that instead of taking on an abolitionist view of animals in science,

they wanted to focus on how to improve the lives of the animals *in practice* and *in use*. They characterized this as an "appropriate or more user-friendly animal protection" (Wirstad 1960, 55). A key component for ensuring "appropriate animal protection" was more actively including *veterinary expertise* and *knowledge* in the care and use of laboratory animals. In doing this, they claimed, they would serve the ethical concerns of using animals in science "in an outstanding manner" (Wirstad 1960), as the usual worries linked to animal cruelty and mistreatment—such as improper feed, lack of sufficient housing, or poor hygiene—were addressed by this mode of caring. The demand for animal protection as proposed by the NSPA was advocated as "completely in line with the demands of science of well-defined experimental conditions, the possibilities for replicating experimental results, etc." (Koldberg 1960, 49). This particular framing was to become important some years later when the scientific mode of caring was challenged by animal rights activists in the 1970s. It was also important, as processes were initiated in the same period to develop a new Animal Protection Act (1974) and the first Animal Experimentation Directive (1977) in Norway that mobilized animal activists on the issue of animal experimentation. A controversy emerged over how to best ensure animal well-being and what kind of people should have a say in matters of laboratory animal care.

Animal Rights Mode of Caring

Care as Logic of the Heart

In the early 1970s, the animal rights community repeatedly accused scientists of working behind closed doors. The accusations were put forth in mainly newspapers, but they were also expressed at public demonstrations and in published books. The animal rights advocates described a situation in which the public was closed off from the laboratory and that this was because of the many "barbaric" experiments that took place there. Their claim was that if the public knew about the real nature of many of the experiments they would never be accepted, even if their aim was to ensure good health. In 1972, the newly established initiative Action for Animal Rights (*Rettighetsaksjonen for dyr*) issued a Declaration on Animal Rights based on the United Nations (UN) Declaration of Human Rights. The 1972 declaration stated that all animals had intrinsic value and that animals had a right to realize "individual biological needs for positive self-expression." More specifically, the declaration pointed to the rights of animals not to be exploited in practices that would cause suffering. In this case, animal

experimentation was described as "legalized animal mistreatment." The animal rights mode of caring was concerned with replacing what was described as the scientists' and governmental officials' "single-minded logic of reason" with a "logic of the heart" (Knutsen 1974, 178). The rapid technological turnover in agriculture, science, and other parts of society was regarded as a threat to interpersonal and, not least, interspecies relations (Knutsen 1974, 178): "Is it possible to turn around this tragic development? Is it possible today to place more emphasis on the enlightening of the heart?" The core concern for the animal rights advocates was that the new technoscientific regimes were incommensurable with real care. Hence, while scientists were deeply concerned with attaching morality to instrumentality, the rights advocates saw it as necessary to separate them in order to care for animals in a proper way. Real care was only to be found in the heart and not by pure logics of reason (and/or technological innovation).

Ending the Controversy: The Role of Infrastructures and Expertise

The establishment of laboratory animal science as good science in public was central to ending the controversy. To balance accusations from the animal rights advocates, Erichsen and others who were invested in animal experimentation found it even more pressing to organize the activities at the animal house in a manner that was consistent with the logic of good science. In order to do this, they had to mobilize the range of elements that were tied to their claim of laboratory animal science as an intrinsically ethically oriented practice. Erichsen's strategy was to open up the animal house and to address head-on the ethical issues raised by animal rights advocates. He did so by publishing a five-page article in the journal of the *Research Council of Norway* titled "Laboratory Animals Are a Necessary Part of Our Way of Life" (Forsøksdyrene er nødvendige for vår livsform, 1975a). The article was accompanied by a photo of Erichsen in the animal house, placed in front of the row of animal cages in his white scientist coat and holding a rabbit—looking very little like a barbaric scientist and more like a responsible expert. The article was also supplemented by other photos from the laboratory, including someone draining blood from a rabbit and another person experimenting on a dead rat. In the article, Erichsen pragmatically emphasized that he respected and understood what he called the "vegetarian standpoint" but that it presented an "unrealistic" standpoint if one was to maintain contemporary ways of living. He continued to point out that

> the consequences would be enormous if we were to stop experimentation on animals. Generally speaking, we would have to accept a return to the "old days" with disease, disability, and death far earlier in life than what we are used to today and have come to take for granted. (1975a, 3)

Where the animal rights advocates identified a tension in the scientific mode—that is an almost incommensurable pull between animal protection *and* animal use—the scientists regarded the welfare of animals and human use of animals as complementary: using animals in medical experiments was a *natural* continuation of the human use of natural resources, Erichsen (1975a) stated. As long as these resources were used in a responsible manner, it was not a bad practice in itself. Rather, it served several beneficial aims such as ensuring human health, animal welfare, and the prosperity of the nation at large.

Erichsen followed the same line of reasoning as proposed by the NSPA: laboratory animal science was intrinsically concerned with arranging a "sound union of economy and morals" (1975a, 4), as it paralleled concerns with scientific quality, economic sustainability, and ethical aspects of animal use. He aligned the protection of animals with a particular form of care, namely skilled care, and as such performed laboratory animal science as *good*. Not only was skilled care an essential means for ensuring good science, but it was also a means for ensuring human health and animal well-being *together*. Interestingly, the emphasis on the *interdependency* of humans and animals was characteristic of both modes of caring, though in very different ways. The Action for Animal Rights argued that acknowledging that animals had intrinsic value, and caring for individual animals and their right to a life free of strains, would benefit the society as a whole. In contrast, the scientists and the more moderate NSPA argued that in order to care for society and to have a better world, the use of (and sometimes infliction of pain on) individual animals was necessary, even indispensable. In the scientific mode of caring, animal rights perspectives were performed as bad and even dangerous, as they were seen to be *solely based on* emotional considerations.

The controversy over laboratory animals as it unfolded in this period took part in constituting what was and what should be strived for as good. This was also reflected in the Animal Protection Act and in the Animal Experimentation Directive, as it allowed for the continuation and expansion of laboratory animal use, though within certain limits, such as ensuring that a concern for the unnecessary suffering of animals was taken into account when designing experiments and that the animals were cared for by skilled

personnel with veterinary training (Animal Protection Act 1974; Directive on Animal Experimentation 1977). In legal texts, the framing of animal use was similar to what Erichsen conveyed in the 1975(a) article: the production systems in which animals are situated today, the law read, could be regarded as a natural development in the human use of animals, and as such the strains placed on the animals were not necessarily that bad. The Law Committee for the Animal Protection Act wrote that

> as long as we do not know how the deprivation of freedom affects the animal, the Ministry believes that the task of the Animal Protection Act is to make sure that the animals live their lives in line with their natural needs, as far as it is practically and economically possible. (Asdal and Druglitrø 2016, 78)

The rationale in the Animal Protection Act was that laboratory animals were products of the laboratory, and as such it was the laboratory that made up their natural environments. However, the new act and directive did not free scientists and the laboratory from outside control. The directive called for the establishment of an Animal Experimentation Council (*Forsøksdyrutvalget*) that was to work as a control organ and "witness" on behalf of the public that animal experimentation was conducted according to agreed-upon norms. The two most important tasks of the council were to authorize individuals experimenting on animals and manage, approve, or reject applications for conducting *painful* experiments on animals. As the council was meant to function as a "control organ," its composition became a central concern for the different stakeholders. The guidelines for the council indicated that it should be made up of six members: two veterinarians, two medical doctors, and one lawyer—all of whom were to be skilled in regard to both animal protection and scientific work—as well as a representative from one of the animal advocacy organizations, given the major interest and investment of animal protection and animal rights advocates in the issue of ethical control of the practice. Thus, in ending the controversy, opposing claims were not silenced, though it is possible to argue that the council, as an infrastructure for carrying out good science, only really allowed for one specific mode of caring, namely, the scientific one. Still, the composition of the council reflected the general recognition of animal experimentation as a practice with widespread moral concerns that needed to be taken into account and respected, and as such was a political technology that managed to coordinate overlapping and conflicting modes of caring for animals.

A Matter of Care?

The laboratory animals that increasingly have come to traverse animal houses and laboratories across the globe are indeed technologies and tools, though they are technologies that depend on specific forms of care and on specific forms of affective relations. As such, the nonessentialist approach suggested by care studies helps us to dissolve the binary opposition between—indeed the very categories of—technology and nature, instrumentality and care. By identifying the compound aspects of laboratory animals, their peculiarities as objects of care, *and* the specificities of the modes of caring for laboratory animals, we are also better equipped to make critical interventions on matters of care (as suggested by Haraway 2008; Bellacasa 2011). And there is certainly a need for further humanities and social scientific research into the field of laboratory animal science and welfare. Ethnographic studies, such as Holmberg (2011) and Davies (2012), have already alerted us to how caring for engineered laboratory animals is becoming progressively challenging, both because of the scale of the enterprise and because of the difficulties in knowing the standards. As Davies (2012, 633) states, ''the potential for shared suffering fits uneasily within large commercial mouse houses . . . in which animal care is increasingly as routinised as the standardised animal housing.'' Even though laboratory animal science has from the start been shaped as good science, science continues to push the limits of what constitutes a good animal model and what these models in fact could and should do. That, I would argue, strains the content of good science. Hence, to talk about care in this context is in some ways provocative. Tracing the emergence of care and ethics historically might, however, be one form of ethico-political intervention, as it alerts us to how values have been negotiated and sustained in laboratory animal care specifically and biomedicine in general. This enables us to identify points of tension integral to the formation of such practices.

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Notes

1. The article draws upon insights and empirical data developed for my PhD thesis on the history of laboratory animal science in Norway from the 1950s to the 1980s. See Druglitrø 2012.
2. In an ethnographic study of animal technicians, Tresselt (2011) has argued that the very use of the laboratory animal gave the animal value and identity. This was not only because they were convinced that the use of the animals could have wider positive effects—such as that of ensuring human health and welfare—but also because the animals were enabled to express their ''labness.'' Through use, the animal technicians helped the animals to fulfill the meaning of their lives: ''It is its job to be a research animal and to produce data,'' one of the technicians told Tresselt in an interview. When Tresselt asked if the animal technicians regarded the laboratory animals as different from pet animals, for instance, several said that it was a significant difference since the situation the animals were placed in defined their purpose and meaning. In the context of the animal house, the technicians saw it as their primary task to make the animals feel comfortable so that they could establish work relations with them, that is, to make sure that the animals cooperated and that they were healthy and reproduced ''normally.''
3. Formal training courses for laboratory animal technicians were not established until the late 1970s. Thus, training technicians in laboratory animal care depended on in-house training, and many of the other laboratories in the Oslo area sent their technicians to the National Institute of Public Health or to animal houses abroad so that they could acquire the necessary skills. From the late 1950s, however, formal criteria for laboratory animal technicians had been developed internationally and distributed nationally by the International Council for Laboratory Animals and the national members. These criteria included the need for laboratory animal caretakers to have knowledge about certain aspects of biology, genetics, nutrition, and the etiology of disease (Druglitrø and Kirk 2014).
4. In Verdens Gang, July 11, 1975, p. 26. Vacancies were also listed in Verdens Gang on April 13, 1976; September 1, 1977; December 20, 1977; and January 9, 1979.
5. As Holmberg (2008, 332) puts it, in many animal experimentation practices, there is a need for a ''feeling for the animal,'' which involves both knowledge

of the species specificities of the animal and the ability to respond to individual animal needs.

6. Since in the 1950s this control was carried out by medical doctors and enforced by the Ministry of Health, veterinarians previously had not been included in issues concerning laboratory animal protection.
7. Dirke (2000, 81-82) has pointed out how veterinarians in Sweden have used animal welfare organizations as a platform to promote and expand veterinary expertise. Much of the same can be identified in a Norwegian context.

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