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Experimental Transactions: Science and the Human-Animal Boundary

On Tuesday 24 June 2008, an interdisciplinary audience gathered for the fifth Workshop of the Centre for the History of Medicine and Disease on *Experimental Transactions: Science and the Human-Animal Boundary.* The one-day workshop, organised by Stephanie Eichberg, offered an interesting array of papers, with subjects ranging from the mid 17th century to contemporary issues. The main focus was on the problem of the human-animal-analogy in the biomedical sciences and on the historical and institutional context of the laboratory animal. The workshop was held at the Wolfson Research Institute, Queens Campus, and was sponsored by the Wellcome Trust.

The first paper was given by MASSIMO PETROZZI (Johns Hopkins University) on *Inside and Outside the Laboratory: Animals, Humans and Blood Transfusion, 1666-1668.* Petrozzi addressed the changing perceptions of animals by experimental scientists during the 17th century by focussing on how experimental results were informed by the animalsâ natural behaviour outside the laboratory. Drawing on a wide range of examples, including Robert Boyleâs and the Royal Societyâs experiments on blood transfusion, Petrozzi argued that, for a thorough understanding of animal experimentation at that time, it was vital to examine the relationship between the experimenter and his animal-subject both inside and outside the laboratory.

That this framework is not universally applicable to the various kinds of experiments on animals performed during the 17th century was the starting point for the discussion following Petrozziâs presentation. The 17th century saw a wide range of very invasive experiments, of which Robert Hookeâs experiments on artificial respiration and those of William Harvey on the circulation of the blood are among the best known. But, although vivisection has received a great amount of attention by historians and admittedly was an important part of the animal-experimentalist culture, it was by far not the only or even the most important aspect of it. During the classical period, questions were raised by experimenters regarding new methods that allowed a different approach to the study of living beings and would result in a better understanding of human physiology. A major question dealt with the search for the best laboratory animal for a given experiment. Petrozzi suggested that practicality was the major factor involved in the choice of animals. Sheep, for instance, were readily available and commonly thought of as calm animals, and therefore highly useful in experiments such as blood transfusion. Another question addressed the scientific approach of the discussed experiments, as seen from the perspective of the 21st century, where replicability and standardisation of the animal-subject are of the utmost importance. Petrozzi argued that those factors did matter in the 17th century as well. Experimental results were certainly tested and replicated in various places, as an active exchange of letters between experimenters suggests. References regarding the preservation or alteration of the animalâs natural state, as observed after the experiment, could be easily understood and interpreted by fellow experimenters on

the grounds of common experience outside the laboratory. Therefore, it was deemed important to stress that, as opposed to 21st-century science, it would be impossible to understand animal experimentation without reference to the perception of the animal outside the laboratory during the 17th century.

In the second paper, *Constituting the Human via the Animal: Albrecht von Hallerâs (1708-1777) âSensibilityâ Trials*, STEPHANIE EICHBERG (Durham University) discussed the dual nature of Hallerâs concept of animal *sensibility* vs. human *sensation*. She showed that concepts associated with the functions of the nervous system remained flexible in Hallerâs research just as much as the handling of the species boundaries during the experiment. For instance was Hallerâs theoretical understanding of human sensation influenced by a contemporary belief in the soul as the prime agent of bodily functions, whereas in the soulless animal sensibility could only be assessed by measuring bodily pain.

A main point of the discussion was whether the concepts of *sensibility* in animals and *sensation* in humans bore any reference to the notion of the *Great Chain of Being*. The *Chain of Being* had been a major concept not only during the time Haller conducted his experiments and therefore must have had at least some influence on his theoretical thinking. The problem, however, lies in tracing Hallerâs individual notion and understanding of the *Chain of Being*. Was it a more materialistic one, focussing on morphological traits and thus characterising similarity or dissimilarity between the species; or was it based on an immaterial concept, assuming a connective force that runs through an alleged chain, thus sustaining its integrity? Eichberg answered that it is nearly impossible to tell whether Hallerâs notion was informed by mechanist, vitalist, or an animist concepts. On the one hand he seemed to have applied mechanistic notions to his experimental research; but, when it came to his theoretical assumptions, he usually switched to concepts of the soul and/or the mind as vital for the function of sensibility. Especially the notions of soul and mind led to interesting discussions about the animal soul in the 18th century. Eichberg pointed out that mind and soul were used interchangeably, especially with regard to humans, thus the discussion was lacking the strong religious connotations normally associated with the soul. The concepts of soul and mind were rather used to describe and distinguish mental functions such as emotions and consciousness. Secondly, she argued that it would be valuable to elaborate the concept of *bodily* soul which was thought to be shared by animals and humans alike. Its properties could be analysed in animal experiments to investigate bodily functions and at the same time maintain the distinction between animals and humans. In general, Haller himself did not elaborate in detail about the differences between humans and animals. For him the similarity in structure was enough to assume a similarity in function.

The next speaker, FRANK-WALTER STAHNISCH (University of Calgary) talked about *19th Century French Physiology and the Conception of the Human-Animal Analogy: The Case of FranÃ§ois Magendie (1783-1855) and Claude Bernard (1813-1878)*. Stahnisch suggested that matters of locality and practicality as well as the context-dependent choice of the ârightâ animal had an important influence on the production of physiological knowledge. He demonstrated that the human-animal relationship was equally variable, depending on the experimenterâs research conditions. The discussion picked up on the question about what Magendie and Bernard, who were experimental physiologists of two consecutive generations, understood under the term *analogy* and how they used it. The use of analogies as explanatory aids has a long history, but its foundations lie in the shared values of the scientific communities in question â be it the shared experiences in the laboratory, the similar training and use of the same textbooks, or shared disciplinary objectives. Stahnisch remarked that there had been two uses of the concept of analogy in the medical context of the mid 19th century. Firstly, analogy was used as a means of transferring phenomena from one species to another. However, this was usually limited to clinical environments, where it referred to the conceptual transfer of symptoms between patients in order to arrive at a diagnosis. The other meaning focused on conclusions by analogy regarding bodily functions, which were derived from investigations conducted on different animals. These conclusions by analogy were used to obtain a fuller picture about the respective bodily function. Another question was whether pragmatism, both regarding locality and practicality, really was the dominant reason behind the choice of an animal-subject. This is especially relevant since todayâs animal experimentation seems to focus on a few privileged species, like guinea pigs, mice, or rats. Stahnisch argued that the question, which animal would be the best choice for a given experiment, was very much part of the discussion within the experimental discourse. But it was also one of the major problems. On the one hand, there was the rational approach, which could involve obtaining external advice on the best animal for an experiment. But this ideal choice was often not read-

ily available or its acquisition involved major difficulties. Therefore, proxies were needed as substitutes. Similar to Petrozzi, Stahnisch stressed that the apparent flexibility of experimenters in their animal choice was not voluntary, but rather a means to an end. The rational way of circumventing the lack of the rational option was to revert to pragmatism. Thus, as Stahnisch suggested, the pragmatic factor remained the most important one.

How the aforementioned relationship between experimenter and laboratory animal had changed in the 20th century was the basis for ROBERT KIRKâs (University of Manchester) paper on *A Chance Observation: Ethological Approaches to Laboratory Animals and Human Health c. 1945-1969*. Based on the papers of the pharmacologist Michael Robin Alexander Chance, Kirk showed how ethological considerations and the individual relationship between experimenter and animal restored the status of the laboratory animal as an agent mediating knowledge, and as an individual being. The result was a better understanding of laboratory animals both in the context of the laboratory and in relation to the experimenter.

The discussion elaborated on the extent of the relational change in an understanding of the animal in its different experimental contexts. The experimenter, as an ideally objective observer, was determinedly non-interventionist, and thus should have remained unaffected by the animal itself. But, as it was remarked, the change Kirk was describing rather looked like a further step towards developing what Michael Lynch has called the *analytical animal*. This was another way of objectifying the animal, this time with regard to its behaviour which became increasingly abstracted from the animal as a living being. Although Kirk generally agreed with this point, he emphasised that Chance, whilst certainly objectifying the animal, did take the animal into account as a living being and individual. Chance did not view it, as had been done during the 18th- and 19th centuries, as a kind of convenient, yet sophisticated but anonymous knowledge generator.

How far an individual behavioural analysis of laboratory animals reached was demonstrated by EDMUND RAMSDENâs (Exeter University, London School of Economics) presentation *Experimental Methods in Social and Behavioural Psychology: Travelling Facts in Human and Animal Experiments in Overcrowding*. Referring to the animal ecologist John B. Calhoun, Ramsden showed how knowledge about rodent behaviour in the laboratory âtravelledâ on to an evaluation of urban settlements and human society. Calhounâs research thus crossed not only species boundaries but also disciplinary boundaries, and had a major impact on social scientists and environmental psychologists during the second half of the 20th century.

The discussion at first reflected on the surprising speed by which the results of Calhounâs experiments crossed these disciplinary boundaries. Calhoun published his articles in journals with a broad readership, thus ensuring a quick dissemination of his ideas. At the same time, there has been a shift in popular culture towards a new form of science fiction, i.e. the science fiction of everyday life, with an enormous amount of literature being published on apocalyptic scenarios dealing with overcrowding and increased stress in human urban settlements. Thus, there was a huge amount of attention both from the public as well as the professional sphere for Calhounâs research.

A more specific question addressed the anthropomorphic language in which Calhoun published his work. In direct comparison to the work of other scientists concerned with behavioural studies, such as Nikolaas Tinbergen, it becomes quite clear that the general tendency was to adopt a more serious tone and to avoid anthropomorphism. Ramsden remarked that his research suggests that Calhoun was very much prepared to explicitly establish a connection between animal and human behaviour directly and evidently.

The last paper focused on *Contemporary Debates in the UK about the Use of Animals in Science*. PRU HOBSON-WEST (University of Nottingham) reviewed quantitative and qualitative data from surveys assessing the public opinion regarding animal experimentation. She showed how different questions in interviews or questionnaires could change the outcome of polls that allegedly represented public opinion. Sections from (anonymous) interviews with scientists and animal rights campaigners provided an interesting insight in the different conceptions of the human-animal relationship and how this featured in contemporary discourses. The discussion began with the interesting question whether the former utilitarian concept of the âgreater goodâ as an argument for animal experimentation in science has now been replaced by *the public opinion*. Hobson-West answered this in a tentatively affirmative way, saying that even in acts of law concerning animal experimentation, the public opinion is implicit. The question remained of what came first, the acts of law governing animal experimental conduct, or an abstract âpublic opinionâ demanding legislative control. These reflections led to the consideration whether there really was or is an ethical am-

biguity towards animal research or scientific authority respectively. It was agreed that it might be worthwhile to take into account how polls and lobbies construct public opinion, since without technologies of elicitation and their results, the public opinion would be nothing but an empty signifier.

The final discussion picked up some of the major issues raised in the workshop. One fundamental question addressed the historical concept of the *laboratory animal*: from when on it would be prudent to speak of laboratory science proper? It was generally agreed that the notion of *laboratory animal* was tied to the phenomenon of the 19th-century rise of modern science, but that the conceptual changes regarding its status can be traced back to the late 17th century.

The need for interdisciplinary studies on the subject was another important point raised in the discussion. The historical issues raised in this workshop (e.g. matters of animal standardisation and the laboratory as a space generating a specific kind of knowledge) will contribute to discussions not only of interest to the history of medicine and history of science, but also to other disciplines, such as geography, sociology, or the life sciences. Vice versa, approaches from these disciplines can contribute to a better understanding of the changing conceptions of the human-animal boundary in the history of the biomedical sciences.

This well-organised workshop addressed a wide range of relevant topics in the history of animal experimentation and fostered lively discussions. The diverse backgrounds of the audience from various parts of the academic spectre added much to the value of the dayâs value.

Conference overview:

Massimo Petrozzi (Johns Hopkins University): Inside and Outside the Laboratory: Animals, Humans and Blood Transfusion, 1666-1668.

Stephanie Eichberg (Durham University): Constituting the human via the animal in 18th-century experimental neurophysiology: Albrecht von Hallerâs âSensibilityâ trials.

Frank Stahnisch (McGill University):. 19th-century French physiology and the conception of the human-animal analogy: The case of FranÃ§ois Magendie (1783-1855) and Claude Bernard (1813-1878).

Edmund Ramsden (Exeter University): Experimental methods in social and behavioural psychology: travelling facts in human and animal experiments in overcrowding.

Rob Kirk (University of Manchester): A Chance Observation: ethological approaches to laboratory animals and human health c.1945 - 1969.

Pru Hobson-West (University of Nottingham): Contemporary debates in the UK about the use of animals in science.

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