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EDITORIAL

Editorial: Concepts of Animal Welfare

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Four of the papers (by Donald Broom, Lennart Nordenfelt, Kirsten Schmidt and Christine Leeb) in this issue of *Acta Biotheoretica* stem from a symposium on the theme „Concepts of animal welfare—interdisciplinary perspectives" that was held on 8–9 October 2009 in Bad Neuenahr (Germany), organised by the *Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr Ahrweiler GmbH*. The papers by Richard Haynes as well as by Sjaak Swart and Jozef Keulartz were invited in addition.

The aim of the symposium and of this issue of *Acta Biotheoretica* has been to bring together experts representing animal welfare science, philosophy and social sciences in order to discuss how philosophical analysis and explication of scientific terminology, concepts and theory may support the further development of animal welfare science; this in light of the broad use of the animal welfare concept in animal ethics, society and legislation. This issue of *Acta Biotheoretica* is thus a contribution to the current theoretical debate on animal welfare science. The focus is on the relationship between the historical as well as practical political context and normative content of the animal welfare concept.

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1 Historical Perspectives

History shows a multi-faceted relation of animal welfare science with the established scientific disciplines as well as with animal ethics and policy. A symposium that was held in the Netherlands at the end of the 1970s on the issue of *human* welfare may serve as illustration. The Dutch ethologist from Groningen University Gerard Baerends was asked for a contribution from the field of animal behaviour. He started his contribution with the remark that welfare was all about subjective feelings, which he stated were however outside the realm of the study of animal behaviour in the tradition of ethology as developed by Tinbergen and colleagues (Baerends 1978). Still, he continued, ethology could contribute to the field of human welfare through its study of motivational systems as systems which strive to regain balance (within reasonable time) after challenges (homeostasis). Welfare could be framed in regaining such a balance, and 'un-welfare' therefore in the impossibility to do so.

As the symposium was devoted to human welfare and Baerends was not an animal welfare researcher, the opportunity to address possible synergies between human welfare research and ethology was missed at that point. This has later become important, and Richard Haynes' and Lennart Nordenfelt's contributions to this issue specifically take a need for coherence between human and animal theories of welfare as a premise. Among the pioneers on welfare of farm animals in the early seventies, an approach similar to the biological part of Baerends' emerged: welfare was framed in terms of regaining balance, and lack of welfare in its impossibility to do so, expressed through changes in behaviour and physiology (e.g. Working Party of the 'National Board for Agricultural Research (NRLO)' 1975). In fact, early animal welfare research was exclusively framed in terms of chronic stress-related research, which had already established chronic stress-related symptoms indicating that animals could not reach their homeostatic condition. In the UK Donald Broom's animal welfare definition was formulated in a similar way and expanded to the various coping processes of individual organisms.

Animal welfare research for long amounted largely to measuring stress-related behaviour and physiology. This led to an uncomfortable tension with society, animal ethics and politics as animal welfare research was instigated by sympathy, if not empathy, with the poor conditions that animals were in. While politicians asked the question "Do animals suffer?", scientists replied "They show abnormal behaviour and physiology". In hindsight this focus on objective aspects of welfare might be interpreted as a direct side effect of the struggle of ethology to become accepted as a scientific discipline. Other disciplines involved in animal welfare research also keenly stuck to their standards of scientificness and to disciplinary or industrial interests when they framed animal welfare exclusive in terms of health or production parameters.

Animal welfare science only slowly gained credibility within the scientific community. From within veterinary science and animal science, animal welfare scientists seemed to criticize existing conditions and thereby carry the burden of not being independent and/or of being involved (too) emotionally. From within cognitive and neuroscience, applied researchers—in contrast with laboratory

researchers—were criticised for having less control over experimental conditions, and from within ethology, domesticated species were seen as poor research models.

In parallel however, starting already in the early days, scientists did nevertheless take on one of the greatest challenges, that is, trying to get a grip on the question how to incorporate and measure emotions in the field of animal welfare research, such as Piet Wiepkema at Wageningen University (Wiepkema 1985) and Jan van Hooff at Utrecht University (van Hooff 1974) in the Netherlands as well as Marian Dawkins at Oxford University (Dawkins 1990) and in fact also Donald Broom at Cambridge University (Broom and Johnson 1993) in the UK. By the end of the 1990s it was relatively generally accepted that sentience and emotions play an important part in welfare. Recent developments in the field of neurobiology, such as understanding cross-species brain-behaviour relationships related to reward, anxiety and stress have made it possible to address the neurobiological mechanisms of emotional processes more fruitfully (see for instance Boissy et al. 2007; Burgdorff and Panksepp 2006; Burman et al. 2008; van der Harst and Spruijt 2007; Mendl and Paul 2004; Spruijt et al. 2001). This has added to the scientific credibility of studying animals' feelings, although the relationship between the subjective experience of mental phenomena and their behavioural and neurobiological correlates or mechanisms does remain a challenge.

Balancing diverging views on scientificness and on the importance of different aspects of welfare has repeatedly proven difficult. In one case around the turn of the millennium, two scientific committees in Europe and Australia, respectively, reviewing the scientific literature, reached opposite conclusions regarding the acceptability (in terms of animal welfare) of individual stall housing for sows (see Fraser 2008, p. 241 ff). The discrepancy between 'scientific answer' and 'ethical–political question' also for instance frustrated policy makers in the Dutch Ministry of Agriculture in the context of discussions on fishing with live fish-baits: while scientists agreed upon the fact that this may be very stressful to the live fish-bait with serious negative consequences upon release, they disagreed on the question whether they actually suffered. Politics decided to ban fishing with live fish-baits based on suffering of these animals. This led to a stir among scientists. One group of scientists sent a letter stating that this was not in line with current scientific evidence and one group of scientists sent a letter to argue exactly for the opposite. Had fishing with live fish-baits been banned based on the argument that animals were extremely stressed during the procedure, such letters would not have been sent. Instead, refinement procedures would have been advocated by fisherman's parties as was done a number of years later during a national meeting on fish welfare in 1999 (Raat and Van den Bos 1999).

2 The Contributions in This Issue

Concepts that are important in the current debate have their history, and good descriptions of this are useful in clarifying the conceptual discussions. However, also the "good" in history depends on the framing and perspective of the author, especially when the history is as young as in our subject. We invited two authors to

deliver their perspectives of the last decennia. Both perspectives are quite different. *Richard Haynes*, as an ethicist, analyses the developments in the USA and *Donald Broom*, as an insider animal welfare researcher, describes the socio-political debate in the UK. Interestingly, both show the same trend of institutionalisation of the concept of animal welfare, while they position it in two quite different framings. Richard Haynes emphasizes how the concept of animal welfare has been confiscated by the scientific community to immunize critical accusation of animal welfare groups. He describes how definitions are used in a political fight for power in the domain of laboratory animal use. The contribution by Donald Broom takes almost the opposite framing: the natural scientist, who seriously develops a new scientific research field that is regarded by the seated academics as rebellion in the ethological mainstream, and that is seen as prone or close to the animal protection movement. In the end Broom's analysis is also a description of the welfare concept in political reality.

In contrast, the article by *Lennart Nordenfelt* is a comparative philosophical examination of the animal welfare concept, opting to disentangle the ethical conceptualisation from the socio-political context, which might be regarded as compromising the ethical issue at stake. Drawing on his background in the philosophy of human health, Nordenfelt re-frames the animal welfare concept in the tradition of human welfare conceptualisation. He disagrees with biological definitions such as those of Broom on two grounds: (1) they may lead to an identity of health and welfare and (2) ethical concerns are not directed towards biological processes as such. Nordenfelt goes on to zoom in specifically to the group of ethical theories that position the hedonistic aspect of welfare at the centre. Nordenfelt's argument thus resonates well with current trends in animal welfare science to empirically investigate positive aspects of animal welfare, such as play and mutual support (e.g. Boissy et al. 2007; Ohl and Hellebrekers 2009).

Another current trend in animal welfare science is the integration of different welfare conceptualisations into sets of indicators or measures. *Kirsten Schmidt* shows that the diversity of welfare concepts can be useful for animal welfare science and for animal ethics when the dilemmas that arise from the comparison of policy, derived from different strands of animal welfare research (based on different conceptions of animal welfare), are recognised as normative. She discusses the danger when one opts for a too rigid epistemological distinction between science and ethics, especially in the case of animal welfare science and animal welfare ethics. In line with Tannenbaum (1991) she unveils the hidden normative assumptions in "hard core" animal welfare research and the need for "hard core" facts in various ethical theories and ethical decision-making. Her appeal for an integration of the epistemological domains of science and ethics is important because although researchers in animal welfare often claim to see this connection, the scientific regime still tends to block ethical reflection in daily activity and disciplinary journals.

Where Kirstin Schmidt ends up with appeal to consumers to set the norms, *Christine Leeb* shows in a nice analysis of the praxis of organic farming, that the solution for a straightforward definition of the concept of animal welfare will not be reached by leaving it to the consumers. In the praxis of organic farming, the aspect

of welfare is additionally defined against "good" styles of animal management and husbandry. It is this management that is expected by the consumer when he or she purchases meat from animals formally being in a state of animal welfare. Animal welfare is defined by an organic way of farming, the organic way of farming is a normative valuation of a socio-economical way of living: the good life.

Sjaak Swart and *Jozef Keulartz* contextualize in a pluralistic ethical way the possibilities and impossibilities to translate core concepts within animal welfare science and animal ethics, using the example of wild animals under human dominion. They explore among others the notion of "flourishing" of Martha Nussbaum to address societal critics regarding circus animals. Their contribution illustrates how a pluralistic discourse of animal welfare science with ethics can be realised, which is crucial if the relation of science with ethics is intended to contribute to the standing of animal welfare science in the academic regime.

3 Perspectives from Theories of System Innovation

Donald Broom's paper shows an insider's perspective on how a generation of pioneers in animal welfare research struggled to be accepted by the generation still in power and to make animal welfare science influential in policy making and legislation. One might frame this in the current recent theories of system innovation (Elzen et al. 2010; Geels 2002; Loorbach 2007) as a niche initiative that struggles to find a place in the socio-technical regimes of the academic world. Although most papers in this field analyse historical cases of system innovation, such as telecommunication and the transition from coal to gas as energy source, some recent papers report on the emergence of new research fields, such as on ecological genomics (Roelofsen et al. 2011; Kloet et al. 2011). Four system innovation concepts are specifically interesting with regard to the rise of animal welfare research: the multilevel concept, the niche, the regime and the landscape. In 2002 Geels proposed a contextualized perspective in three hierarchical levels on the constraints and conditions that enable or block new knowledge innovations initiatives: the "dynamic multi-level perspective (MLP) on technological transitions".

Geels distinguishes three interacting levels: sociotechnical *regimes*, technological *niches* and the sociotechnical *landscape*. The definition of the sociotechnical regime Geels derived from Nelson and Winter's technological *regime* (1982), which implied the shared cognitive routines in an engineering community and explained that developments took place along specific 'trajectories', e.g. in animal behaviour research from behaviourism to cognitive sciences. In line with the constructivist perspective (e.g. Bijker 1995; Geels 2002) Geels broadened the regime notion by stating that also other actors contribute to technological trajectories like policy makers, users and civil society actors. He describes regimes as large, stable communities that stabilize existing trajectories, in our case animal behaviour research as a regime. As such they function as 'selection- and retention' mechanisms that generally produce a steady stream of (incremental) innovations: novelties in line with the expectations and demands of the existing regime. In

animal behaviour research, neuroscience methods were introduced to understand the workings of the inside of the black box, that is the brain: the neurobiology of reward and stress related behaviour.

The technological *niche* level—like the regime level—also consists of organizational fields. However, here smaller communities of devoted actors work on the creation of 'radical innovations', such as pain perception in fish and boredom in pigs. Temporary protection from main stream market selection is necessary for niches to become stable and to survive and have impact on the regime. Niches according to Geels therefore function as 'incubation rooms'. Many countries have seen special governmental grants for research into animal welfare issues. Organic farming and other options for "animal friendly" husbandry are nowadays explored by farmers, retailers and animal welfare scientists.

The sociotechnical *landscape* level is described as an exogenous, slowly changing environment. It casts regimes and/or niches or puts pressure on them, but is beyond the direct influence of regime and niche actors, e.g. economic fluctuations, climate change and urbanisation.

Within the academic world the niche initiative is usually an interdisciplinary field, here animal welfare research. The sociotechnical regime is a community unit, for instance the academic world or the industry that is defined by different professional rules, legislation, education, norms and values. For instance, publication rules and standing journals will limit publication opportunities from new emerging research fields without their own journals. Even when they start with a journal, the absence of historically grown and well established citation index scores, will place them far behind. The contribution of Richard Haynes describes precisely the resistance of the standing academic regime to incorporate notions from the NGOs to redefine their academic way of animal handling. At the same time, although on a different continent, Donald Broom describes from within how he experienced these tensions as an academic as well as one of the major advocates to incorporate the niche of animal welfare science in the academic regime. In both contributions the unduly harshness of the regimes in power becomes clear. This resistance is, however, only partly due to the tradition of the academic regime. A more systemic part of the resistance (and resilience after for instance scandals and white papers) comes from the interrelatedness of several regimes together. This is illustrated in the paper of Christine Leeb who shows that the niche of organic farming not only has to fight for a place within the agricultural regime, but has to redefine and re-establish its relation with the academic world (animal welfare concepts from an organic perspective), consumers/NGOs (animal welfare as a distinctly "better" husbandry system), industry (labelling for retail, transport logistics and entrepreneurial codes) and government (veterinary quality control and regulations). Animal welfare seems, at least in some countries, to become an instrument as well as an end in itself to force a radical change towards a system change in the agricultural regime.

The stabilizing effect of the governmental regime is portrayed in the contribution by Richard Haynes when he criticises the slow process of animal welfare regulations regarding animal experimentation. And also Donald Broom emphasizes how animal welfare research data have to fit with the history of legislation of the

governmental regime. Some aspects of animal welfare (e.g. subjective experiences of animals) are not easily and straightforwardly formulated in the academic world and in the legislative governmental discourse. On the other hand the government is in potential a more flexible regime than the others. Political changes in priorities might take place every 3–6 years in most democratic countries. However, politics are bound to a small margin of policy freedom that is left over from the legacy of long-term policy decisions of preceding administrations, which were negotiated by existing regimes. The multi-level perspective describes that a niche domain like animal welfare science might take advantage of the moves at the landscape level. The development of communication through internet supports the NGOs and organic farming movement to become known by the public and therefore might influence the governmental policy in states with deliberative governance. Urbanisation might change considerably the expectations of citizens regarding "good husbandry". The urban citizen redefines in this changing context the weight of the values at stake. In the contribution of Sjaak Swart and Joseph Keulartz on the issue of wild animals this is nicely illustrated. The academic standing of institutionalized validated knowledge might be overruled by postmodern valuations by society: is it about poor welfare (pathology) or ideal welfare (flourishing)?

The contributions of Richard Haynes, Lennart Nordenfelt and Kirsten Schmidt analyse the role of values in the welfare debate. Changes in value priorities take place in the public discourse, enter the political arena and destabilize the mutually bounded regimes. It might be the sole action that opens up the room for manoeuvring which might pave the way of the niche of animal welfare research to become an integrated part of the re-established academic regime, in the future. The contribution of Lennart Nordenfelt might be seen as an exploration of the width of the gap between the animal welfare values and the established medical ethical model. Richard Haynes pinpoints how the gap between conceptualisation of welfare in humans versus animals may lead to disregard of animals. Kirsten Schmidt, from the other side, questions the validity of the academic assumption to exclude normative aspects from their regime. By doing this in the domain of animal welfare research, she creates the necessary space for manoeuvring and adaptation that might result in an adoption of animal welfare conceptualisation.

4 Heuristic Perspectives

Animal welfare science may thus gain strength from its close relation with philosophical ethics (a point previously made by for instance Sandøe and Simonsen 1992; Fraser 2008), ensuring the field's relevance for the animal issue and for society at large, its political independence and, as we have argued here, ultimately its academic quality and standing.

One of the contributions of the discourse between philosophy and animal welfare science is that animal welfare scientists are repeatedly challenged to pay attention to new normative aspects in their conceptualisation of welfare. Haynes and Nordenfelt here argue for an emphasis that would do justice to the way the concept has been constructed for humans. Other aspects often suggested for inclusion in the

conceptualisation of welfare are naturalness, integrity, or dignity, or death. Broom in line with the mainstream of animal welfare scientists argues that these are objects of moral consideration, but not part of welfare, but this position is controversial because it refers to a technical understanding of animal welfare that may be somewhat removed from its use in everyday language or in animal ethics.

Another challenge from philosophy is the interest in the mental phenomena that form the basis of moral consideration of many of the animal-based welfare aspects. When focussing on the animal's point of view, it remains a non-trivial question how those aspects that are considered morally important lend themselves to scientific investigation. Although progress has been made in investigating phenomena in animals which we know in humans to be the neurobiological and behavioural correlates of subjective states, a focus on hedonistic aspects of animal welfare still poses major problems with regard to the investigation and interpretation of subjective states in animals. And although scientific scepticism about mental properties in animals is not *en vogue* within animal welfare science or indeed animal ethics, it may be contextually appropriate as Colin Allen pointed out at the Bad Neuenahr meeting. This is most obvious in marginal cases such as regarding species that are deemed particularly intelligent or close to humans, or in which the ability to have subjective experiences is more controversial (effectively all but birds and mammals). It should be kept in mind that ethically problematic research is often conducted to gain understanding of the mechanisms of mental properties in animals. The appropriate degree and context of scientific scepticism about mental properties is thus one of the points of contact between animal ethics and philosophy of animal welfare science.

It has been a substantial step forward for the conceptualisation of animal welfare that biological and hedonistic perspectives, while often constructed as opposing approaches, have been shown to substantially overlap both in theory and in practical consequences. This holds irrespectively of whether aspects such as affect and biological functioning are seen as separate broad views, as for instance by David Fraser, or as elements of one view, as for instance by Donald Broom, and fits nicely with the idea of measuring many aspects of welfare. Fraser has long advocated an integrated view of welfare (Fraser 2008), and Broom has long advocated the use of a variety of measures in order to capture a specific situation, because the different measures can shed light on different aspects of the situation (e.g. short term vs. long term effects), and because some of the measures may not be sensitive to a particular problem.

The European research action *Welfare Quality*® (Botreau et al. 2007; www.welfarequality.net) and the European Parliament's STOA (Science and Technology Options Assessment) report (Bokma-Bakker and Munnichs 2009) illustrate that despite a conspicuous and ongoing lack of consensus on the essence of the concept of animal welfare and on its ethical frame, and despite the fact that emphasis on one or the other (set of) measures will still often lead to differing conclusions regarding animal welfare, the last decade has seen the emergence of a broad mainstream consensus regarding the strategy for operationalisation of the welfare concept within animal welfare science and policy (de Cock Buning 2009). Sets of criteria such as those advocated by *Welfare Quality*® essentially encompass

very basic ideas of what may be important to animals, and the weighting of normative aspects reflects the frames set by the major stakeholders in animal production. This is undoubtedly a strategy that can have great impact and is of major value for the implementation of animal welfare measures. It uses the broad inclusion of stakeholders' input to animal welfare criteria to target the situation that socio-economical factors have been a more important cause for the slow change of conditions for animals than lack of evidence for poor welfare or lack of persuasiveness of ethical arguments for the moral consideration of animals.

However, as Haynes argues, animal welfare science working *within* the socio-economical frame at its worst can legitimise the continued use of animals in conditions that will never change more than cosmetically. In integrative approaches to animal welfare science, the level of decisions on the relative importance of the different aspects is pulled away from politics and into science. In order to avoid that momentary views influenced by a group of stakeholders get undue influence it requires open dialogue with all concerned parties. Dialogue should especially focus on moral frame reflection, and it should be revisited regularly. Otherwise, integrative approaches to animal welfare with their high level of pluralism can tend to disfavour continued ethical discourse on the basis that the ethical discourse has in a sense already been taken into account. If further discourse is not promoted and integrative approaches are left to stand alone, they can therefore ultimately intensify what Haynes calls the "appropriation" of the welfare term by animal welfare science and the alienation between animal protection and animal welfare science. The European examples above illustrate practical pluralism regarding the different aspects or measures of animal welfare without explicitly pluralistic consideration of competing ethical views from a philosophical perspective.

Despite the advances made in seeing overlaps and integrating views in animal welfare science, analysis of the implications and exact meaning of the various approaches to animal welfare remains important not only from the point of view of ethics and policy. Each of the contributions by Nordenfelt, Broom and Haynes illustrates this in its own distinct way (see also Lerner 2008). Within the scientific realm, without critical examination of the concept we would not have seen many of the advances that have taken place over the past decades. Without attempts at capturing the concept's essence, animal welfare science might for instance have stopped short of entering the difficult arenas of feelings and subjectivity, individual coping strategies and personalities, or positive emotions. One of the most recent examples is that rather than discussing welfare in the context of homeostasis, welfare is now sometimes discussed in the context of allostasis, i.e. the concept of changing set-points, indicating that animals are not only more flexible in dealing with challenges, but also that challenges by themselves are not a problem per se (Korte et al. 2007). In line with this, the dynamic interaction between stress and reward is more often considered as a way to understand how activation of reward-systems may be beneficial in regulating the stress response and thus welfare (see e.g. Dudink et al. 2006; Van der Harst et al. 2005).

Donald Broom concludes his account in this issue with the positively connoted observation that the „diversity of animal welfare science is increasing and the expansion is likely to continue". Animal welfare science is probably faring well

with the dual strategy of an integrative practical approach to operationalisation, targeting the socio-political reality and practical constraints of welfare assessment, and a connected theoretical debate about the essence of the concept of animal welfare and its ethical content. Although the lack of consensus on the essence of the animal welfare concept does not bother animal welfare scientists too much on the whole, the relationship between animal welfare science, its epistemology, and animal ethics still requires a lot of work, which may prove valuable in securing the field's academic quality and standing, and avoiding its instrumentalisation. There is thus potential for mutual benefit from continued and more intense cooperation between animal welfare science and philosophy, and we hope to make a contribution to this process with this issue.

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