Understanding Animal Welfare
The Universities Federation for Animal Welfare

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• Promoting and supporting developments in the science and technology that underpin advances in animal welfare;
• Promoting education in animal care and welfare;
• Providing information, organising meetings, and publishing books, videos, articles, technical reports and the journal *Animal Welfare*;
• Providing expert advice to government departments and other bodies and helping to draft and amend laws and guidelines;
• Enlisting the energies of animal keepers, scientists, veterinarians, lawyers and others who care about animals.

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Sir Peter Medawar CBE FRS, 8th May 1957
Nobel Laureate (1960), Chairman of the UFAW Scientific Advisory Committee (1951–1962)

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**Universities Federation for Animal Welfare**
**The Old School, Brewhouse Hill, Wheathampstead, Herts AL4 8AN, UK**
**Tel: 01582 831818 Fax: 01582 831414 Website: www.ufaw.org.uk**
**Email: ufaw@ufaw.org.uk**
Understanding Animal Welfare

The Science in its Cultural Context

David Fraser
Animal Welfare Program
University of British Columbia
Vancouver
Canada
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The welfare of animals has, in recent years, become a matter of widespread and prominent concern around the world. Although through history in many societies there have been traditions for respect of and kindness to animals, what is new is that, to a remarkable extent, these matters have come to be on the centre stage. So now – as it has become very clear that, in our growing billions, we directly or indirectly influence the quality of the lives of very many other animals – the natures of all these interactions are, one-by-one and from North to South and East to West, being sifted through, re-examined and reconsidered. What are their impacts from the animals’ points of view? Can they be justified? How can adverse effects on welfare be prevented or ameliorated? As this process of radical review progresses, so animal welfare considerations are increasingly informing the ways we should conduct all our dealings with other animals and being formally factored-in to animal management systems.

Although it has gathered momentum only recently, animal welfare science – that directed at determining animals’ needs and how these can be met – has already proved to be powerful in changing attitudes and practices and seems likely to become increasingly influential. At this stage it is helpful and constructive – towards charting the best way forward – to reflect upon how and why the current interest in animal welfare has come about, on how welfare science can contribute to tackling problems (which often have major cultural or non-technical aspects), and also on its limitations.

Undertaking broad syntheses is difficult and in his preface to this book, David Fraser mentions some early misgivings in embarking on an introduction and overview of this broad multidisciplinary topic. However, where the various threads of complex subjects can be drawn together to provide a thorough but accessible perspective (that is, where there is someone with the rare combination of knowledge, skills and determination to do it) such synthesis is extremely worthwhile and valuable as this stylish and excellent book demonstrates.

We are most grateful to David Fraser for this book and proud to include it in the UFAW/Blackwell series.

James K. Kirkwood
April 2008
In a field of science that draws on a number of different disciplines, it may seem unwise for any one person to attempt an introduction and overview of the entire topic. Surely the discussion of stress physiology should be written by a stress physiologist, the health-related parts by a veterinary scientist and so on. I feel, however, that there is also a need for an integrative work that explores the connections between the different types of knowledge we use when trying to understand animal welfare. Especially in a field where different types of scientific information are sometimes used to draw different conclusions, we need to see an overview of the forest even at the expense of expert examination of certain important trees.

The book is divided into three parts. Part I (Chapters 1–4) is about the cultural context in which the field of animal welfare science arose. It tries to show how the ideas in the field were influenced by different modes of thought and by certain historical events at the time when the science began. These chapters also go much farther back in history to argue that animal welfare science should be viewed as one (distinctly contemporary) attempt to solve the ancient moral dilemma of how we ought to treat animals. A sub-theme in these chapters is the mutual influence that occurs between science and other elements of culture.

Part II (Chapters 5–10) is about the methods of animal welfare science. Each chapter deals with a different set of methods: studies of basic health, studies of physiological ‘stress’ responses, studies of abnormal behaviour and so on. These are more conventional review essays, although here too I have tried to bring out some of the context, history and development of the scientific approaches to studying animal welfare, rather than focusing on the most recent or technically advanced examples. I hope that these chapters will serve as accessible introductions to contemporary methods and debates in the field.

With the various methods and their limitations discussed in Part II, Part III (Chapters 11–13) explores the logic involved when we try to draw conclusions about animals welfare, often in complex situations where different types of evidence may point in different directions. These chapters examine some current debates
and applications of the science to policy issues, and use these as talking points to explore some of the ways that ‘facts’ and ‘values’ interact in the conduct and interpretation of animal welfare science and of science generally.

I hope that the book will be of value to several groups of readers. The principal audience consists of those who want an introduction to animal welfare science. I have in mind students, veterinarians, scientists, animal producers, and others in the animal care professions, together with corporate and government workers who are involved in animal welfare and its application. To keep the book accessible to these readers, I have tried to outline and illustrate the key methods and debates of the field without a welter of technical detail.

A second audience consists of scientists and graduate students already working in the field. For them, I hope that Parts I and III will set the field in a cultural and historical context that they will find thought-provoking, explore the origins of some beliefs and assumptions that have become embedded in the field, and examine how debates and disagreements among scientists sometimes boil down to different value-based beliefs and assumptions rather than disagreements on technical matters. Part II will be of less interest to these readers; undoubtedly they themselves could have written more thorough reviews of their specific areas of research. However, I hope these chapters may provide some historical context and integration of ideas that may be of interest even to specialists.

A third audience might be captured under the term ‘science studies’. Animal welfare science is a small, emerging and multi-disciplinary field. It is also an example of ‘mandated science’ – science that has been brought into existence to guide action and policy. I believe that a study of animal welfare science makes points about the place of science in society, the influence of culture and language on science, the interplay of ‘facts’ and ‘values’, and the complexity of interpretation in multi-disciplinary fields. Thus a study of animal welfare science may function as a case study of science and society, in much the same way that examining a small and complex star cluster can serve as an introduction to astronomy.

I HAVE MANY PEOPLE to thank for their support and assistance in writing this book. First and foremost I am grateful to my wife Nancy who made this project possible through her truly extraordinary support, not only during the two years when the writing was a daily preoccupation, but also during the 37 years when her ability to create a happy home environment, even amid mosquito-infested moose swamps, gave me the freedom to pursue the scientific interests that ultimately resulted in this book.

It is also a pleasure to thank my colleagues in the University of British Columbia Animal Welfare Program, especially my exceptionally supportive co-workers Dan Weary and Marina von Keyserlingk, plus many other valued colleagues in the Faculty of Land and Food Systems, the W. Maurice Young Centre for Applied Ethics, and further afield, most notably historian Rod Preece, and many colleagues who have served with me on animal welfare policy, advisory and funding bodies.
including the Animal Welfare Working Group of the World Organization for Animal Health, the Food and Agriculture Organization of the United Nations, the Burger King Corporation, the National Council of Chain Restaurants, the Food Marketing Institute and the Animal Welfare Foundation of Canada.

In an important sense, the book had a gestation period of some 35 years, and many friends and co-workers along the way have made important contributions to my understanding of the field. I would mention in particular Peter Phillips, Brian Thompson, Ed Pajor, Jeff Rushen and others in the former Centre for Food and Animal Research, Ottawa; Harry Lumsden, Ed Addison, Charles MacInnes and Hank Hristienko in the Wildlife Research Section of the Ontario Ministry of Natural Resources; Colin Whittemore, Andrew Fraser, Ian Duncan, Barry Hughes, Mike Gentle, John Savoury and the late David Wood-Gush and Frank Elsley during my years in Edinburgh; S.A. Barnett and Michael Hansell during my years at the University of Glasgow; and Jerry Hogan, Nicholas Mrosovsky, Sarah Shettleworth, and the late I.M. Spigel during my years at the University of Toronto.

I also want to acknowledge the many people who have contributed to the field of animal welfare science whose work I have not cited but who have nonetheless made important contributions to our understanding of the subject. Because my aim was to illustrate and discuss key concepts, rather than provide an exhaustive review, I have selected certain examples to make the points, and am painfully aware of the large amount of good work I have had to pass over. I also want to acknowledge some colleagues whose friendship and hospitality I have made a life of working in this field particularly enjoyable, especially Bo Algers, Mike Appleby, Don Broom, Marian Dawkins, Ian Duncan, Sandra Edwards, Andrew Fei, Andrew Fraser, Bob Friendship, Harold Gonyou, Temple Grandin, Paul Hemsworth, Per Jensen, Jin Suk Kim, Jan Ladewig, Andrew Luetscher, Vonne Lund, Guy-Pierre Martineau, Joy Mench, John Patience, Janice Swanson, Joe Regenstein, Bernard Rollin, Paul Thompson and John Webster.

The book profited greatly from the suggestions of several friends and colleagues. Drs. Ed Pajor, Evan Fraser and Dan Weary kindly read the manuscript and made many valuable comments. Many individuals provided helpful suggestions and comments on passages or chapters. These include John Barnett, Marc Bracke, Ron Broglio, Robert Dantzer, Marian Dawkins, Ian Duncan, Ingvar Ekesbo, Alan Hein, Paul Hemsworth, Georgia Mason, Jill Mellen, David Mellor, Dana Miles, Elisabeth Ormandy, Viktor Reinhardt, Janeen Salak-Johnson, Ernest Sanford, Chris Sherwin, Ragnar Tauson, Tina Widowski, Nadja Wielebnowski and Yasushi Kiyokawa. I am grateful to all these colleagues for their kindness and attention even when I have not taken their advice.

Several people have helped me find illustrations. These include Ingvar Ekesbo, the children of the late Ruth Harrison, Marlene Halvorsen, Carol Knicely, Hal Markowitz, Nadja Wielebnowski, Yasushi Kiyokawa, Chris Sherwin, Ian Dohoo, Hank Hristienko, Robert Zingg of the Zurich Zoo, and Jim Schulz of the Brookfield Zoo who took the stunning photograph that appears on the cover.
I have been very fortunate to have the research assistance of Jane Orihel, Nicole Fenwick and Anna Drake, all of whom patiently found sources, drew figures, checked details, and graciously tolerated the wild-goose chases I set them on when trying to locate dimly recalled publications. Finally, in a service far beyond any call of duty, my cousin Susan Simons read the entire manuscript and gave me the benefit of her expertise in written English.

In various places I have used or reworked material from my own earlier essays. It would be too tedious for the reader if I attempted to put quotation marks around all the phrases or sentences taken from these sources, so I have chosen instead merely to indicate in the notes where I have drawn on previously published material. In some cases these were from jointly authored essays, and I am grateful to Rod Preece, Dan Weary, Ed Pajor, Barry Milligan, Joy Mench, Suzanne Millman, Ian Duncan and Lindsay Matthews for kindly allowing me to pilfer bits from our joint publications.

Finally I need to express my gratitude to many animals, especially of two species – pigs and moose – whose animal welfare challenges created the scientific questions that have kept me engaged during much of my research career, and have taught me much of what I know about animal welfare. I refer to them repeatedly throughout the book, much as others might cite influential human mentors. If the book seems to rely too much on these species, I can only say that were it otherwise, it would not be my book.
For Nancy
Part I

Animal Welfare in Context
Introduction

In 1964, the Vancouver Aquarium commissioned Mr. Sam Burich, a local sculptor who also had experience as a commercial fisherman, to kill an orca. Orcas, or ‘killer whales’, are impressive predators that can reach nine metres in length and weigh over eight tonnes. Burich’s task was to use the carcass of an orca to make a lifelike replica which would hang from the ceiling in the new foyer of the Aquarium as an impressive display to greet visitors.¹

In May of that year Burich, with ample assistance from scientists, photographers and Aquarium staff who were keenly interested in the project, set up a harpoon gun on a coastal island near a stretch of water where orcas were known to pass. They waited for many weeks, but few orcas came into view and the team had no success in harpooning those that did. Gradually, the scientists and other personnel returned to their normal duties leaving Burich and one assistant to keep up the watch.

Finally, on 16 July the Aquarium received an urgent message. Burich had sunk a harpoon into the body of an orca which was now struggling vigorously on the line but showed no sign of expiring. A hasty decision was made to tow the orca some 60 kilometers to a makeshift enclosure in the port of Vancouver. There the orca, named Moby Doll by its captors who mistook it for a female, quickly became a celebrity. An estimated 20,000 people flocked to see it on the first day when public viewing was allowed. Stories about it appeared in Time, Newsweek, Life, The New York Times and a host of other publications. A film about the orca and its capture was shown in 43 countries.

The orca died only 75 days after it had been captured, but the experience was enough to demonstrate the huge public interest in a live orca and the unexpected docility of a species that had previously been considered too dangerous to keep in captivity. On this basis, the Aquarium decided to construct a tank large enough to accommodate a live orca display, and for the next three decades a series of wild-caught orcas became the star attractions of the Aquarium.

¹This story is related in Newman, M.A. 1993. The History of the Vancouver Aquarium, Vancouver Public Aquarium Association, Vancouver. I am grateful to Peter Hamilton for bringing this book to my attention.
By the 1990s, however, the Aquarium found itself facing increasing pressure from critics, the media, and some of their own paying customers who questioned the ethics of keeping captive orcas. Surely, the critics argued, such an intelligent and social animal must live a miserable and unhealthy life swimming in a concrete tank and putting on daily shows for the amusement of spectators. After a lengthy debate, the Aquarium decided that it would no longer keep wild-caught orcas in their facility. Releasing a long-captive orca to the ocean was out of the question because it would likely die of starvation. Instead, in 2001 the Aquarium transferred its last orca to a facility in San Diego where she would at least have more space and the company of other orcas.

The Vancouver orcas provided one small example of a profound change in human attitudes toward animals that occurred in the second half of the twentieth century, especially in the European and English-speaking countries. The change was paralleled in virtually every aspect of the human use of animals. A few examples follow.

In the 1950s, many jurisdictions in North America paid out public funds as ‘bounties’ to encourage citizens to kill wolves as a public service, either to protect livestock or to increase populations of deer and other wild ruminants that formed the basis of recreational hunting. However, research in the relatively new scientific fields of ecology and animal behaviour had already begun portraying wolves as intelligent animals that live in tight-knit families and serve the vital ecological function of keeping natural prey populations healthy. Wildlife biologist Aldo Leopold even used a gruesome encounter with a family of wolves to communicate his developing respect for wild nature:

We saw what we thought was a doe fording the torrent, her breast awash in white water. When she climbed the bank toward us and shook out her tail, we realized our error: it was a wolf. A half-dozen others, evidently grown pups, sprang from the willows and all joined in a welcoming melee of wagging tails and playful maulings .... In those days we had never heard of passing up a chance to kill a wolf. In a second we were pumping lead into the pack, but with more excitement than accuracy; how to aim a steep downhill shot is always confusing. When our rifles were empty, the old wolf was down, and a pup was dragging a leg into impassable side-rocks .... We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes – something known only to her and to the mountain.

Faced with such depictions of wolves by scientists, public perception of wolves underwent a remarkable change, to the point that bounties were eliminated in

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