

erosions are acknowledged by the authors as is the limited scientific understanding of the effects on fish well-being. Common methods of assessment are advocated to aid farmers in adjusting their husbandry practices to reduce the incidence of fin erosion.

A discussion of fish welfare during transport sets out the principles on how transport is likely to affect the welfare by road, air and on water. The legislation and guidance available in the UK is listed, as are the impacts on the Five Freedoms. The discussion provides little practical guidance and is only useful for familiarising oneself with general issues of fish welfare during transport. In contrast, the section on welfare during harvest is a mixture of the scientific principles, on-farm applications and some guidance on current industry best practise. The chapter logically addresses the harvesting operation from planning until the animals are dead. Feed withdrawal, crowding, removal from cages, transport to slaughter, stunning and killing receive adequate attention with an emphasis on on-farm procedure rather than the scientific principles. This chapter would provide a good overview for undergraduate students and a good guide for farmers. Unlike most of the chapters in this section, the information is not specific to salmonids and is thus likely to be useful to a larger audience in aquaculture.

A short chapter on diseases and medicine highlights the effects of disease on welfare, the lack of fish medicine choices in the UK and how treatment regimes can affect welfare. Sea lice, furunculosis and production diseases are used as examples of the constraints to treating fish. The chapter would have benefited from some discussion of health management and disease prevention especially in light of the previous chapter from a farmer's perspective that sets out that veterinarians should be more involved in health plans to prevent disease. The aetiology of soft tissue and spinal deformities is discussed with husbandry practices that may increase incidence of the conditions being highlighted. The chapter raises the interesting question of whether aquaculture should be actively selecting out fish with natural deformities, as they would normally be removed from populations through natural selection.

A final chapter in the second section of the book is a report on a series of focus group meetings conducted with stakeholders in the UK to discuss the interactions between water quality and welfare in farmed rainbow trout. This chapter provides a rare but very useful insight into how the different interest groups perceive farmed fish welfare and what the expectations from the different parties involved in safeguarding fish welfare are. Particularly useful were the results of the farmers and the veterinarians' focus groups as they resulted in pragmatic operational welfare indicators. The topic will be of interest to those responsible for formulating fish welfare policy; those that audit fish welfare and scientists researching farmed fish welfare.

The last section of the book is a chapter on ornamental fish welfare. This is a very welcome chapter as it adds to the information available on the subject and also feeds into farmed fish welfare on topics such as transport and diseases.

It covers issues at all stages from production, transportation and ownership. The chapter includes information on training and OATA recommendations for fish transport.

This book covers a lot of the extensive field that is fish welfare and has contributions from across the field, including leading scientists, veterinarians and farmers. It is a good introduction to general issues in fish welfare and has a bias towards farmed salmonids. Apart from the general information on stress, pain and fear, and general topics on water quality there is little information that is directly relevant to laboratory fish welfare. Information is presented that is a foundation for operational indicators of fish welfare. The book is an indispensable reference for students of aquaculture and animal welfare. Although the book focuses on studies in the UK, most of the information is relevant to all aquaculture activities in many countries.

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The Animal Ethics Reader, First Edition

Edited by SJ Armstrong and RG Botzler (2003). Published by Routledge, 2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN, UK. 588 pp Paperback (ISBN 0-415-27589). Price £22.99.

I was extremely pleased to have the opportunity to review this book. It is a structured collection of articles, extracts and papers from a variety of authors, from a variety of viewpoints and in a variety of styles bringing together a hugely readable collection of thoughts and analyses on animal ethics and welfare — a real emporium of interesting snippets for those with a passion for and involvement in human-animal interactions.

A rather large tome (not unusual for this subject), it begins with a foreword by Bernard Rollin. So enthusiastically written in Professor Rollin's straight-talking style, it creates the first spark in motivating the reader, especially the novice reader, to grasp this enormous volume and bury one's head in the rich offerings contained therein. There follows a general introduction which, although brief, contains a thorough overview of the history of human thinking towards animals from the earliest interactions with animals in the primitive hunter-gatherer societies to the current views and moral thoughts on how we treat animals. It provides a flavour of the wide-ranging animal use challenges in contemporary western society which are to be presented in the various thematic parts of the book.

The book comprises ten thematic parts each focusing on particular areas of animal use or human animal interaction. Each part begins with an introduction that succinctly and eloquently provides an overview of the theme and balances any contentions arising. We start with the theories of animal ethics and contributions from well-known writers such as Tom Regan, Peter Singer and David DeGrazia. Part two explores animal capacities: pain, emotion and consciousness. This is perhaps one of the most adversarial sections

containing the polarised analyses of Bermond's 'The myth of animal suffering' and Griffin's 'In favour of animal consciousness' with Marian Dawkins finding the middle ground with her cautious yet thorough 'Animals minds and animal emotions'. Part three discusses primates and cetaceans and their ever-increasing moral status in western societies including the thought-provoking 'Is a dolphin a person?' by Mary Midgley.

Part four focuses on food production and contains a veritable mix of papers from diverse authors such as Temple Grandin, David DeGrazia, Andrew Linzey and Michael Fox. These are interspersed with feminist-vegetarian critiques and a rather simplistic pro-intensive farming analysis of animals living under factory conditions. This chapter contains very succinct but informative summaries of the major religions' views on meat eating and farming methods. The following part moves into the polarised world of experimental animals yet manages to move beyond the traditional issues and includes thought-provoking papers on ecological field experiments (Farnsworth and Rosovsky), ornithology (Emlen) and education (Balcombe). The related subject of animals in biotechnology is discussed in the next part and again there is a good mix of sub-topics providing a timely analysis of the current issues in this field.

Wildlife issues are next in line and again some rather timely papers on trophy hunting and wildlife management (including relocation and rehabilitation) are presented. This leads smoothly into the eighth part on zoos, aquaria and entertainment. Although the authors provide an American slant to the issues (rodeos, dolphinarium, etc) the ethical analyses are still pertinent to UK zoo issues and additionally provide an insight into cultural differences in the way animals are used in these areas.

The penultimate part looks at a number of aspects of companion animal issues but actually encompasses additional issues such as assistance animals, animal abuse and broader if not more esoteric topics of our relationships with animals and how this influences our view of the world around us. The papers in this section are disappointingly short and there are some notable omissions, such as horses, reptiles and fish kept as companions. Finally, part ten is a somewhat disjointed section on animal law and animal activism. Legal rights for great apes is a current topic and given due consideration by Stephen Wise and the section is

completed by an appraisal/justification/explanation of animal rights activism including violence and terrorism.

Each part finishes with a reasonably complete further reading list and a number of study questions. These are simple, succinct but useful additions to the themes to allow readers to start thinking in more detail about the topics they have just read.

However, it is clear from the introduction and the works contained within this book that the focus is on Western cultures and the animal use issues arising therein. In the ever diminishing 'global village' in which we all operate, some analyses or at least comments on Eastern (and other) cultural views on animals would have been useful — if only as an introduction to the challenges ahead as pharmaceutical companies, for example, rely more and more on Chinese research and development centres that use animals or indeed the Vietnamese and Chinese primate breeding centres that supply European and US research facilities.

In conclusion, I totally agree with Bernard Rollin who writes in his foreword that this book is "a wonderful assembly of relevant readings in animal treatment and animal ethics". The diversity of the sub-topics that underpin the major themes of the book presents a hugely comprehensive selection of papers on how we humans interact with animals. The quality of some of the papers is disappointing but this is easily overwhelmed by the overall impressive nature of the majority of papers presented. As Bernard Rollin states in the foreword: "this anthology is far and away the best, most comprehensive, and readable introduction to a full range of issues associated with the new thinking and concern about animal treatment". I quite agree and would enthusiastically recommend this book to any student of animal welfare and ethics, anyone employed in any area where animals are used, including animal care staff, policy makers, animal charities and interest groups. Veterinary surgeons who, like myself, have more than a passing interest in animal welfare and ethics will find this an enjoyable, informative and thought-provoking read.

Readers of this review should know that the second edition of this book has recently been published and the themes, although remaining intact, contain a number of sub-topics that differ from this edition and will likely complement rather than replace this edition.

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