

Book Reviews

A Dictionary of Zoo Biology and Animal Management

PA Rees (2013). Published by Wiley Blackwell, 9600 Garsington Road, Oxford OX4 2DQ, UK. 332 pages Hardback (ISBN 978-0470671481). Price £90.00.

In his introduction to this book, the author states that this dictionary serves as a companion piece to *An Introduction to Zoo Biology and Management*. As such, readers should not be surprised that the dictionary does not always provide the most satisfying amount of detail for some of the key entries related to animal management in zoos and beyond. What this book does provide, however, is a true cornucopia of fascinating, sometimes quite random, but nonetheless useful scientific and applied animal management information that those unfamiliar with the zoo and aquarium industry will find beneficial as an introduction to this field. Covering legal terms, people and places, ecological and physiological processes and mechanisms, husbandry terminology, behavioural insights, and even a handful of famous animals and animal-based films, there is plenty that a reader can take away.

This publication would certainly be useful for students whose courses involve some aspect of animal management, and who are looking for an easy way to navigate some of the complex terminology and jargon they may encounter. These could be veterinary students and technicians, those interested in animal agriculture, or those pursuing more focused studies on animal ecology, conservation, and zoo biology. However, students with an interest in some of these fields *and* the application of science and animal management in research facilities and labs will be disappointed to find little or no lab animal information available. The decision not to include this information may have been based on the author's lack of familiarity with this field, but the consequence of this is the drawing of a rather arbitrary line between management approaches and laws affecting zoo, farm, and companion animals, and those relevant to lab animals. For subjects like animal welfare, the scientific approaches taken and implemented are just as relevant to these lab animals as they are to any of the others mentioned.

This publication serves as a good starting point for further research into a topic, but the explanations and descriptions of terms provided should not be seen as detailed or nuanced enough by themselves. In the absence of the companion publication, readers specifically interested in a certain topic might find it hard to piece together all of the parts of the zoo animal management puzzle relevant to that topic from the dictionary. Indeed, they might often find themselves distracted by the vast range of topics covered. In my own experience, what started as a search for 'negative reinforcement' sent me on a voyage through the book that made stops at 'Nim Chimpsky', 'nitrogen cycle', 'Jaws', and even 'dodos'. There is definitely a little for everyone within this book. The question remains whether there is also sufficient depth for each population who might use it.

The author is well aware of this issue, and even brings it to the attention of the reader in the preface: "...a colleague once advised me never to buy a tool that purports to serve more than one function, as it would perform none of them properly. In writing a book that attempts to explain words used in such a very wide range of disciplines I hope I have not made this mistake". My assessment of the utility of this publication would be much improved if the author had presented a more confident statement on why this book would be useful to different populations of readers, and how he envisioned its use. As a publication directly connected to the author's previous work, this dictionary serves as a broad and useful expanded glossary of key terms. However, for those seeking to understand some of the more complex terminology associated with a specific topic, such as animal welfare, and to understand how different animal management practices can both contribute to and resolve animal welfare issues, most will find that this does not really stand alone as a resource.

Many of the animal welfare terms relevant to zoo animal management are covered briefly within the book. This subject is a multidisciplinary one that integrates perspectives from behaviour, veterinary care, physiology, neurology, and even ethics, and so a wide-ranging book is somewhat of a necessity to grapple with these content areas. The definition of 'animal welfare' provided could have been a little more comprehensive, though. Given the increasing importance of this subject area within the zoo and aquarium industry, and the role it plays in our understanding of why animal management practices are changing (or are having to change) over time, it would have been good to see a greater emphasis given to this term so that it would serve as a hub for the other terms relevant to its understanding (eg, assessment, emotion, control, coping, motivation, stress, suffering). Unlike many other entries, there are no cross-referenced terms within this definition, and so it feels a little like a dead-end for readers exploring this topic. The Broom definitions of welfare are a useful starting point since there is a lack of an agreed-upon or formalised definition of this concept. However, it is a little frustrating to see a term such as 'etc' added to the list of considerations that can affect animal welfare. Readers using this book to find information on this topic should be presented with the full range of topics they need to explore further — if they knew what these unmentioned considerations were then they would likely not be looking for this definition in the first place. Returning to the issue of a lack of a focus on lab animals, defining animal welfare as a discipline "concerned particularly with the welfare of companion animals and animals living on farms and in zoos" is not just inaccurate and misleading, it is wrong.

If the primary audience for this book is students and early-career, frontline animal care staff (ie, zoo keepers and aquarists), then they should be given the opportunity to grapple with some of the changing perspectives relevant to the field of animal welfare. This publication does not really

add much depth to any of the welfare-related terms included, nor does it seek to challenge traditionally held perspectives on some of these terms. For example, animal keepers and students are often drawn to more traditional explanations of concepts like ‘stereotypic behaviour’ as a way to understand the animals they work with, as these provide deceptively straightforward explanations of what they are observing. Using this term as an example, as our understanding of the neurological and physiological basis of this behaviour has improved, it is harder to provide a simple definition of this term that is still useful. Mason and Rushen (2006) explore this term in great detail, and their preference for a broader range of behavioural types and syndromes (falling under the broader term ‘abnormal repetitive behaviour’) certainly adds a layer of complexity that would have been useful to integrate into the dictionary. Providing straightforward explanations of very complex terms is a useful goal, but so is preventing overly simplistic conclusions being drawn from observation of this sort of behaviour. Students and early-career professionals should be exposed to complex concepts and terms (eg, perseverance) to steer them away from seeing highly complex phenomena only from black and white perspectives, and to give them an opportunity to broaden their knowledge through additional exploration of topics.

This publication provides more accurate descriptions and explanations for behavioural-based concepts than for some of the physiological processes addressed. The physiological aspect of animal welfare is complex, and may not be a key component of the day-to-day management of animals in zoos by frontline staff members. Few students will have easy access to use techniques such as enzyme immunoassays or radioimmunoassays (two tools not mentioned in the book) to explore physiological processes. However, readers would still benefit from a clear and accurate understanding of relevant physiology to appreciate their role in the behavioural and physiological responses shown by the animals they interact with directly or indirectly. This dictionary does give readers a very basic understanding of some of the very complex physiological processes going on within animals. This is important since many will not have a high degree of comfort with these topics. Minor changes to several of the physiological terms covered would go a long way to improving the accuracy and utility of the information provided, though. Analysing levels of cortisol found in serum does not represent a ‘non-invasive’ method for measuring the stress response, as implied in the description of ‘cortisol’. The term ‘stress’ should not automatically be seen as a ‘state of anxiety’, as stated, but rather a physiological activation. These sorts of misunderstandings can quickly become fixed in the minds of students, and every opportunity should be taken to stop this from happening. There also needs to be a greater focus on the neuroanatomy of the brain (eg, neocortex, amygdala) for different classes of animals. Understanding the role of the brain in controlling learning, sensory perception, and subjective emotional states is critically important in terms of being able to comprehend the psychological well-being aspect of animal welfare.

Students and frontline staff should also be able to understand the role that different types of assessment need to play in effective animal management in settings like zoos and aquaria. With limited time, resources, and personnel, animal management practices (eg, enrichment) should be subject to ongoing assessment to determine their effectiveness or success. The broad range of welfare assessment approaches available (eg, cognitive bias; consumer demand; various Wisconsin General Test Apparatus approaches) are either not mentioned, or not covered in sufficient enough detail to highlight their growing importance in everyday animal care and management. For example, when describing how the expression of a simple preference by an animal does not necessarily equate to an animal ‘choosing good welfare’, the author is in danger of confusing the true nature of what animal welfare represents — a changing state based on a combination of welfare measures, but ultimately defined from differing ethical standpoints, and not something an animal can be *given* or can *choose* directly.

In general, the book would have benefited from some additional editorial oversight, such as fixing inconsistent punctuation use, making the word ‘data’ plural, and definitely eliminating the use of ‘etc’ in various definitions and explanations. It is perhaps a little unfair to criticise the tiny subset of hand-picked terms described above within this extensive publication, especially when focusing only on a very specific topic area like animal welfare. Few of the suggested user groups for this publication would approach this book from this narrow perspective. Some of these criticisms are outweighed by the significant amount of useful information that is provided on such a large number of topics in mostly clear and complete ways.

As a whole, the book is very accessible to the reader, and would appeal to its targeted audiences in terms of making complex concepts seem straightforward, and ensuring that they can understand the language used in scientific papers, husbandry manuals, studbooks, and other types of animal-related documents. I can safely say that on every page of this dictionary there were at least two terms that I had either never heard of before, or had only a vague understanding or knowledge of. In these cases, I benefited from the simple descriptions provided. As such, this means that this publication achieves its goals of providing basic information or perspectives that its readers might lack. Students and those without a zoo or academic background in zoo biology (eg, science writers, governmental or charity/non-profit representatives, professionals in the policy field) will find this book to be very useful in helping them communicate much more effectively with professionals in the field. It is successful in providing the reader with a common language, and enough context to use that language, to communicate ideas and understand many relevant issues and controversies. Those readers looking for more detailed and in-depth information on topics such as animal welfare will not find this publication as useful.

Joseph Barber,

East Allens Lane, Philadelphia, USA