audience whose attitudes and knowledge we wish to alter. Likewise, I found the implication that simply raising awareness alone would necessarily change human attitudes and thus improve animal protection somewhat naïve. In terms of aiding the prospective educator, I consider an opportunity to address the education and learning process itself was missed. For example, what should education aim to act upon? Knowledge alone may not necessarily be implemented if it is counter to beliefs or not perceived to be of personal relevance; positive and caring attitudes may actually be detrimental to welfare without appropriate knowledge — pet obesity is an example of 'killing with kindness'; animal welfare-promoting behaviour may not be implemented if a person does not perceive it to be their responsibility, they perceive it to risk censure or they do not consider their behaviour will make a difference. So, is it necessary to alter knowledge, attitude, behaviour or combinations of these factors? How do we achieve this and how do we address barriers to their implementation? The value of using participatory techniques to facilitate change in many contexts is well known; working with the target population to facilitate self-generation of knowledge and attitudes, together with ownership of and investment in strategies to ensure appropriate implementation and maintenance of behaviour. Finally, how do we know that the education is successful? The author highlights testing competency in training of professionals who handle animals but this is not possible with more general education of consumers and citizens. Traditionally, feedback forms on educational events address enjoyment and interest but does this actually reflect our desired change in practice? Addressing areas such as these would be a significant step forward in generating information on best practice and achieving successful outcomes via education.

Although my expectations were not met, the author does clearly state the intention to take a broad approach and it is likely that the mismatch is due to the definition of education as 'awareness' and possibly pitch at a different audience. The scope of the book would be much clearer if it were entitled *Raising Awareness for Animal Protection*. The book's implications for animal welfare are in raising awareness of certain issues highlighted within the text which might encourage some readers to take action and bring about reform to improve protection of animals. However, as indicated, there are areas, such as the issue of diet where perceived animal welfare benefits may not actually be forthcoming. Overall, the book outlines a benchmark of the current status of animal protection and is an interesting and relatively quick read, but it does not contribute anything particularly new to the employment of education and I would not recommend it as an academic text.

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Field and Laboratory Methods in Primatology: A Practical Guide, Second Edition

Edited by JM Setchell and DJ Curtis (2011). Published by Cambridge University Press, The Edinburgh Building, Cambridge CB2 8RU, UK. 456 pp Paperback (ISBN 978 0-521 14213 7). Price £35.00, US$70.00.

The second edition of *Field and Laboratory Methods in Primatology*, edited by Joanna M Setchell and Debora J Curtis offers a comprehensive guide that incorporates many areas of field research. It is intended for the use of primate field scientists, perhaps in particular those in the early stages of their career, and it provides much valuable data regarding why and how to perform field studies. I consider the book's greatest strength to lie in its ability to convey the writers' own (hard-earned) experience to the readers, providing them with a clear image of what to expect at the study site (although the unexpected invariably also occurs), and consequently to prepare appropriately. The book comprises twenty-one chapters; some provide descriptions regarding specific research domains such as ethnoprimatology and thermoregulation, while most review various aspects of field research that incorporate a wide range of research interests, such as employing the global positioning system (GPS) in ecological research, marking and radio-tracking, and handling captured individuals.

Studying wild populations of non-human primates is essential to our understanding of their natural traits and behaviours. With the continuing adverse effects on wildlife caused by human interference, such as deforestation and poaching, 'knowing more' may be equal to 'saving more', as 63% of primate species are currently either under threat or their fate is unknown. With the alarming rate of habitat destruction, and the risk of extinction to primate species, acquiring data for use by future generations is vital. Such data on the wild primates' behavioural and socio-ecological features can then be utilised by animal welfare scientists in order to design and maintain suitable environments for their captive conspecifics, and to evaluate their well-being. Indeed, many researchers consider the expression of a normal behavioural repertoire in captive animals as a sign of 'good welfare'.

Field research of non-human primates has undergone major shifts since its early stages, from the collection and dissection of specimens and comparative anatomy to anecdotal reports of behavioural biology in the wild, quantitative studies conducted in the wild and, finally, to studies integrating laboratory and field techniques. In parallel, the readers can find in the book detailed accounts of basic behavioural observation methods, instructions for the use of computerised sophisticated equipment such as the Geographical Information System (GIS), and remote sensing that integrates data on location of the animals and environmental data.

Field studies are conducted in the belief that their outcome will be beneficial for humans (eg by acquiring knowledge on pharmacological substances that can be used to repel parasites), and/or for the animals (eg in cases of conserva-

https://doi.org/10.1017/S0962728600004036 Published online by Cambridge University Press

tion-orientated research). Nevertheless, concerns regarding possible negative impacts that study-related, unnatural interference might have on the lives of the studied animals exist in any field research. In the following, I discuss some of the potential risks to the well-being of studied wild primates that are associated with field research, together with suggestions for coping or avoiding them. It seems fair to assume that the closer the interaction between humans and primates, the greater the risk of potential negative impacts, such as the introduction of new pathogens and the imposition of stressful states when capturing or handling the animals. In chapter 2, the process of habituation involved in such proximity is discussed. The authors clarify that although habituating animals to human presence has several advantages, such as in obtaining records of fine-level behaviours, there are also some significant dangers, including increasing the animals' vulnerability to poaching, and modifying their natural behaviour (eg by provisioning). Unfortunately, other than a general directive only to habituate primates when it is possible to protect them for the rest of their lives, no specific instructions or suggestions are provided on how to avoid the potentially negative side-effects of habituation. The trapping of primates for the purpose of identification, radio-collaring and taking physical and physiological measurements is common in many field studies. While trapping is suggested to be safer, and perhaps less stressful for the animals than darting, this procedure requires a thorough training. For example, in Chapter 7, the authors state that there should be no restriction to capturing pregnant females or infants as long as they are handled appropriately. Dependent infants should thus be kept in a cage along with their caregivers (ie mothers or other group members). Primate groups should also be captured at the same time in their entirety in order to avoid possible changes in the social status of the group members. Mating, for instance, may be affected if consortships are disrupted long enough, and in gelada (*Theropithecus gelada*) and hamadryas (*Papio hamadryas*) baboons, for example, harems can break up, or be taken over by rival males. Using gang traps rather than individual traps can probably minimise the chance of social disruption, but these are more difficult to operate, and potentially more stressful for the animals, especially for the smaller individuals that are more likely to be the target of aggression from their conspecifics. Multi-chamber traps designed to capture entire social groups may provide a solution to this problem. In general, the total time that the primates are held in the traps should be kept to a minimum, in order to avoid stress, negative social effects and injury. Animals should be handled with care, and released back to the trapping site after the gathering of as much data as possible. If conditions allow, data should be gathered from individuals at the trapping site itself, followed by their release, rather than transporting them to field labs.

One of the main reasons for capturing and restraining wild primates is in order to mark them for identification. There are several methods available for marking wild individuals, each with its advantages and disadvantages: fur shaving may expose the skin to sunburn, insect bites and abrasion; freeze branding may cause blistering or permanent skin damage if not done properly, and there is the risk of disrupting natural hair colour and the patterns that play a part in the species' signalling system; and collars or belts should be fitted to the primates with care as they can compromise the ability of the individual to escape predators, as well as interfere with socio-ecological activities. Other marking methods include tattooing, ear notches or punches, and ear tags; but their use is ethically questionable.

The final example of welfare risks associated with field research comes from chapter 11, which in my opinion is the most intriguing chapter in the book. The authors present a tutorial for field experiments with non-human primates, integrating experimental designs into field research, thus enabling the testing of hypotheses regarding the primates' behaviour and cognitive abilities. These experiments usually involve the presentation of stimuli and measuring the animals' response. However, while the gain from conducting field experiments seems potentially vast, it should be noted that special care should be taken in order to prevent a situation in which the subjects become habituated to certain stimuli that may prove to be hazardous in 'real-life' situations (eg predator model or vocalisations).

Although close encounters with wild primates would seem inevitable in field studies, recent advances in technology have contributed to obtaining data while concomitantly reducing human-animal friction. For example, one can employ remote sensing methods in order to measure primary productivity and forest structure with high resolution. In addition, developments in conducting non-invasive hormonal measurements enable scientists to collect data on the anthropogenic impacts on primate physiology and behaviour, thus adding a major contribution to our estimation of the viability of threatened species. The same methods are also widely used in laboratory settings in which data are collected without increasing the animals' stress levels, which aside from the obvious welfare concerns related to invasive procedures, may additionally introduce bias into the results (eg in corticoid analyses). Genetic data can also be collected non-invasively for various uses, including conservation purposes. In an era in which habitat fragmentation is escalating due to human interference, there is immense significance to the correct management and maintenance of genetic diversity.

Finally, a reoccurring issue throughout the book concerns the importance of appropriate preparation before setting off to the study site. This of course consists of acquiring the relevant permits, consulting with experts, purchasing the relevant equipment etc. There is an additional element of preparation that also appears in several chapters of the book: the notion of visiting zoos in order to study the species to be researched in the wild and to test the equipment (eg types of collars used for transmitter mounting) prior to setting out to conduct the field study. This concept not only emphasises the important role that zoos have in providing behavioural data, but also the significance of maintaining an appropriate (as for as possible)

https://doi.org/10.1017/S0962728600004036 Published online by Cambridge University Press

physical and social environment for the captive animals in an attempt to encourage natural behaviour and prevent the development of behavioural abnormalities.

I therefore highly recommend this book for anyone planning to embark on primate field research, and urge them to take the animals' welfare implications into serious consideration when carrying out their studies.

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Animals and Public Health: Why Treating Animals Better is Critical to Human Welfare

A Akhtar (2012). Edited by Palgrave Macmillan, Houndmills, Basingstoke, Hants RG21 6XS, UK. 234 pp Hardback (ISBN 978-0-230-24973-8). Price £55.00.

Animals and Public Health is a wide-ranging and ambitious book covering aspects of the human treatment of animals that impact upon animal welfare. Dr Aysha Akhtar, a public health neurologist, sets the scene by noting that many eminent thinkers, including Pythagoras, Immanuel Kant and Albert Einstein, have suggested that mistreating animals will come back to haunt us. Akhtar's major concern is that public health does not take seriously the link between our treatment of animals and human well-being. Akhtar concedes that public health is concerned with zoonoses, but she laments "rarely do we [public health] explore deeper than this and ponder whether the nature of our relationships with animals could play a role in whether they become infected with a pathogen in the first place". Akhtar appreciates that such pondering might be interpreted as being outside of the purview of public health and even radical. But, "public health is no stranger to social concerns (or even radical ideas). On the contrary, public health, throughout its history, has been an integral part of social change". Akhtar then documents how public health has challenged cultural and social mores, for instance the link between poverty and disease, women's and children's rights and stigmas against the mentally ill.

Chapters 3 to 6 of *Animals and Public Health* address how mistreating animals in the various ways we use animals leads to public health problems. These four chapters are concerned with the wildlife trade, industrial agriculture and the development of zoonoses, industrial agriculture and the environment, and animal use in biomedical experimentation. Consider the question that Akhtar is addressing: Why (is) treating animals better *critical* to human welfare? The objective of *Animals and Public Health* is to substantiate empirically the philosophical ideas of Pythagoras, Kant and Einstein. It is here that one can see that the central thesis is an ambitious one; Akhtar must demonstrate that treating animals better is critical to human welfare in all domains of animal use that she examines. This is why Akhtar had to address the charge of radicalism in her opening chapter, for do we not (ab)use animals precisely because it is beneficial to human welfare? Ultimately, then, Akhtar's broad thesis rests on three separate claims: namely, that treating animals better in the wildlife trade, in agriculture, and in biomedical experimentation are each *individually* critical for human welfare.

Before reviewing chapters 3–6 and their respective claims, a comment needs to be made about the second chapter 'Victims of abuse: making the connection'. It is aptly prefaced by the words of Immanuel Kant: "He who is cruel to animals becomes hard also in his dealings with men. We can judge the heart of a man from his treatment of animals". In this chapter Akhtar describes the well-documented link between animal cruelty and the abuse of humans. However, the reader might suppose it constitutes a natural linkage with the chapters on animal use that follow. The position and title of this chapter — 'Making the connection'—might lead one to think it grounds the argument in the following chapters. But there is the glaring issue of intentionality that Akhtar does not mention. Chapter 2 describes the *deliberate* abuse of individual animals and its relation to abuse in humans. In contrast to this, animal use in the wildlife trade, in agriculture or for biomedical experimentation are all commonly considered to be different to animal abuse. The former practices are motivated and justified (rightly or wrongly) by consequential human benefit. In the case of animal abuse there is no such motivation and the practice is regarded as morally unjustified and often is prohibited by law. This is problematic because the chapter does not do as much work as I suspect the author might intend it to do. Whether Akhtar intends this chapter to genuinely make a connection with types of animal use that are so different in terms of their motivation (utility versus cruelty) I am not sure. What can be said is that the well-known connection between animal abuse and human abuse does not provide any obvious support for the thesis of a general connection between treating animals better and human welfare.

A great virtue of *Animals and Public Health* is the sheer scope of the work and the myriad of interesting facts that Akhtar provides, fully referenced in an exhaustive bibliography. This veritable feast of facts begins in earnest in chapter 3 on the global trade in wild animals. Akhtar begins the chapter by describing Tyke the performing elephant going on a rampage in Hawaii and Rocky the grizzly bear turned Hollywood star taking a bite out of his handler and killing him. An example of a startling fact reported by the author is the estimation that between 5,000–7,000 tigers are kept in homes in the USA. Akhtar calculates that if this figure is accurate, there are more tigers living in American homes than in the wild! Despite being a human public health specialist, the animal welfare sections are well researched. For instance, Akhtar reports "Caged birds routinely display abnormal behaviours, such as self-mutilation and stereotypies". Furthermore, the author's criticism is not restricted to a welfarist ethics and she writes with a style that is often to the point: "Birds are most often housed in small cages, depriving them of the very thing that defines them: flight".

Documenting unfortunate but rare incidents and writing truisms on caging birds and denying them their flight are interesting and in ways important but are a long way off making a strong case for Akhtar's ambitious thesis. To make the case that treating animals better is critical for human welfare, the author needs to ground her argument in a maltreatment of animals that has the potential to cause

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