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Book Review

Kruuk H. 2019: The Call of Carnivores, Travels of a Field Biologist. *Pelagic Publishing, Exeter, UK: 211pp. ISBN: 978-1-78427-193-0.*

This book had been on my wish-list for some time, so when I was asked to review it, I was glad to be spurred into advancing it up my reading list. Although I have not previously read any of the many books that Prof. Hans Kruuk has written (including (Kruuk 1972, 1989, 2004, 2006)), I have read and cited his research papers detailing the feeding ecology of African predators and scavengers (Kruuk 1967, Kruuk & Turner 1967). As a carnivore biologist myself, Prof. Kruuk's observations of free-ranging carnivore diet and feeding behaviour provided a benchmark for my evaluations of dietary provision for the captive cheetahs, lions and vultures I worked with.

In "The Call of Carnivores" Kruuk sheds a more intimate light on his research career than we are able to glean from his numerous scientific publications. Readers are taken along for the scientist's geographical and professional journey as he entertains us with stories about the many aspects of fieldwork which never make it into published papers. Despite the typically dry and impersonal language used to describe fieldwork methodology in the peer-reviewed literature, Kruuk demonstrates the highly personal, far from dry (literally and metaphorically) experiences that comprise fieldwork. The many nights spent tracking animals by moonlight (or no light in many cases), periods spent hiding in damp and awkward crevices, or strained muscles arising from long hours spent bent over a microscope dissecting scat (faeces), and even the leeches of Australia, or midges of Scotland and Lake Victoria are charmingly described in the 21 chapters of this book.

The book starts with recollections of Kruuk's youth; chapter 1 describes how his intense curiosity about nature nearly killed the cat, when he undertook his first experiment to determine whether cats could swim by dropping his neighbour's pet into a stream (I assume the cat lived to tell another tale!). But later this curiosity was channelled into more appropriate activities with a natural history club and less invasive observations of the natural world. Chapter 2 reveals how Kruuk was able to move out from the "dark and dank" basement laboratory to the field, only to find that perhaps the field was not so glamorous after all; days spent gutting fish and dissecting their stomach contents in the name of science whilst suffering nearly continuous seasickness aboard a commercial fishing vessel would perhaps have been enough to put many people off fieldwork for life. But Kruuk's fascination with animal behaviour and the self-perpetuating list of questions about their behavioural ecology led him to seek further field-based opportunities. Under the mentorship of the Nobel Prize winning ethologist, Niko Tinbergen, perhaps best known for his "Four questions" (Tinbergen 1963), Kruuk recalls the profound impact that Tinbergen's persistent questioning of "why?" animals did what they did, had on his own epistemology. This innate curiosity, and adamant belief that nothing should be taken at face value until proven, shaped much (if not all) of Kruuk's subsequent research ventures, many of which led to ground-breaking discoveries about the social structure of carnivore species.

Objective observation is integral to good science and Kruuk explains in this book how his stubborn refusal to accept assumptions, untested 'knowledge' or unproven hypotheses led to many an eye-opening, game-changing discovery about animal behaviour. In chapter 3 we learn about the first observation that Kruuk made of a hedgehog (yes those adorable little visitors to our gardens) eating a gull chick alive; not such a harmless critter after all. Nature is violent and Kruuk has to fight his human instinct to intervene or help in order to just observe, and let nature be. Kruuk bears witness to a number of natural horrors but when a

Eurasian griffon vulture dies in front of him due to poisoning with agricultural chemicals, he doesn't just observe, he acts by campaigning against the use of such harmful chemicals in the environment, though unfortunately this ecological crisis continues today and threatens vultures across the world.

Kruuk's work with hyaenas in the Serengeti earned him the name *bwana fisi* (Swahili for Mister Hyaena). Indeed, Kruuk's hyaena research is what he is perhaps best known for, and he has made more than a few important advances in our understanding of hyaena ecology. In Tanzania, Kruuk's night-time observations of spotted hyaenas revealed that, contrary to popular belief at the time, spotted hyaenas are efficient and powerful predators which sometimes have their kills stolen by lions. Prior to this, accepted knowledge of the role of hyaenas in the ecosystem was that they were exclusively scavengers responsible for stealing prey from the more respected predators (the lions) of the savannah. By the time the game wardens and safari guides woke up and embarked on their dawn game drives, it was common to find a pride of lions feasting on a carcass, with a pack of hyaenas waiting on the periphery – allegedly waiting to pick up the scraps. But Kruuk was able to document that in fact the reverse was true; the hyaenas had made the kill, the lions had sauntered onto the scene and chased the hyaenas off so that they could get their fill before sunrise, and the hyaenas were simply waiting to get back to their own kill.

Nonetheless, Kruuk was always aware of the human tendency to let hypotheses run away with themselves – the insights into the working mind of a scientist reveal his constant questioning of his own observations, his strictly hypothesis-testing and mechanism-investigating approach was how he ensured that his growing confidence did not get the better of him. These moments of humble reflection are endearingly recounted in the book, including the moment that his reputation as a skilled safari guide in the Serengeti is taken down a notch by a black cobra that he inadvertently invites into the vehicle, and when badger-spotting in the UK his warnings to his visiting guests of the need to remain absolutely silent cause embarrassment when he himself sneezes just as the badger's nose appears at the entrance to the sett (only to very quickly disappear again!).

As most vertebrate biologists will empathise with, studying animals often involves dealing with a lot of crap……. (in the literal sense, i.e. scat, spraint, faeces, dung, excrement, amongst other synonyms!), and Kruuk's research was no exception. Kruuk compares the large, sandy almost pleasant-smelling voidings of aardwolf with the dry, white and crumbly scat of spotted hyaenas, and even recalls the human hair and beads often found in the latter as a result of the importance of hyaenas in burial rituals. These deliberations over carnivore scat assist in revealing important knowledge about their diet, their social communication and their use of the environment. At one point, his experience with glass beads in hyaena faeces even helps Kruuk establish previously undocumented home range and habitat utilisation strategies of badgers in British woodland (you will need to read the book to find out how). Kruuk also uses science to unravel long-held myths and beliefs but does so with compassion and empathy for the origin of these myths. For example, I was intrigued to learn of the rancid butter smell of hyaena scent marking secretions and its perception as the buttery trail left by witches who make this butter from the milk of the hyaenas they ride through the bush!

Kruuk provides an exciting and interesting narrative; a mixture of informative discoveries in the natural sciences and the recounting of his own personal experiences, reflections and contemplations. For those readers with a background in biology, especially those with field-based research experience, many of the stories will be familiar, perhaps evoking fond memories of your own, triggering a smile or laughter in recognition of shared experiences which may have at the time brought tears to your eyes but now provide comedy in hindsight. There are also stories that will likely invoke a sense of relief ("it was not just me!"), and probably one which will recall how close you came to real danger, or how things could have turned out so differently if it hadn't been for X, Y or Z. For those readers who have not experienced such pleasures, the book may inspire you to seek them out, but at the very least it will provide snippets of new knowledge, new and interesting facts about nature, and most of all, insight into the study of nature and the people living with wildlife.

The book is not the author's journal, memoirs or autobiography – the chapters are structured according to the species he is studying, rather than a chronological account of his life. As such,

the text skips around in time, and in place, but this does not detract from its story-telling style. Kruuk's description of the places he has worked in, along with photos and line drawings, bring these experiences and scenes to life for the reader. By the end of the book, it is easy to understand why Kruuk equates the Serengeti and Shetland Islands as equivalent; appreciated for their vast, open and diverse landscapes, and for their true wildness. He shares his learnings from each environment and demonstrates how knowledge and experience can be applied to other contexts.

I was, however, somewhat surprised to read of the role that "tamed" wild animals played in the discoveries and knowledge gained during Kruuk's career as a researcher. Kruuk reared several wild animals so that they were habituated to his presence, including a tame hedgehog, a hand-reared badger, and perhaps most beguiling of all, a spotted hyaena who would travel with him in the car, join him in the bath, and accompany him and his wife on camping trips. These animals were involved in Kruuk's observational field experiments and enabled him to learn about their behavioural responses to other animals or environments in a way that would not have been possible with a wild animal. However, invariably the benefits of their relationship were not sustainable in the long term – despite the deep affection and bond that Kruuk felt for these animals, the hyaena in particular (who features throughout the book), the animals did not live out their lives with Kruuk. Solomon (the hyaena) became a nuisance to local residents living near Kruuk's home in the Serengeti and repeated attempts to release him to the wild failed since the wild hyaenas would not accept Solomon and he was unable to survive alone (another revelation of hyaena sociality for Kruuk and the world). As a result (and with much guilt and sadness for Kruuk), Solomon lived out his days in a British zoo, where keepers developed close bonds with him and he was well known to the visitors. But other relationships ended less amicably – Kruuk suffered one of the worst animal attacks of his life from the badger he reared. Although this animal was also rehomed to a zoo, a highly unfortunate interaction between the badger and a young visitor to the zoo when the badger had escaped his enclosure meant that the badger had to be euthanised.

Underpinning many of the stories and discoveries that Kruuk discusses in the book is a sense of anxiety regarding the state of the natural world, and the human-induced threats it faces. Early in the book we learn that the site of his PhD research, and where much of Niko Tinbergen's ground-breaking discoveries were made, no longer exists – pollution has destroyed much of the habitat and wildlife no longer abounds there; "conservation has come too late" for this area. In chapter 7, observing a female rhino protecting her calf from a pack of 25 hyaenas, Kruuk reflects on the rhino's reliance on its horn (hurtling hyaenas across the field!). This leads to him pondering the validity of some conservation initiatives to de-horn rhinos for the sake of their conservation, removing the appendage so sought after by poachers. He questions the impact of disarming rhinos in this way. Likewise, Kruuk emphasises the human-human conflict at play in so many conservation issues. With empathy and an understanding deepened by personal experience, he discusses examples of where conservation and societal priorities are not readily aligned. For example, retaliatory killings of wildlife by Maasai occur following Maasai eviction from their traditional hunting and grazing lands in the name of conservation and eco-tourism. Kruuk listens to herdsmen in Northern Kenya explain the unseen costs of living alongside predators, such as the extra time it takes to collect wood to build larger *bomas* (enclosures), the increased clearance of trees as a result of constantly having to move *bomas* once they become tick-infested. He deliberates over the dilemma of whether free-living dogs should be eradicated due to the threat they pose for human health (rabies) or the benefit they bring in deterring livestock depredation by wild carnivores. His visit to a town in Ethiopia where hyaenas wander the streets, walking among people who don't give them a second glance, reveals the importance of human acceptance of wildlife. In this town, hyaenas are tolerated as they serve as waste disposal agents, cleaning up the streets after busy markets, and are even fed scraps of food each night to encourage their continued presence in the urban environment. These hyaenas do not seem to bother with the livestock in this town and have become entirely dependent on scavenging in their foraging habits. Kruuk laments such a fall in status for the hyaenas – even though they are often despised by locals in the Serengeti, they are at least recognised as predators to be feared, and yet here they are "dregs of hyaena society", begging for handouts from humans. However, without providing such a cleaning service to the local residents, the hyaenas would likely be persecuted as they are elsewhere – the value of wildlife is not intrinsic but is instead

dependent on what benefit or problem they offer humans. Herein lies the crux of most conservation issues (and interventions) today.

Kruuk concludes the book with his hope that his research will be relevant to people involved in conservation, and not just to those with a passion for natural history. He describes natural history as being able to "brighten any human life" and it was through his own passion for natural history that he was able to visit and immerse himself in many wild and exotic environments around the world. Kruuk's journey has led to him crossing paths with, or walking alongside, celebrities such as Niko Tinbergen, Charles Lindbergh, Louis Leakey, Gus Mills, and David Houston (to name but a few). Many others also helped to shape Kruuk's career, such as Stephen Makacha who tells Kruuk about some of the "unspoken" myths surrounding hyaenas and witchcraft, and 'Pimbi' (Hendrick Hoeck) without who Kruuk would not have been able to realise his dream of studying animal behaviour in the Galápagos Islands. Kruuk pays tribute to these people in his book, acknowledging those who have mentored him and those he has himself mentored, and those with whom he had opportunities to learn alongside. This book demonstrates how significant contributions to science typically involve a combination of conscientiousness, a good measure of fortuitous meetings or conversations, an abundance of peer support and most importantly – the capacity to recognise and seize opportunities with both hands when they appear.

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