Of gulls, geese and two men


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Every other year, up to a thousand animal behaviour researchers discuss their results at 'International Ethological Conferences', a tradition that was begun during the early 1950s by co-workers of the Austrian zoologist Konrad Lorenz and his Dutch colleague, Niko Tinbergen. The breadth of themes covered demonstrates impressively the integrative nature of what is still a young scientific discipline. As well as many other annual and biannual meetings, several scientific journals are also devoted to the study of animal behaviour and enjoy an ever-increasing popularity. Ethology – a story of progressive successes?

This question pops up repeatedly in Richard Burkhardt’s extensive treatise of the history of ethology. With the 1973 Nobel Prize laureates Konrad Lorenz and Niko Tinbergen as its founders and key actors, the first hundred years of ethology as a coherent biological science unfold before the reader’s eyes. Ethology was baptized by the American zoologist Morton Wheeler in 1902, long before the actors responsible for developing the field took to the stage. He proposed the term ‘ethology’ for the study of animal instincts, intelligence, habits and habitus. However, it was not until the 1930s that Lorenz’ work on the species-specific action patterns of birds, and his demonstration that behaviour can be used as ‘morphological structures’ to reconstruct phylogenies, gave the field its conceptual foundations. The comparative aspect marked one of the original hubs of this new biological study of behaviour. Another new aspect was the focus on naturally occurring behaviour patterns in more or less natural situations.

Burkhardt devoted 25 years to unravelling the social, political, scientific and also the personal situations and dispositions of individual scientists responsible for the development of the field. He describes, for example, how the Second World War and its political foundation influenced the development of ethology, particularly because of Lorenz’ obscure associations with Nazi ideology early in the Third Reich. The explanation of postwar reconstruction of ethology as a discipline covers two of the 11 chapters of the book, illustrating the importance of ‘ethology’s ecologies’ as Burkhardt calls it.

Lorenz and Tinbergen were very different people, with different backgrounds and scientific approaches. Tinbergen viewed ethology as the science ‘applying physiological methods to the objects of animal psychology’, focusing on the issue of behavioural causation. He was the naturalist with a strong analytical and experimental approach who tried to coordinate and structure ethology as a coherent scientific discipline, matching ranks with other branches of contemporary biology such as physiology, morphology and systematics [1]. Lorenz, in Tinbergen’s words, was by nature more of a visionary – an intuitive interpreter rather than an experimental verifier. His most important contribution was to design ethology as a biological science in the first place, and to call the attention of zoologists to the scientific explanation of behavioural phenomena. Both preferred to use birds as their model organisms, with ducks and geese being Lorenz’s passion and Tinbergen focusing mainly on gulls, which explains why ornithologists were their earliest audience. Both wished to understand underlying mechanisms of behaviour patterns and life processes. And both were exceptionally able to attract disciples to the field.

But whereas Tinbergen increasingly came to feel that work on survival value was what suited him best, Lorenz had never taken this issue into the field. In his textbook on ethology published in 1978, Lorenz grumbled that ‘ethology was like a coral, its branches losing contact with their foundation’ [2]. Tinbergen, instead, had continued to develop the field and remained its core actor for much longer. He added to Julian Huxley’s rather sloppily formulated ‘three major problems of biology’: causation, survival value and evolution, a fourth one: ontogeny. His conviction was that ethology needed to give equal attention to each of these questions and to their integration; his biggest worry was that the field might split up ‘into seemingly unrelated sub-sciences.’ His most long-lasting effect on behavioural research was his focus on the survival value of behaviour patterns, which spawned ‘behavioural ecology’ as a discipline. This research field has taken off over the past three decades of the 20th century and is often assumed to exist somewhat independently of ethology, despite being only one branch of the tree developed by ethologists over the preceding decades.

Not knowing one’s roots is a common mistake in the early development of scientific disciplines, a problem that Burkhardt’s thoughtful, comprehensive and readable book should help to resolve. It should be read by all animal behaviour researchers to help put their own efforts into perspective. As Marian Dawkins put it, ethology is a ‘science with its eyes on both, the long term and the short term, on evolution and mechanism’ [3]. This must not be forgotten if the scientific study of behaviour is to remain
the successful enterprise that it has proven to be during its first hundred years. The last picture of the many authentic black and white photographs of this book nicely represents the programmatic nature of the book for ethology as a field. It shows footprints disappearing somewhere in an indefinite background – Tinbergen’s photograph of fox tracks in the dunes. Whither ethology [4]?

References