Ethology Evolving

Studies in Animal and Human Behaviour. Vol. 1. KONRAD LORENZ. Translated from the German edition (Munich) by Robert Martin, Harvard University Press, Cambridge, Mass., 1970. xx + 404 pp. $10.

Konrad Lorenz, who so delighted the world with *King Solomon's Ring* and *Man Meets Dog*, and then frightened it with *On Aggression*, now makes available to the English-reading public the major papers of his more scientific work. The much-assailed co-founder of the science of ethology has been represented previously in English only by a shortened version of his "Kumpan" paper printed in *Auk* in 1937 and a recent monograph called the *Evolution and Modification of Behavior* (University of Chicago Press, 1965), which appears to have been badly translated. Here, however, Robert Martin does a superb job of rendering Lorenz's difficult conceptual German into sensible and accurate English. This first volume, and presumably the two to follow, will allow a much better appreciation and assessment of Lorenz's controversial ideas about animal and human behavior.

Lorenz's fresh introduction, and especially its abrupt attacks on many of the major popular authors, in particular Ashley Montagu, Desmond Morris, Robert Ardrey, and Mortimer Adler, who have put forth views of man's behavior that differ from his own, will certainly provoke all readers. (Those of us who voice disagreement to a narrower audience or in a narrower framework are treated more gently.) But serious critics of Lorenz's conceptualizations of behavior can no longer plead ignorance of his early work, for the development of his ideas is well represented here in nearly 400 pages of solid text. This first of three projected volumes covers the span from 1931 to 1942 and contains six major papers which well illustrate not only the evolution of Lorenz's thinking but also his method of approach.

A paper on the ethology of social Corvidae (1931) is the principal observational contribution in the collection, covering in fine detail the fascinating jackdaws introduced to most of us in *King Solomon's Ring*. The chapter has a twofold importance: it elucidates Lorenz's method of extensive and perceptive observation followed by induction, and it reveals the beginnings of important concepts in his thinking. But in laying bare the method this study also exposes its faults. For instance, Lorenz asserts, after discussing the first liberation of his young jackdaws, that "if the number of liberated birds had been only slightly larger, the flock would certainly have flown off," or, after describing the stress behavior of the birds, ". . . I did not dare to deliberately elicit this rattling-reflex so soon again. The birds would otherwise have become shy in a very short space of time." Again and again the reader is moved to ask, How does he know that? One thing, though, seems certain. By 1931 Lorenz knew intimately the behavior of a host of different animals—more than most of us will know that well in a lifetime.

The second paper, on methods of identification of species-specific instinctive behavior patterns in birds (1932), is the first of three rambling theoretical papers on behavioral concepts, illustrated freely with examples from Lorenz's own observations. Here we see the further development of notions such as releasing stimuli, imprinting, vacuum activities, and particularly Lorenz's notion of the intercalation of "instinctive" and "learned" components in chains of complex behavior. There is rough going in all these papers, especially the three theoretical ones, despite the competent translation and a bevy of new footnotes by Lorenz himself. For instance, this chapter opens with a sentence clearly equating "instinctive behavior patterns" with "the innate behavior pattern," yet when describing the egg-carrying behavior of jackdaws Lorenz states that "two factors indicate that this instinctive behavior pattern is probably innate." (Neither the context nor the original German clarifies this confusion for me.) In general, Lorenz's conception is that behavior either is "instinctive" or else has instinctive parts that are interconnected into a functional whole by conditioning (or, rarely, by insight). It is interesting that one of the strong justifications Lorenz offers for studying birds is that these animals do incorporate so much experience in the development of their behavior. Moreover, this appears to be one of the first assertions in the ethological literature that animals have behavioral patterns that are transmitted through tradition. The emphasis here on the ontogenetic development of behavior may surprise some of Lorenz's critics.

Roughly a third of the volume is devoted to Lorenz's classic paper "Companions as factors in the bird's environment" (1935). The translated title seems to me to fall very short of capturing Jakob von Uexküll's concept of the *Umwelt*—the subjective, perceptual world of a particular animal—from which Lorenz's essay begins. The word "world," which was used in the title of the abbreviated translation that appeared in the 1937 *Auk*, expresses the notion of the *Umwelt* better than "environment" does. But generally the translation here is much better than previous ones, and should help immensely in the study of Lorenz's thinking. Surely this paper stands alongside Darwin's *Expression of the Emotions* and Huxley's study of the great crested grebe as one of the true classics of ethology.

It is impossible to summarize so broad and deep a paper, representing as it does a major intellectual peak in the thinking of an extraordinarily perceptive man. Some highlights are the emergence of the concept of the innate releasing mechanism, a specific perceptual filter that lets through to the brain only certain key stimuli (releasers); and the first lengthy formulation of the concept of imprinting, whereby young nidifugous birds learn their species identity through a psychological attachment stamped in while they are following the parent. Here, too, I believe one discerns clearly Lorenz's new emphasis on internal "drive" and "emotional" factors, which have since become the key principle in his conception of instinctive behavior in man, as expounded in *On Aggression*. The influence of William McDougall's conceptions of human instincts is plain.

The last of the theoretical papers, "The establishment of the instinct concept" (1937), is largely redundant. Emphasis shifts to the maladaptiveness of behavior patterns in unique situations and to the usefulness of behavior in taxonomy as criteria for identifying instinctive behavior patterns, and Lorenz's ontogenetic conception of maturation (in contrast to experiential effects) blooms.

The penultimate paper, "Taxis and instinctive behavior pattern in egg-rolling by the greylag goose" (1938), is the only one in the collection that would be likely to be called "scientific" by modern criteria—which is to say that nearly a third of it has to do with some actual experiments on behavior. The experiments, simple but clever, test hypotheses concerning the way in which external stimuli control (or fail to control) the egg-retrieving response of the greylag. Indeed, this paper is the only evidence I could find that after making an inference from observations Lorenz has proceeded to test the inference directly. In fact, the careful experimental approach of this paper seems distinctly "un-Lorenzian." The frequent use of "we" (in contrast to "I" in the other papers) sent me scurrying to the second volume of *Zeitschrift für Tierpsychologie*, where the paper first appeared. After discovering that Niko Tinbergen was joint author of this paper I searched in vain for some indication of this fact in the volume.

Lorenz says in the introduction that he hesitated to include the final paper, "Inductive and teleological psychology" (1942), since it had been written largely as a specific reply to criticisms of the vitalist Bierens de Haan. It is true that half the paper is only of passing historical interest. However, like no other paper of Lorenz's that I have read, this one documents his views on epistemological problems in the broadest sense. It is here that he argues against the antireductionistic behaviorism of some American psychologists, as well as the entelechy of a now-dead generation. But what is most striking is Lorenz's conception of scientific method. Lorenz is arguing against rampant armchair constructions of logical elegance that bear no relation to reality, and this historical context must be kept in mind. It would seem to me, though, that Lorenz goes only one step further in his own "inductive scientific method" or "inductive scientific research." Although he boldly classifies himself in the tradition of Galileo, Lorenz fails to convince one that he understands the cycle from observation through induction and prediction back to subsequent observation that lies, however vaguely and discursively, at the base of all science.

One cannot easily sum up a great man's collected works, or even the first of three volumes of them. One marvels at and envies Lorenz's empathic perception of the animals he knows and loves; one's mind spins at the breadth and depth of the analysis he attempts; one admires his steadfast achievements during an era of hostile and facile views of behavior; and one watches with anticipation the emergence of the concepts that formed the basis for modern ethology. But one also laments the vagueness of many of those concepts and the apparent lack of interest in operationally formulating and rigorously testing initial hypotheses, which tend instead to take on the aura of fact through the mere passage of time. Nothing summarizes Lorenz's epistemology so well as his own phrase "inductively-determined facts."

With these reservations voiced, however, it is incumbent upon the reader to remember the enormous impetus Lorenz's work has given the study of behavior compared with the contributions of equally brilliant but more operationally and experimentally inclined students such as Jacques Loeb. Perhaps the lesson is that the early phases of a science require the power of a broad, sweeping intellect that has a certain disregard for the formalisms and pedantic, creeping construction of the ultimate scientific edifice. Perhaps what is essential is a fountain of sensible, if vague, ideas and orienting attitudes—correct in their broadest sweep if not in their precise predictions. Lorenz provided to ethology those sparks of intuition, and this volume sets out the historical record in a way vital to the understanding of Lorenz's current controversial views on the behavior of man himself.

JACK P. HAILMAN
Department of Zoology,
University of Wisconsin, Madison

Man and Anthropologists

The Emergence of Man. JOHN E. PFEIFFER. Harper and Row, New York, 1969. xxvi + 486 pp., illus. $10.

A number of popular books have appeared within the last few years which offer an interpretation of human nature based on recent discoveries in animal behavior, paleoanthropology, ethnography, stress biology, neurology, and other sciences not traditionally interrelated. These books, although differing in emphasis and style, are based upon a common theme (best stated in Pfeiffer's book):

The basic assumption is that much contemporary human behavior is based on patterns which became established during the last few million years of hominid evolution. Many current human problems result from radical changes in the human environment. Although these changes are largely results of human activity, our species has not had time to evolve adequate biological adaptations to the altered circumstances. It is argued that if we are to find rational rather than catastrophic solutions to these problems we will need to understand the consequences of the transformation, in but a few dozen millennia, of scattered groups of hunting and gathering peoples into crowded, industrialized city dwellers.

Human beings are biologically predacious and carnivorous, the argument continues, and our basic motivations and abilities are part of that habit. These characteristics became established as early hominids evolved in adaptation to conditions on the African savannahs between the Later Miocene and the Early Pleistocene. During this time our ancestors became more and more dependent upon a diet of animal protein, while by the combined use of bipedal agility and crafted weapons they avoided becoming animal protein for the ubiquitous Terrestrial Predator, the chief demon in the evolutionary pantheon.

By the Middle Pleistocene humans have developed means of hunting big game. Thereafter factors associated with communal killing of large mammals become the most significant selective agents in human evolution. Linguistic ability develops and by it men plan and coordinate their hunting forays. Food-sharing is necessitated by accentuated division of labor by sex. Rituals to enhance the hunt develop and religion enriches the lives of savages hunkering about their fires.

Following the end of the Pleistocene and the invention of agriculture, populations increase rapidly and factors that result from crowding replace big-game hunting as the most significant conditions to which humans must adapt. These factors, which include increased susceptibility to epidemic disease as well as accelerated interaction between and within human groups, are intensified by industrialization.