Ethology Encyclopedia Article

Ethology

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Ethology

The study of animal behavior under natural conditions is the science of ethology. It emphasizes the objective investigation of entire patterns of behavior in regards to function and evolutionary adaptation in an ecological context. Ethology encompasses all aspects of animal behavior, such as communication, foraging, courtship, sensory perception, learning, and orientation.

Although humans have been observing animal behavior for millennia, ethology has emerged has a relatively new science in the latter part of the twentieth century. The principle founders of ethology were the three co-winners of the 1973 Nobel Prize in Physiology and Medicine: Karl von Frisch; Konrad Lorenz; and Niko Tinbergen. Each scientist made great contributions to the study of the behaviors of particular animals and to the methodology of studying their behavior. Karl von Frisch conducted extensive studies of the sensory world of the honey bee, while Lorenz and Tinbergen made landmark contributions to the study of vertebrate behavior. Lorenz demonstrated the importance of descriptive work in behavior studies and identified several inborn or innate components of behavior. His most celebrated studies concern imprinting; a phenomenon of young animals fixating on particular objects or individuals during a brief critical time. Tinbergen developed novel experiments to investigate animal behavior and is especially noted for his study of key stimuli involved in communication.

Ethology is an integrated discipline encompassing neurobiology, ecology, and evolution. For example, ethologists would examine sensory and nervous systems of an organism for their role in communication among the population and ask of its adaptation and evolutionary significance. Several other disciplines, such as physiology, psychology, cellular biology, genetics, and population biology, also interact with ethology. Ethological studies may focus on the individual organism and determine the specific processes of sensory and motor nervous systems. Examining the sensory receptors on a moth antennae or the neurological mechanisms of how a cricket sings typify this approach. At another level, this discipline focuses on the behavior among a population of a species such as sexual, territorial, or foraging behavior and how these enable the population to survive and adapt to their changing environment. This population approach to ethology has now been defined by Harvard biologist, E. O. Wilson, as sociobiology, dealing with all aspects of sexual and social behavior, and behavioral ecology. Mechanisms of communication among nestmates in an ant colony or ranking the social status of individual primates would constitute a sociobiological study.