

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (First year)

Subject: Zoology

Paper Code: ZOG 102

Paper Title: Animal behaviour

Unit: 1 Introduction to animal behaviour

Module Name: Origin and history of Ethology

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Notes

INTRODUCTION TO ETHOLOGY

Ethology is the scientific study of animal behavior, usually under natural conditions and viewing behavior as an evolutionarily adaptive trait. It is also called behavioral biology. Behavior involves the static postures and active movements, the sounds and smell; and the changes of colour and shape that characterize animal life. Be it, a cuckoo laying its eggs in a crow's nest, a pup wagging its tail at the approach of an adult dog, the warning hissing of a viper, birds building their nests, rabbit digging its burrow or some beetles playing dead. The study of animal behavior is all about these things and many others.

The term ethology is derived from the Greek words, *ethos* meaning 'character' and *logia* meaning 'the study of'. There are two main approaches to understanding behavior: The physiological and the 'whole animal'. Behavioral physiology is the study of how the body works, that is how the nerves, muscles and sense organs are coordinated to produce complex behavior such as singing in a cricket or a bird. The 'whole animal' approach investigates the behavior of the intact animal and the factors that cause it, for instance what it is in the environment of the cricket or a bird that prompts them to sing at a particular time.

Behavior includes all those processes by which an animal senses the external world and the internal state of its body and responds accordingly. Many such processes will occur inside the nervous system and may not be observable. What is observable may involve activity of varied strength or no activity at all, but equally rank as behavior.

Some behaviours are innate (by birth) or genetically hardwired, well some behaviours are learned or developed through experience (acquired). Researchers who have studied avian songs or vocalization have found; E.g. Cuckoos when reared in isolation, major part of their song is innate, but nuances of song are learned from other individuals.

HISTORY OF ETHOLOGY

According to the records the term ethology was first used by Isidore Geoffroy Saint Hilaire in 1859. But he used the term ethology (French *éthologie*) for the study of relations between an organism and its environment. The area of study referred to as '*éthologie*', is now recognized as Ecology. However, an American myrmecologist William Morton Wheeler popularized this term in its modern context, in 1902. Ethology has its scientific roots in the work of Charles Darwin. Darwin was the first ethologist whose book "The Expression of the Emotions in Man and animals" (1872) influenced many ethologists.

Charles Otis Whitman (1842 – 1910), an American Zoologist is influential to the founding of classical ethology. His paper "Animal Behaviour" (1898) contains many well-chosen examples of innate behavior. His major work concentrated on courtship and breeding behavior of Passenger Pigeons (1910).

Oskar Heinroth (1871 – 1945), a German biologist and ornithologist who regarded as one of the founders of ethology was the first to apply methods of comparative morphology to animal behavior. He made extensive studies of behavior in ducks and geese. He hypothesized that many of their instinctive behavioral patterns and morphological features correlated with their

life histories. He suggested that the conspicuous wing patterns of ducks might serve to guide flocks in flight. He noted behaviour of ducks and those of hybrids and suggested that their behavioural cues could be used to deduce taxonomic relationships. He also noted that chickens were alarmed by long-tailed and short necked birds suggesting that these were the key characteristics of birds of prey. The idea that this response was instinctive was examined in greater detail by Konrad Lorenz and Niko Tinbergen (1951).

Wallace Craig (1876 – 1954), an American experimental psychologist and behavior scientist, provided a conceptual framework for the study of behavior organization and is also regarded as one of the founders of ethology. He experimentally studied the behavioural expression of emotions; the way innate and learned behavioral tendencies are integrated and how, individual as well as social behaviours are organized. He encouraged a view of behavior as an integrated process with evolutionary, motivational, experiential, social and ecological degrees of freedom. This integrative perspective helped shape modern behavioural science.

The modern discipline of ethology is generally considered to have begun during the 1930s with the work of Dutch biologist Nikolaas Tinbergen and of Austrian biologists Konrad Lorenz and Karl von Frisch. In 1973 Nobel prize for physiology was awarded to these pioneering ethologists who demonstrated that behavioural traits can be measured and they have evolutionary histories. Their work recognized that animal behavior although simpler than that of human beings, nonetheless contains many aspects that are similar and that such research contributes to the understanding of human nature.