

## PHYSIOLOGICAL AND BIOCHEMICAL BASIS OF LEARNING

Learning is the modification of behaviour by experience. An animal learns something when it behaves differently because of earlier experiences. Its new behaviour is more likely to improve its reproductive success and survival. Through learning, animals progress from a total dependence on releasers, drives and rhythms to a lesser dependence on them. "Habituation" is a form of 'response warning' a decrease in the probability of response to a stimulus upon repeated presentation of the stimulus. Habituation, one of the wide spread form of learning, is especially important in the development of behaviour in young animals. One of its chief values is its tendency to free an animal's brain of the need to respond to insignificant stimuli, while permitting it to concentrate on useful survival behaviour.

Many animals are capable of associate two or more stimuli with reward or punishment. This type of learning termed "Associative learning" was first studied by the Russian Physiologist Ivan.P.Pavlov. In an experiment on the reflex that causes a dog to salivate when it smells food, Pavlov first presented dogs with food and measured the amount of saliva produced. Then he added a sound – the ringing of a bell – every time food was offered. After the two stimuli, food and sound, had been presented together six times, he found that when dogs were presented only with sound stimulus they produced saliva. Pavlov termed this as "Conditioned reflex" which he defined as one in which the response to one stimulus becomes associated with another stimulus.

Learning is controlled by both neural and humoral factors. The nervous system of vertebrates always contain enormous numbers of neurons. Neural mechanisms constitute a proximate cause of behaviour. Understanding how nerve cells operate singly and in groups provide the basis for understanding how animals perceive and react to their environment. Different species have different neural mechanisms and therefore perceive different things and behave differently as well. Parts of brain like cortex, hypothalamus, limbic system and reticular formation variously influence the behavioural patterns. The role of brain on the innate and learned behaviour in Galah chick were extensively studied. Galah chick produces 'Begging call' (innate) and 'Contact call' (learned). Both the calls were produced by the vocal apparatus of the bird. These were under the control of their brain. The Galah's brain is so structured that a nestling tends to give a begging call when it is hungry and in the presence of the adult. The brain of Galah has components that store information about the contact calls. The ability to incorporate information about contact calls it hears from other Galahs reflects the capacity of its brain cells to store information about particular sounds.

The ability to behave instinctly or to learn something depends on nerve cells and development of those cells depends on both genes and environment. Instinct is more genetically determined than learning, where as learning is more environmentally determined than instincts.