DEGREE- PART I

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Innate behaviour

Behaviour in general is the sum total of the ways in which an organism reacts to its environment. Behaviour has a variety of meanings and may be approached in a variety of way. It has its conservative elements in the form of innate or instinctive behaviour.

Innate or instinct behaviour behaviour is the inherent or genetically determined response of an organism towards some external stimulus. Innate behaviour is is stereotyped or Fixed action pattern (FAP) and is almost exactly identical in every member of a population. Innate behaviour is not acquired through prior experience or learning. It is co-ordinated motor action and is transferred from generation after generation. The most common examples of such behaviour are feeding pattern, mating, nest building, parental care, vocalization, territoriality, aggression etc. ~~It includes following responses towards stimuli~~

(A) Characteristics of Innate behaviour

(i) Constancy or stereotyped — Innate behaviour is similar in all individuals (Conspecifics) of a species. It differs from simple reflexes in their degree of complexity. The entire body participate in instinctive behaviour and an elaborate series of action may be involved. Instinctive behaviour is the most important type of behaviour in insect. Fishes, reptiles and birds also depend to a large degree on inborn or innate behaviour.

Example - The spider's building of web is an example of instinctive behaviour. A long series of action is required to spin the web, but these actions and the final shape of the the web are entirely dependent upon instinct.

Nest building in birds is an example of instinct behaviour. Even when it has never been allowed to see

another member of its species of any nest, the weaver bird builds a nest characteristics of the species. From these examples it is clear that instincts are inherited just the structure of tissues and organ is inherited.

In human being crawling, smiling, crying etc are not learned they are the examples of instincts and Fixed action Pattern.

Instinctive or innate behaviour has evolved gradually along with other morphological features through natural selection to enable the animal to fit steadily and gradually in the environment in the best way. Instincts such as hunger, fight, fear, pleasure etc have been wired into brain circuit to ensure survival of the species.

(2) Resistance to the phylogenetic change :— Innate behaviour or fixed action pattern (FAP) are extremely conservative in evolution of a species. It has been assumed that once they have appeared in a species, they are resistant to phylogenetic changes occuring through evolution.

(3) Innate behaviour or instinctive action are characteristically evoked by complex stimuli such as visual or auditory which are known as sign stimuli. Innate complex behaviour pattern is distinguished into stereotyped FAP or consummatory action and the second appetitive or searching behaviour.

The appetitive or searching behaviour needs an external stimuli to respond. A/c to Eckhard Hess (1962) the appetitive behaviour may be characterised by either a motor pattern or an orientation towards the goal or stimuli to which the animal is receptive i.e. smell of

Sight of food, water and mate. most of the consumatory behaviour or FAP are initiated by appetitive behaviour. Appetitive behaviour is variable and it is terminated by the appearance of food and then starts stereotyped FAP i.e eating pattern.

Both the actions are dependent on the level of motivation for that particular behaviour. Example- When a dog is hungry the motivational urge increases for eating. To meet the urge dog starts searching behaviour and after searching food it starts eating (FAP). After consuming food the motivational urge (hunger) drops to zero and both ~~of~~ FAP and appetitive behaviour stop.

(4.) Carrying out of instincts :-

The carrying out of instincts often depend upon the conditions in the internal environment of the organism. In many vertebrates courtship and mating behaviour will not occur unless sex hormones are present in the blood stream. The hypothalamus get stimulated by the presence of sex hormones to promote mating behaviour. The level of sex hormones in the blood is in turn regulated by the activity of the anterior lobe of the pituitary gland. Expression of instinctive or innate behaviour is limited to the development of animal's nervous and muscular system e.g young birds make vigorous flapping movements with their wings in the nest and it is commonly supposed that they are practicing flying.

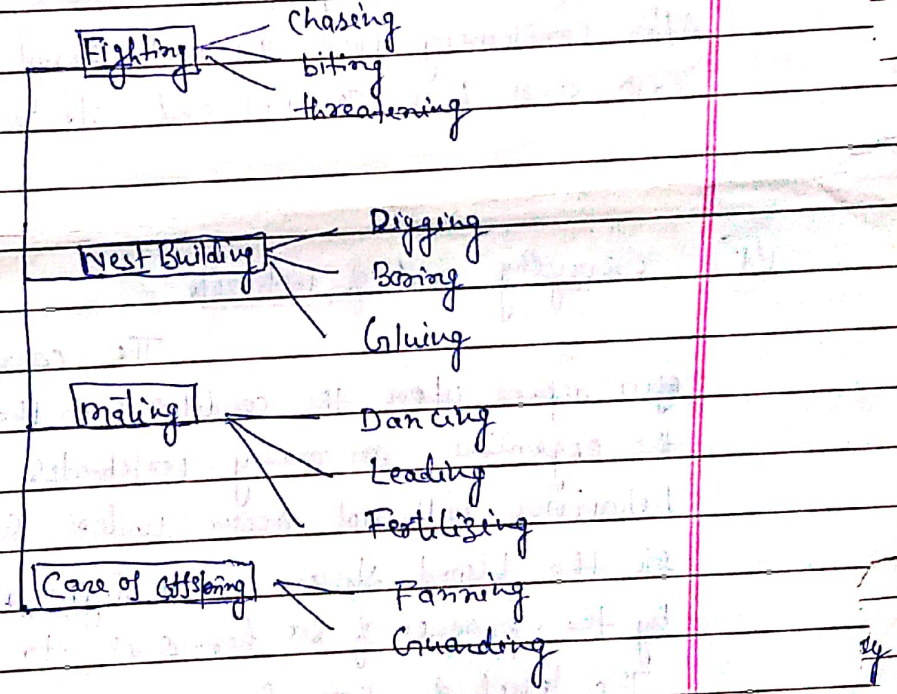
The Performance of behaviour gets better with practice. e.g. young chick have inborn tendency to peck at objects, they peck indiscriminately but after many trials and committing errors chick

gradually improve with practice. These two processes are inseparable, the instinctive behaviour is polished for finer adjustment by learning.

Instincts can be divided into three levels:

1. Major instincts
2. Lower instincts
3. Consummatory acts.

From the following flow chart it is clear that a complex behaviour covers all three levels.



According to Lorenz through the Fixed action Plan the animals releases some sort of internal tension. e.g Ground squirrel in captivity when presented with excess of food may retire to a corner of the cage and go through the motion pretending to bury the food on the iron floor apparently satisfied by the act, even though the food remains in full view. Such a release of FAP is called in vacuo.

Innate releasing mechanism :- Innate releasing mechanism was proposed by Niko Tenbergen in (1951). According to him there is a special neurosecretory mechanism in the brain that release the behaviour in response to specific sign stimuli called IRM. IRM is situated at the hypothesized locus in central nervous system on which sign stimulus act to release FAP. For each FAP there is a separate IRM. ~~which is like a gate~~

Action specific energy (ASE) :- A/c to Lorenz the Action Specific energy for specific energy is constantly being produced in the animal's central nervous system. It is kind of energy required for particular FAP. Although it is continuously produced in the CNS but it remains in check by some inhibitory mechanism until the appropriate sign stimulus release this energy and subsequently FAP.