

UNIT 19

BEHAVIOR

Major Concept

- 19.1 The Nature of Behaviour
- 19.2 Innate Behaviour
- 19.3 Learning
- 19.4 Social Behaviour

Learning Outcomes

Students will be able to:

- Define behavior as the series of activities performed by an organism in response to stimuli.
- Explain relationship between stimuli and behavior.
- Describe the relationship between heredity and behavior.
- Explain, through examples, the biological rhythms.
- Define innate (inborn) behavior.
- Describe examples of innate behavior in terms of taxis shown by unicellular organisms and tropism shown by plants.
- Justify reflexes as a type of innate behavior, by giving examples from man and invertebrates.
- Define instincts and justify these as a type of innate behavior.
- Justify the fact that each species displays its own characteristic instinctive behavior through following examples; migration of salmon, dances of bees, construction of hanging nest by birds, construction of intricate web by spider and mating behavior of stickleback fish.
- Define learning and distinguish between learning and innate behavior.
- Define habituation and illustrate it through the example of squirrels' adjustment in a park.
- Explain imprinting by narrating the work of Lorenz.
- Differentiate habituation and imprinting as reversible and irreversible learned behaviors.
- Describe classical conditioning by narrating the work of Pavlov on salivary reflex in dogs.
- Describe instrumental conditioning (trial-and-error learning) by narrating the work of Skinner on rats' learning.
- Describe latent learning, through the example of a rat in a maze with no reward.
- Interpret Kohler's work on chimpanzee's insight learning to justify that reasoning and planning are involved in the insight learning.

- Differentiate between animal aggregations and animal societies.
- Describe social behavior in terms of hostile and helpful interactions between animals belonging to the same species.
- Describe agonistic behavior and relate it with the maintenance of social order in terms of territories and dominance hierarchies.
- Explain territorial behavior by quoting example of the territories of monkeys and gorillas.
- Explain dominance hierarchy by quoting example of the pecking order of chicken.
- Define altruism and illustrate it through the organization of a honeybee society.

Introduction

Animals and humans continually exhibit a range of behaviours. **Behaviors** include the patterns of environment, sounds and body position exhibited by animals. Behaviour is the scientific study of everything that animals do. The study of behaviour of animals in their natural environment is called **ethology**, while the scientists who study the behaviour of animals in their natural environment are designated **ethologists**. In this unit we will study the nature of behaviour, innate behaviour, learning behaviour and social behaviour.

Interesting Information

Physiological factors are things related to your physical body that affect your thinking, include changes to brain structure due to injuries, extended period of inactivity or physical stress.

19.1 The Nature of Behaviour

Behavior refers to coordinate the responses that an animal makes to stimuli. A **stimulus** is a form of energy that activates a specific type of sensory receptor, either a sensory neuron or a specialized cell adjacent to it. Some behaviour is **simple, automatic response** to environmental stimuli. For example, you “behave” when you slam on the brakes to avoid a car accident. Other types of behaviour, such as the eating behaviour of many animals are quite complex. **Complex behavior** is limited to multicellular animals with a neural network that can sense stimuli, process them in central nervous system (Brain), and send out appropriate motor impulses. We exhibit complex behaviour when we walk and talk, drive a vehicle, interact with our family members and do our jobs. Ethologists observe and interpret the behaviour of animals from a **physiological** rather than a **psychological perspective**.

Interesting Information

Psychological theories assume that human beings exist and process information independently. The reliance of psychological perspective research on S-R (stimulus response) learning models focuses attention on cognitive processes, attitudes, beliefs and so on.

19.1.1 Relationship between Stimuli and Behavior

All living organisms possess **sensors** or **senses** which detect forms of energy from their surrounding then transmit the energy into a signal. The signals may either result in a response (either positive or negative) or being ignored (*i.e.* not important). If response, then may be processes in the brain or it becomes reflex. The example of **process response** is salivations in the oral cavity of dog, when it smells or sees food. The signal of food reaches the brain which interprets the smell as a palatable food to eat. Thus responds by salivating, which is its behaviour to the stimulus.

The example of **reflex response** is withdrawal of hand when touching a hot object. This signal does not have to reach the brain for the interpretation rather unconscious response come from spinal cord.

19.1.2 Relationship between Heredity and Behavior

All behaviours depend on nerve impulses, hormones and other physiological mechanisms such as sensory receptors. Therefore, genes play a role in the development of behaviour because they direct the development of the nervous system. In addition, automatic responses depend on specific pathways within the central nervous system of an organism. These pathways are neural programs and genetically determined. **Neural programs** are part of nervous system at the time of birth or developed at an appropriate point in maturation, resulting in behaviour that are called **innate** or **instinctive** or **inborn behavior**. The capacity to learn is inherited. The moodiness, shyness, intelligence and many other psychological characteristics have very important hereditary roles, these are also affected by environment.

19.1.3 Biological Rhythms and their examples

The behavioral activities of living organisms which take place at regular intervals are called biological rhythms. Biological rhythms may be internal or external.

Internal Rhythm is also called endogenous, which is controlled by internal biological clock, *e.g.* body temperature regulation, menstrual cycle etc.

External Rhythm is also called **exogenous** which is controlled by synchronizing internal cycle with external environment *e.g.* sleep, wakefulness and day/ night cycle.

Biological Rhythms may be: Circadian Rhythm

It is endogenously generated rhythm with a 24 hours cycle. It includes physiological and behavioural changes such as body temperature, sleep, wakefulness.

Diurnal Rhythm

It is a circadian rhythm which is synchronized

Interesting Information

The circadian rhythm is controlled by the **Supra Chiasmatic Nuclei (SCN)**. It is special area in the hypothalamus of the brain.

with the day/ night cycle. It is termed as diurnal, nocturnal and crepuscular animals.

Ultradian Rhythm

It is much shorter than that of a circadian rhythm (e.g. feed cycle).

Infradian Rhythm

It is a biological rhythm, which is more than 24 hours. And can be:

Monthly or Annually Rhythm

Monthly: It includes menstrual cycle in human female.

Annual Rhythm: Annual rhythm is less than or about 365 days e.g. hibernation, reproduction in most animals and migration of birds.

Biological Clock

The biological clock is an internal mechanism by which rhythmic phenomenon occurs and is maintained even without intervention of environmental stimuli. It is still not clear how biological clock controls such rhythm.

19.2 Innate Behavior (Inborn or Instinct Behavior)

The **innate behaviors** are preprogramed within nervous system before birth and are demonstrated in a somewhat complete form, the first time they are exhibited. For example a new born baby, will turn to suckle when touched on the cheek near the mouth. The baby performs this without learning or altering its behaviour based on experience. Innate behaviours are important to the survival of an animal because they help animals stay alive in certain situations and provide adaptive advantages that contribute to its fitness or ability to achieve reproductive success. It is especially beneficial for those animals which have short life span and weakly developed nervous system. All plants exhibit innate behaviour. The pathway of innate behavior is simple and automatic i.e., highly developed nervous system is not involved.

19.2.1 Types of Innate Behavior

Innate behavior is genetically transmitted from parent to their offsprings. There are two primary types of innate behaviours, i.e. orientation and non-orientation.

The **orientation behaviors** are coordinated movement that occurs in response to an external stimulus and of two main types i.e. taxis and tropism. In animals it is called taxis whereas similar behaviour in plants is called tropism.

Taxes

Taxes (singular taxis) is a directional movement, whole animal either moves

Interesting Information

Crepuscular animal appearing or active in twilight (i.e., dawn and dusk) while nocturnal in (dim light) night and diurnal in day light.

toward stimulus or away from stimulus, *i.e.* positive taxis or negative taxis respectively, *e.g.* heat, chemicals (foods) and light. A good example is unicellular protozoan, *Euglena*, who shows positive movement towards dim light and negative movement to intense light. Thus *Euglena* during day time moves under the water where intensity of light is less.

Tropism: (mean to turn)

It is directional growth movement in plants *i.e.* towards or away from stimuli.

phototropism, towards or away from stimulus of light, *e.g.* shoot will grow towards light while roots grows away from light. Root shows positive geotropism or gravitropism (towards soil and gravity) or shoot is negative geotropic and gravitropic. The roots also exhibit positive hydrotropism (towards water). (Fig. 19.1)

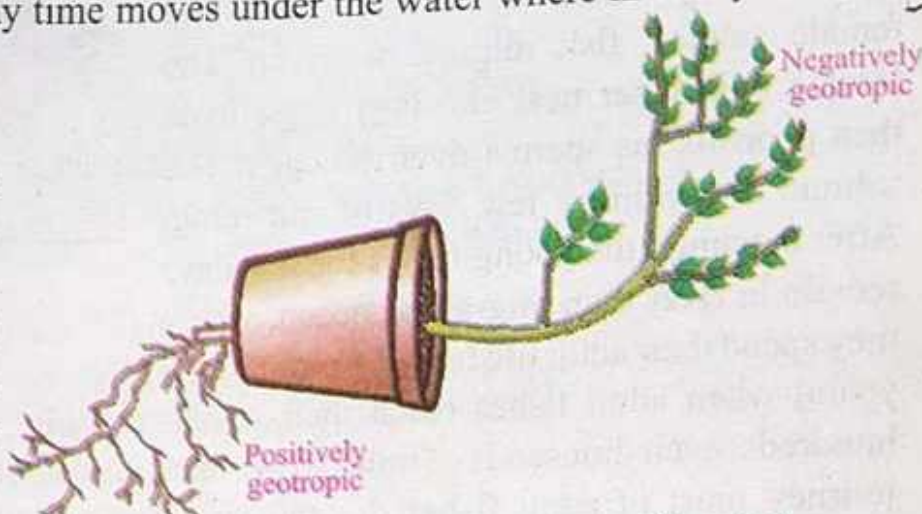


Fig. 19.1: Geotropism (Positive and Negative)

The **non-orientation behaviour** includes reflex and instincts, both do not exhibit particular movement in response to stimuli.

19.2.2 Reflexes or Reflex Action: (L. reflector, to bend back)

It is involuntary, automatic response to changes occurring inside or outside the body. The responses of reflexes may come from unconscious portion of brain such as blinking of our eyes, but most responses come from spinal cord, such as withdrawal of hands when we touch a hot surface.

If a particle of food or a piece of hair enters in your tracheal lining, it will initiate a coughing reflex which cannot be suppressed.

Most insects have simple "startle" reflexes triggered by small disturbances as well as more comprehensive "escape" reflexes triggered by large disturbances.

19.2.3 Instincts: (Fixed action patterns)

This type of innate behaviour is unlearned, inherited fixed action patterns of responses or reactions to certain kinds of stimuli. It is performed without being based upon prior experience *i.e.* in the absence of learning.

In this genetically programmed inflexible behaviour complete body of animal is involved.

Each species displays its own characteristics instinctive behaviour. Some examples of instinctive behaviours are migration of salmon fish, dances of bees,

construction of hanging nest by birds, construction of intricate web by spider and mating behaviour of stickle back fish.

i) **Migration of Salmon**

For spawning the upriver male and female salmon fish migrate to river. The female builds her nest and lays eggs, male then deposits his sperms over the eggs. The salmon die within a few days of spawning.

After hatching, the young fishes for few days remain in river than migrate to ocean, where they spend their adult life (about 6 months to 7

years) when adult fishes reach their sexual maturity, the pacific salmon may swim hundreds, even thousands of miles to get back the river, where they hatched. During this journey most of adult fishes die and only few reach to their breeding ground. The migration for spawning by salmon fish is an example of instinct behaviour. (Fig.19.2)

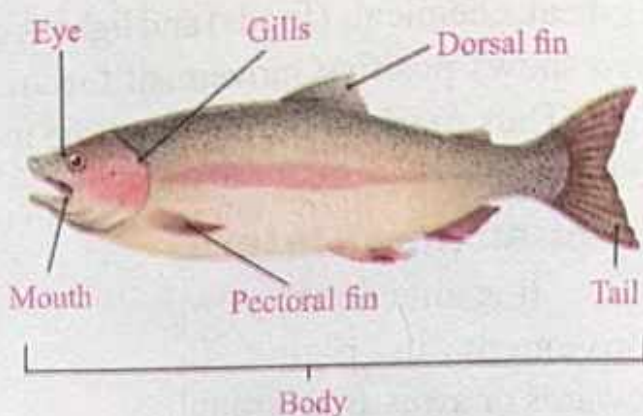


Fig. 19.2: Salmon Fish

ii) **Construction and hanging nest by some birds**

A bird named **Baya weaver** (Genus *Ploceus*, about 100 species) construct nest during breeding season. They nest in colonies of up to 20-30, close to the source of food, water and nesting material. These nests are made by male who are hanging either between two twigs or leaf. Female selects a nest, then male and female are paired. The descendants of these birds exhibit this behaviour in each generation without learning. Thus it is also an example of instinct behaviour. (Fig.19.3)



Fig. 19.3: Baya Weaver (Bird)

iii) **Dances of Bees**

The dances of bees is also an example of instinct. When worker bees return to their hives, they do a dance; which is called the **waggle dance**. They can do the waggle dance without learning, thus it is an example of instinct behaviour. They dance to inform and tell other bees of hives, where

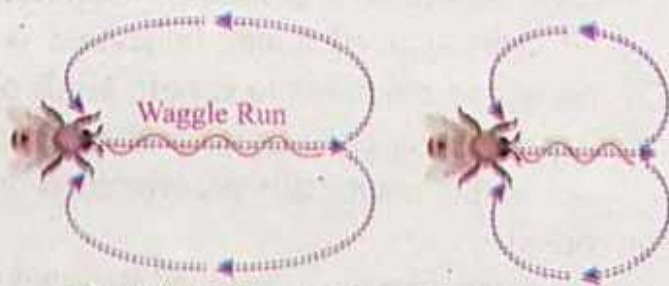


Fig. 19.4: Waggle Dance of Honey Bee

the food is present. (Fig.19.4)

iv) **Construction of intricate web by spider**

Many species of spiders have instinct to construct intricate web. The web spinning is stereotyped, hard coded instinctive behaviour. Any member of a given species of spider will spin the same web given the same environment, without ever having learned the shape of the web. (Fig.19.5)



Fig. 19.5: Spider Webbing

v) **Mating behaviour of Stickleback Fish**

There are about eight species of stickleback fishes, who belongs to five genera. Their reproductive behaviour is highly rationalized. They breed during spring, at which time male becomes suffused with color (red to yellow and orange to black depending on species). (Fig.19.6)

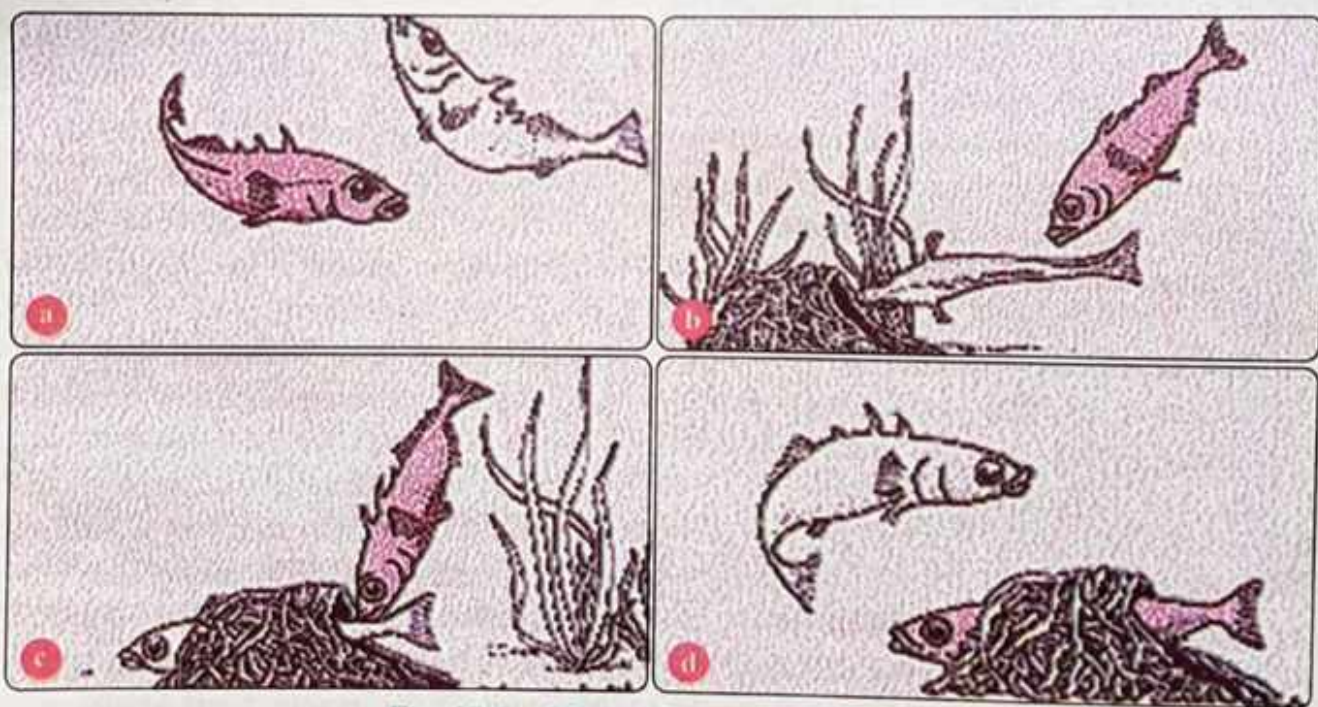


Fig. 19.6: Mating behaviour in Fishes

Male fish after building a nest of plant materials glued together by thread like mucus secretions from his kidneys. After building nest the male coaxes and drives a female into the nest to lay her eggs. He then follows her into the nest to fertilize the eggs. Each female may lay up to 200 eggs, one or more than one female may be chosen by one male. When the nest is full, the male becomes the guard *i.e.* aggressively defends the eggs

from intruders. The male also aerates the eggs, with the help of pectoral fins till hatching, thus parental care is given by the male fish.

19.3 Learning

Learning behaviours; are based on experience, and are not hereditary and inborn. It helps an animal change its behaviour to adapt to changes in environmental conditions. Learning is more prominent in those animals who has comparatively long life span and also have well developed nervous system. It can be grouped into following six categories, i.e., habituation, imprinting, classical conditioning, trial and error learning, latent learning and insight learning. (Table 19.1)

Table 19.1: Differences between Instinctive Behaviour and Learning Behaviour

S.No.	External Respiration	Internal Respiration
i)	It depends on the heredity material which the animal inherits. The animal may be born with the right responses built in the nervous system as part of its inherited structure.	It depends on the environmental influence, but the ability to modify the behaviour depends on the hereditary material.
ii)	Experience has no obvious influence on this type of behaviour.	Experience has an obvious influence on this type of behaviour.
iii)	It depends on the selection mechanism operating during the history of species, so that it helps in the adaptability of the organism in the environment.	It depend on the selection mechanism operating during the history of the individual (during one's life-time) so as to help the organism in its adaptability in the given environment.
iv)	Instinct can equip an animal with a series of responses. This is advantageous for animals with short life spans, and with little or no parental care.	Learning can equip an animal with a set of adaptive responses to its environment. This is advantageous for those animals who has long life spans and have parental care, so that they can modify the behaviour by previous experiences.
v)	Evolves slowly in the species.	Evolves during the life cycle of the individual but the ability of learning depends on the genetic basis of the individual.
	For Example: Honey bees inherit the ability to form wing muscles and wings for flight. They inherit the tendency to fly towards flowers to seek nectar and pollen.	For Example: Conditioned reflex type I, in case of dogs where dogs learn to salivate on ringing of bell alone.

19.3.1 Habituation

In this type of learning, an animal learns by experience not to respond to a situation if the response has neither positive nor negative consequences. For example pigeons and many other birds living in cities learn not to flee from people who pose no threat to them. (This behaviour adaptive and is reversible). Another example of habituation is feeling threatened by **squirrels**, when one in a group feel threatened the other squirrels hear its signal, runs to protective area. If the signal comes from an individual who has caused many false alarms, the signal will be ignored.

19.3.2 Imprinting

It is a time dependent form of learning. It involves exposure to sign stimuli, most often early in development. For instance, in response to moving object and to certain sound. The baby geese imprint on their mother and follow her during a short, sensitive period after hatching. They are **neurally wired** to learn crucial information, identify the individual that would protect them in the months ahead. Normally individual is the mother or father.



Fig. 19.7: K. Lorenz with Geese (Imprinting)

Imprinting occurs among many animals. **K. Lorenz** explained imprinting stimulus in geese when incubator hatched the **gosling (geese)** spent their first few hours with Lorenz rather than with their parents, they imprint with him and followed "Lorenz" from then on. The goslings do not recognize their parents or other adult geese of their own parent. (Fig.19.7)

19.3.3 Difference between Habituation and Imprinting

Habituation is reversible and imprinting is irreversible learned behaviour. Habituation is an example of simple learning behaviour in which an animal gradually stops responding or no longer react to repeated stimuli. While in imprinting learning behaviour is a specialized form of learning which occurs during brief period in young animals after hatching or birth. They are able to learn from their parents so animals early experiences have a big effect on the way it behaves as an adult.

19.3.4 Classical conditioning (Conditioned reflex Type-I)

Ivan Pavlov's classical experiments with dogs are an example of classical conditioning. Dog will salivate just before eating. **Pavlov's dogs** were conditioned to

salivate, even in the absence of food. The dogs did so in response to the sound of a bell that was initially associated with the presentation of food. In this case, the animals learned to associate an automatic, unconditioned response with a novel stimulus that does not normally trigger the response. (Fig.19.8)

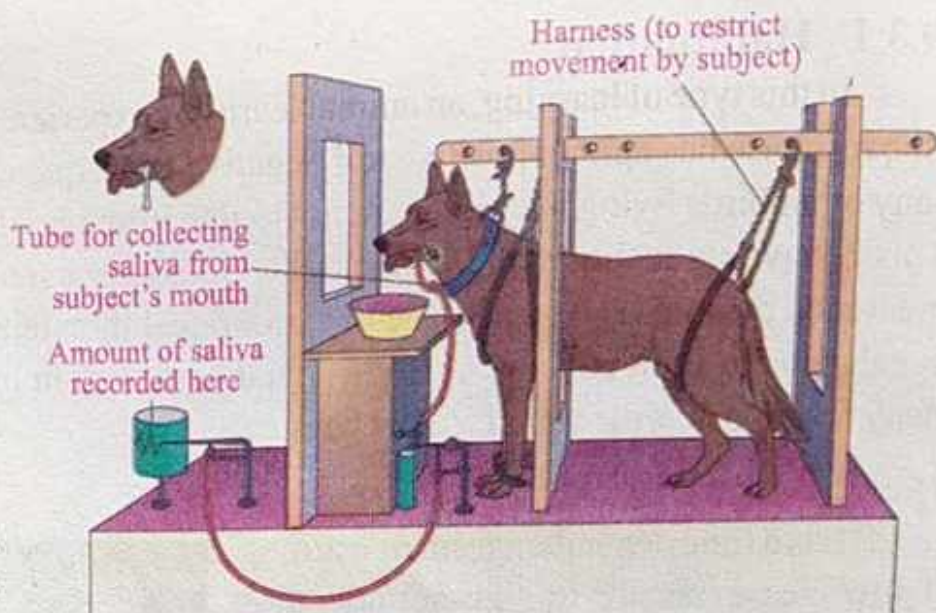


Fig. 19.8: Pavlov Experiment (Classical Conditioning)

19.3.5 Instrumental Learning (Trial and Error or Operant Learning)

In this type of learning behaviour, an animal learns a response to a particular stimulus after many unsuccessful tries.

B. F. Skinner (USA Psychologist) studied operant conditioning in rats by placing them in a specially designed box (also called Skinner box) fitted with levers and experimental devices. The rats in the box feverishly, running this way and that, one of them accidentally press a lever and a piece of food would appear. At first, rat would ignore the lever and continue to move here and there but soon learned that pressing of lever will give food to him. As the rat learns by chance *i.e.* is trial. Thus type of learning has been named "**Trial and Error Learning**". (Fig.19.9)

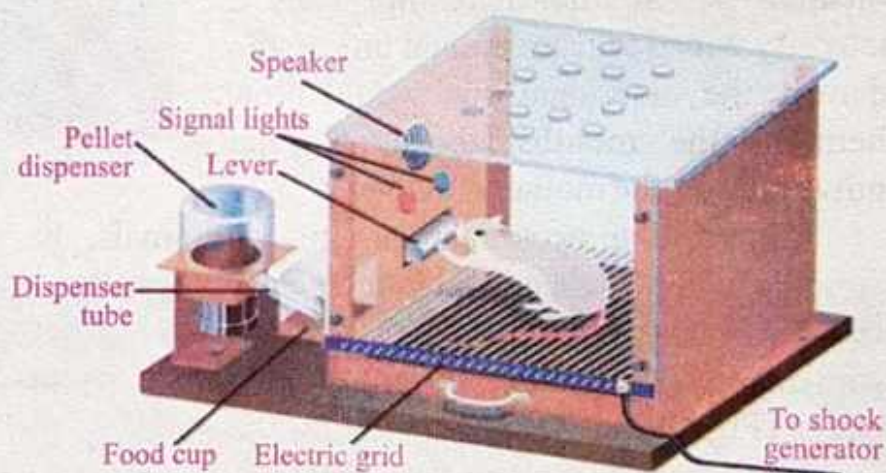


Fig. 19.9: Skinner Box (Instrumental Learning)

19.3.6 Latent Learning (Spatial Learning)

Latent learning is a type of behaviour in which an animal learns a response for a particular stimulus in its routine life without having any reward or punishment. However, sometimes, when the animal is particularly exposed to that stimulus, the animal suddenly response it by quickly recalling the previous experience.

An American physiologist Lashley used a maze. He put a rat in maze and it

wanders about and accidentally get food. Did rat learn anything before getting food in the first experience? If we put the rat in the same maze again, it may directly reach the food, without searching food. That means when the rat was wondering, it did learn something without even the incentive of any reward. (Fig.19.10)



Fig. 19.10: Maze (Latent Learning)

19.3.7 Insight Learning

It is complex type of learning because it requires that animal must respond correctly in first attempt to a particular situation, it has never met before. (Unlike trial and error behaviour). **Kohler, German psychologist** performed many experiments on chimpanzee.

A **chimpanzee** is placed in a cage in which some bananas hang from the ceiling. The chimpanzee cannot reach the fruit, but the keeper has placed some boxes of different sizes in the cage. After a short period of head scratching, the chimpanzee moves the largest box and piles other smaller box over it and climb up to reach the bananas. (Fig.19.11)



Fig. 19.11: Kohler Experiment (Insight Learning)

19.4 Social Behaviour

Social behaviour (living in groups) is a set of interaction among individuals of the same species. It increases the efficiency and effectiveness of the species over the individuals of other species.

19.4.1 Animal Societies and Aggregation

A group of individuals of same species who interact and influence each other's behaviour in different ways is called social group or animal society. The key characteristics of a well-organized society include cooperation and division of labor

among animals of different sexes, age groups or casts. For example, in pack of wolves or hives of bees, some individuals of society are given the duties to find food, some reproduce and rearing, some defence. (Fig.19.12)

Aggregation is a group of animals that may be together but don't interact behaviourally *e.g.* a group of buffaloes or zebras and huge flocks of birds.



Fig. 19.12: Honey Bee

19.4.2 Hostile and Helpful Intraspecific Interaction

Many species of insects (such as ants, bees, termites) and most vertebrates show a variety of hostile or friendly group behavioural activities associated with number of individuals living together.

A good example of hostile and helpful intraspecific interaction is seen among the worker bees. In the bee hives the old and weak worker bees are killed by other worker bees. While helping interaction is observed among these bees as different bees have specific duties to perform over all functions of the hives. The collection and transformation of honey is done by the worker bees. The queen lays eggs which are fertilized by drone bees.

19.4.3 Agonistic Behaviour (Gk, agon, struggle)

This type of social behaviour occurs in **competitive situation**, includes a variety of threats or actual combat that settles disputes between individuals in a population. During these acts animals use enormous energy and cause injury to each other.

Agonistic behaviour is displayed to maintain social order such as territoriality and dominance hierarchy. (Fig.19.13)

a) Territorial Behaviour

The methods by which an animal or group of animals protect their territory from intrusions of other species. Territorial boundaries may be marked by sounds such as bird songs, or scent such as **pheromones**



Fig. 19.13: Gibbon Monkey

secreted by the skin glands of many mammals. A good example of territorial behaviour is recorded in mountain gorillas.

i) **Territorial behaviour in mountain gorillas**

Gorillas are highly social, relatively non-territorial and live in groups called troops. The oldest and strongest adult male called the **Silverback**, is usually the dominant one of the troop. Thus silverback gorilla enjoys exclusive breeding rights with the females. (Fig.19.14)

Adolescent females, are transferred to a different troop once they reach about 8 years of age.

Adolescent males, on the other hand, usually remain in the troop until they can leave and establish a new troop on their own as the silverback gorilla.

Although gorillas typically aren't aggressive, they do exhibit territorial behaviour by standing upright on their two legs and **pounding their chests** in order to intimate whatever threat they have been given. These gestures, however, are more for show and aren't usually violent.



Fig. 19.14: Mountain Gorilla

Skill Analysing and Interpreting

Give examples to interpret that hormones and brain control instincts.

Ans. Hormones can function as a feedback system in reproduction. A good example of a reproductive feedback loop can be seen in ringdoves. Gonadotropins stimulate the gonads of both males and females to produce steroids. Courtship and nest building follow, this increase in gonadal steroids. Rising levels of female progesterone stimulate egg laying and incubation. At this stage, gonadotropins decrease, as do female courtship displays. Males, however, remain responsive to females at this point. After approximately one week of incubation, levels of prolactin increase in both sexes, allowing both males and females to produce a milk-like substance; gonadotropin and steroid levels decrease. When the eggs hatch and the chicks mature, prolactin levels decrease, gonadotropins increase, and the cycle begins again.

Extra Information

Pheromones are chemical messengers like hormones but act outside the body of secreting organism. Pheromone helps for searching of food and also affect many behavioural and sexual responses.

Innate behaviour or instinct is usually in the form of simple reflexes such as removing one hand from a hot stove. The human suckling reflex is a good example of a complex unlearned behaviour.

So we observed from above examples that hormones and brain control instincts.

ii) **Gibbon Monkeys**

Another example of territorial behaviour is seen in **gibbon monkeys**. These monkeys defend their territories with vigorous visual and vocal displays. The voice of mating pair can be heard up to one kilometre distance. In most species males, and in some also females, sing solos that attract mates as well as advertise their territory. The song can be used to identify not only which species of gibbon is singing but the area it is from.

b) **Dominance Hierarchy**

It is a social structure within a group of animals in which certain individuals are dominant over others. The dominant individual able to claim access to better resources in the form of mates, shelter, food and other desirable commodities.

Example: Pecking order in chicken

The pecking order is, literally determined by pecking (bite or strike something with its beaks) when referring to this ordered social structure in chickens, and sometimes other bird species, it is called pecking order. It is a natural process that chickens have to work out among themselves. This order of social dynamics determines the status of individual bird of a flock and their role. (Fig.19.15)



Fig. 19.15: Pecking order in Chicken

19.4.4 **Altruism (Altruistic Behaviour)**

Altruism means acting in the best interest of others rather than in one's own self-interest (some people believe altruism constitutes the essence of morality).

In social insects, e.g. in **honeybees** (*Apis*) female workers are sterile, never produce offsprings, instead they spend their whole lives to look after their siblings (brother / sisters). Especially by helping their sister, queen bee, to reproduce.

Thus they are aiding in the production of new workers, drones and queen.

Science, Technology and Society (STS)

Rationalize why the marine snail, *Aplysia*, has proved very helpful in the studies of neurobiology and the behaviour pattern.

Learning and Memory in *Aplysia*: It is a marine snail and given common name of sea hare by the Ancient Greeks because of their supposed resemblance to the European hare. Juvenile *Aplysia* is attractive for neurobiologists because it has large brain cells (neurons). The cell body of one neuron can measure up to 1 mm in diameter, which makes it relatively easy to study the physiology of these cells to find out how they accomplish learning.

For operant conditioning, one needs a spontaneous behaviour that can be modified by reinforcement, so a reflex is not suitable. Well, about the only thing these animals do in their natural environment is to eat and reproduce. Naturally, their feeding behaviour has received some attention from neurobiologists interested in operant conditioning.

State the role of research in neurobiology in the understanding of behaviour.

Ans. Behavioural Neuroscience, also known as biopsychology, or psychobiology is the application of the principles of biology (in particular neurobiology), to the study of physiological, genetic, and developmental mechanisms of behaviour in humans and animals. It typically investigates at the level of neurons, neurotransmitters, brain circuitry and the basic biological processes that underlie normal and abnormal behaviour. Often, experiments in behavioural neuroscience involve non-human animal models (such as rats and mice, and non-human primates) who has implications for better understanding of human pathology and therefore, contribute to evidence-based practice.

SUMMARY

- Behaviour is the sum of everything that animals do.
- There are two main types of behaviour that is innate behaviour and learned behaviour.
- Withdrawal of hand touching hot object is an example of reflexes.
- Biological clock is an internal mechanism by which biorhythm occurs and maintained even in the absence of the environmental stimuli.
- Circadian rhythms can be classified into diurnal/ nocturnal and crepuscular circadian rhythm.
- Exogenous stimuli are due to changes in the external stimuli while endogenous due to

internal stimuli.

- All plant behaviours is innate in nature.
- Tropisms are growth movements related to directional stimuli.
- Habituation is simplest form of learning and an animal learns to ignore a repeated, irrelevant stimulus.
- The trial and error learning occurs through experience.
- In society, organisms live together in organized groups.
- Altruism means the principle of living for the interest of others.
- The queen bee controls the bees with a chemical known as pheromone.
- Skinner box was designed by B.F. skinner an American psychologist.

EXERCISE

SECTION-I: OBJECTIVE QUESTIONS

Multiple Choice Questions (MCQs)

A. Choose the correct answer.

1. The scientific study of everything animals do, is called:
(a) Pharmacology (b) Behaviour
(c) Reflexes (d) Society
2. The biorhythm, due to internal stimuli is
(a) Exogenous (b) Diurnal
(c) Endogenous (d) Crepuscular
3. The movement of Euglena towards dim light is
(a) Positive Taxis (b) Negative Taxis
(c) Positive Kinesis (d) Negative Kinesis
4. The useful behaviour for animal with short life span is
(a) Instinct (b) Learning
(c) Reflex action (d) Taxis
5. The strongest and oldest adult male gorilla is called
(a) Silverback (b) King
(c) Golden back (d) Beta
6. To solve a mathematical problem is an example of
(a) Instinct behaviour (b) Insight learning
(c) Reflex action (d) Involuntary act
7. A hormone like chemical acting outside the body is called
(a) Pheromone (b) Corticoid
(c) Protein (d) Fatty acid

8. Trial and error learning is also called
 (a) Conditional reflex type I (b) Classical conditioning
 (c) Conditional reflex type II (d) Insight learning
9. Organisms living together in organized groups are said to live in
 (a) Colony (b) Society
 (c) Solitary (d) Dependant
10. The animals having short life cycle depend on
 (a) Learned behaviour (b) Innate behaviour
 (c) Social behaviour (d) Agonistic behaviour

B. Fill in the blanks.

1. A is a form of energy that activates a specific type sensory receptor.
2. The behavioural activities of living organisms which take place at regular intervals are called
3. Hibernation is an example of rhythm.
4. There are two primary types of innate behaviour that is orientation and
5. The movement of plant towards or away from stimulus of light is called
6. The time dependant form of learning involves. Exposure to sign stimuli, most often early in development is known as
7. Kohler, German psychologist performed many experiment on
8. A group of individuals of same species which interact and influence each other behaviour is called
9. Adolescent females are transferred to a different troop once they reach about years of age.
10. *Aplysia*, is marine snail were given the common name of by ancient Greeks.

SECTION-II: SHORT QUESTIONS

C. Give the short answers of the following questions.

1. Define behaviour, ethology and ethologist.
2. Differentiate between internal and external rhythm.
3. Define diurnal and annual rhythm.
4. Write short note on taxes.
5. Write three differences about instinctive and learning behaviour.

6. Describe the dances of bees.
7. Describe construction of intricate web by spider.
8. Write note on habituation.
9. Illustrate altruism.
10. Define territorial behaviour.

SECTION-III: EXTENSIVE QUESTIONS

D. Give detailed answers of the following questions.

1. Discuss in detail biological rhythms.
2. Define innate behaviour. Describe any two types of innate behaviour.
3. Describe migration of salmon and construction of hanging nest by some birds.
4. Explain mating behaviour of stickleback fish.
5. Define learning behaviour. Explain imprinting.
6. Describe trial and error and spatial learning.
7. Explain insight learning and habituation.
8. Define social behaviour, explain agonistic behaviour with example.
9. Describe dominance hierarchy and altruistic behaviour.