Hello students,

this program is for Bachelor of Science,

first years for semester two.

Course title is animal behavior

and course code is ZOG 102.

The title of this unit is introduction

to animal behavior and in this you will

know about the brief profiles of Karl.

Von Frisc h and Ivan Pavlov.

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Working as assistant professor in

zoology at Government College of Arts,

Science and Commerce,

Sanquelim Goa the outline of this module

is contributions of Karl von Frisch

and Ivan Pavlov to the field of

ethology at the end of this lesson.

Student will obtain knowledge of the

observations and experiments carried out

by Karl von Frisch and Ivan Pavlov on animals.

Karl Ritter Vov frisch was a

German Austrian ethologist.

He extensively studied communication

among bees,

which added significantly to the knowledge of

the chemical and visual sensors of insects.

He also carried out work on

hearing and color vision in fish.

Frisch studied aspects of animal behavior,

including animal navigation in

the Carniolan honey bee, *Apis mellifera carnica* ,

a sub

species of the European honey.

In 1919,

he demonstrated that they can be

trained to distinguish between

various tastes and odors.

He found that while the sense of

smell is similar to that of humans,

their sense of taste is not

as highly developed.

He observed that these can perceive

colors and ultraviolet Rays.

Frisch was the 2nd to demonstrate

that honey bees had color vision.

The first being Charles Henry Turner,

which he accomplished by using classical

conditioning to test their vision

Frisch trained bees to feed on a dish

of sugar water set on a colored card.

He then set the colored card in the

middle of a set of grey toned cards.

If the Bees see,

the colored card as a shade of Gray,

then they will confuse the blue card with

at least one of the gray toned card.

Bees arriving to feed will visit

more than one card in the array.

On the other hand,

if they have color vision,

then the bees will only visit

the blue card as it is visually

distinct from the other cards.

A bees color perception is

comparable to that of humans.

But a shift away from the red towards

the ultraviolet part of the spectrum.

For that reason,

bees cannot distinguish red from black.

But they can distinguish the colors white,

yellow, blue and Violet. color

pigments which reflect UV radiation.

Expand The spectrum of colors

which can be differentiated.

For example.

When Flowers which may appear to

humans to be of the same yellow color,

will appear to bees as having

different colors,

that is multicolored patterns

because of their different

proportions of ultraviolet.

His most significant discovery was that bees

have an extensive communication system.

Knowledge about feeding places

can be relayed from bees to bees.

He found that bees communicate the

distance and direction of a food supply

to other members of the colony by

two types of rhythmic movements or dances,

circling and wagging a simple dance called

round dance is used for nearby Flowers.

It means there is a feeding place

near the beehive at 50 to 100 meters,

the waggle dance is used to give the

directions to a source further away.

Other bees follow the Queen as she dances,

keeping in touch with their antennae.

The dance takes a figure of eight,

with variations such as

Angle and vigor of waggles.

The communication is

apparently quite effective.

Frisch was the one to translate

the meaning of the waggle dance.

His theory described in his

1927 book The Dancing Bees,

was disputed by other scientists and

greeted with skepticism at that time.

Only much later was it shown to be

an accurate theoretical analysis.

His research on honey bees was

continued by his student Ingeborg beling.

In 1949,

Frisch’s investigation of a bee’s power of

orientation was significant.

He discovered that bees can recognize

the desired compass direction in

three different ways by the sun by

the polarization pattern of the blue

Sky and by the Earth's magnetic field,

whereby the sun is used as the main

Compass with the alternatives reserved

for the conditions arising under

cloudy skies or within a dark beehive

Frisch’s work on honey bees also

included the study of pheromones.

They are emitted by the Queen

Bee and her daughters,

which maintains the hive’s

Very complex social order. outside

the hive the pheromones cause the

male bees or the drones to become

attracted to the queen and mate with her.

Inside the hive the drones are not

affected by the odour. for having

consecrated his entire life to

experimenting on thousands of bees,

thus discovering a true language

of gestures for communication.

And opening new insights into the

knowledge of insect behavior.

He was awarded the Balzan Prize

for Biology.

A second pioneer in the field of modern

ethology was Ivan Petrovich Pavlov.

He was a, Russian Empire,

and Soviet physiologist.

He contributed to many areas of

Physiology and neurological Sciences.

Most of his work involved

research in temperament,

conditioning and involuntary reflex actions.

Pavlov’s Laboratory housed a full scale

kennel for the Experimental Animals

Pavlov was interested in observing

the long term physiological processes

at the Institute of Experimental

Medicine that Pavlov carried out

his classical experiments on the

digestive glands Pavlov investigated

The gastric function in dogs and

Later in children by externalizing a

Salivary Gland so he could collect,

measure,

and analyze the saliva and what

response it had on food under

different conditions.

He published this work in his book

the Work of the Digestive Glands in

1897 and after 12 years of research.

His experiments earned him,

the 1904 Nobel Prize in

Physiology and Medicine.

He also noticed that the dogs tended

to salivate before food was

delivered to their mouth and set

out to investigate this psychic

secretion as he called

the findings and understandings

of which is called classical

conditioning, the basics of Pavlov's

classical conditioning serve as a historical

backdrop for current learning theories.

The fundamentals of

classical conditioning have been

examined across many different

organisms, including humans.

Pavlov's work with classical

conditioning was a huge influence

to how humans perceive themselves,

their behavior and learning processes,

and his studies of classical

conditioning continued to be

central to modern behavior therapy.

The basic underlying principle of

Pavlov's classical conditioning are also

extended to a variety of settings such

as classroom and learning environments.

Classical conditioning focuses

on using preceding conditions

to auto behavioral reactions.

Pavlov further worked on Reflex

actions involving involuntary

reactions to stress and pain.

Pavlov and his researchers

observed and began the study

of transmarginal inhibition.

The body's natural response of shutting

down when exposed to overwhelming

stress or pain by electric shock.

This research showed how all temperament

types responded to the stimuli the same way,

but different temperaments move through

the responses at different times.

He commented that the most basic

inherited difference was how soon

they reached this shutdown point

and that the quick to shut down

have a fundamentally different

type of nervous system.

These are the references for this module.

Thank you.