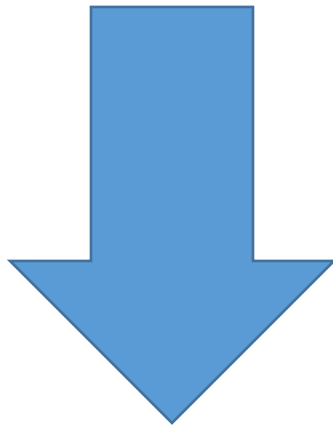


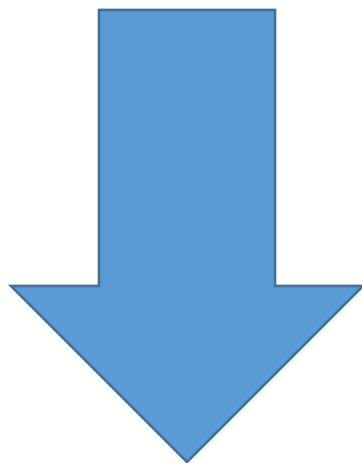
**TOUR AND PROJECT BY
THE STUDENT OF
ZOOLOGY**



VISIT TO NEHERU PARK BY 1st SEMESTER



PROJECT ON BEHAVIOUR AND CHRONOBIOLOGY



LEARNING IN BIRDS



ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher **SRIPARNA RAY** mam as well as our principal who gave me the golden opportunity to do this wonderful project on the topic **LEARNING IN BIRDS**, which also helped me in doing a lot of research and i came to know about so many new things .

I am really thankful to them. Secondly i would also like to thank my parents and friends who helped me a lot in finishing this project within the limited time.

Name of Student

SAYAN HAZRA

4th sem Zoology hon.

INTRODUCTION

The ability to sing has a strong component of learning in most birds. A number of birds are able mimics. A parrot can be taught to say “Polly, want a cracker” and any number of other phrases. A Northern Mockingbird can mimic as many as 30 other species of coexisting birds. The Marsh Warbler in Britain mimics 99 European species and 133 African species that it coexists with on its wintering grounds. A Lyrebird in Australia over 19 years learned to imitate barnyard sounds including pig squeals, a chain rattling, a cross-cut saw, and a howling dog, along with most calls and songs of the local birds! A Crested Lark in Germany learned the whistled commands given to sheepdogs (“Run ahead”, “Fast”, “Halt” and “Come here”).

Although a bird raised in isolation will attempt to sing, its song will be a poor rendition of the song that its father sang to attract its mother.

LEARNING IN BIRDS

- Birds learn to solve complex problems more readily than many mammals in laboratory experiments.
- Learning to count is difficult for most mammals. It took 21,000 trials to get a monkey to learn to tell the difference between a two-note sound and a three-note sound. Birds easily learn to tell the difference. Parakeets and ravens can be taught to count to seven.



- Birds engage in insight learning, a complex mode of learning. A bird is able to learn by observation and imitation of others. Blue Jays can learn to tell edible from inedible caterpillars by watching the reaction of other Blue Jays when they attempt to eat a caterpillar.



- Young birds learn how to take food from their mother just from the day they come out of the egg, which is much faster than any other mammals or animals.
- No bird is born capable of flight, but the instinct to become airborne is strong from birth. Once flight feathers have developed, birds fledge, with much maternal encouragement. Flight isn't instant, but gradually mastered through observation and practice.

- Another nice example is described for Great Tits (a relative of our chickadees) in England. In the 1950's, Great Tits learned to tear the cardboard caps of milk bottles so they could drink the cream. This innovative behavior was quickly passed on to other members of the species. Milk companies had to replace the cardboard caps with stronger metal caps to keep the Great Tits out.

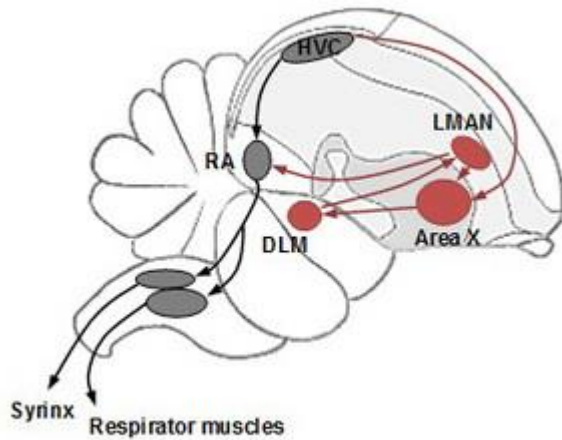


The Development of Birdsong :

- The sounds that birds produce can be categorized into two distinct classes: calls and songs. A call is usually a short and simple vocalization that signals flight or danger and is produced throughout the year. A song tends to be a long and complex vocalization produced during a breeding season. Songs are organized into several phrases which consist of series of syllables. Syllables, in turn, are made up of a collection of single notes. Each individual bird has its own song repertoire, which consists of different versions of a song, called a song type. There is large variation in repertoire size between species.

Species also vary in when they can learn new songs. Species such as white-crowned sparrows have a short period of a few months after hatching when they can learn songs (called close-ended learners). In contrast, open-ended learners like European starlings and canaries can learn and add new songs to their repertoire throughout their lives, usually on a seasonal basis. Which sex sings tends to depend on who competes to breed. In many species, only males sing; in others, both males and females sing equally in duets.

- Birdsong is controlled by discrete brain regions that are interconnected. There are two such neural pathways: the motor pathway, necessary for song production, and the anterior forebrain pathway (AFP), necessary for song learning and plasticity. In the motor pathway, HVC projects onto RA. RA then sends axons to two separate motor nuclei whose motor neurons innervate the vocal organ in birds, called the syrinx, and the respiratory muscles to produce song while coordinating breathing. The AFP includes Area X, DLM and LMAN. LMAN converges with the motor pathway at RA.



Studies deactivating parts of the neural circuit for birdsong via lesions highlight functions of the AFP. While lesions of LMAN, DLM, or Area X in adults have little effect on already-learned songs, lesions of these areas before song crystallization lead to abnormal songs. Further studies have shown that lesions of Area X in juveniles prevent crystallization whereas lesions of LMAN in juveniles result in permanently crystallized, atypical songs. Lesions of LMAN, in fact, make their songs truly stable. It prevents adult birds from learning new songs and also shields already-learned song from deteriorating after deafening. Thus, the AFP facilitates song plasticity in both juveniles and adults, possibly via RA where the AFP and the motor pathway converge.

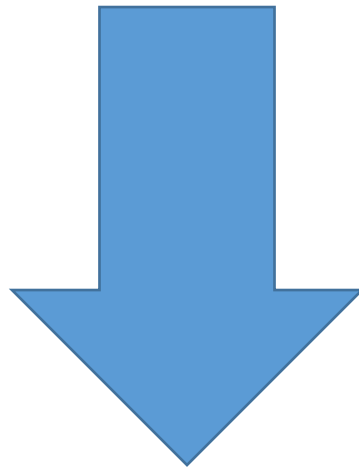
- There are striking similarities between the development of birdsong and human speech. In both cases, dialects and languages are culturally transmitted during a sensitive period of learning. For instance, similar to the sensory phase in song learning, distinguishing and producing sounds of the new language is difficult without an early exposure to the foreign language — before reaching early adolescence in humans. Both birdsong and human speech are controlled by discrete neural circuitry and auditory feedback is essential in normal learning. These recent discoveries demonstrate that birdsong constitutes an excellent model for exploring the molecular basis and behavioral development of human speech.



CONCLUSION

I briefly review this topic on social learning in birds, concluding that strong evidence exists mainly for predator recognition, song, mate choice and foraging. The mechanism of local enhancement may be more important than imitation for birds learning to forage, but the former mechanism may be sufficient for faithful transmission depending on the ecological circumstances. Early learning causes a shift in the foraging sites used by the tits in the direction of the foster species. The shift in foraging niches was consistent across seasons, as showed by an analysis of prey items, and the effect lasted for life. The fact that young birds learn from their foster parents, and use this experience later when subsequently feeding their own offspring, suggests that foraging behaviour can be culturally transmitted over generations in the wild. It may therefore have both ecological and evolutionary consequences.

TOUR TO SANTINIKETAN



2022

Place :- Santiniketan, Dept of Zoology
Visva Bharat

Date :- 07/09/2022 - 08/09/2022

Teachers :- Sagarika Mukherjee
Md. Shamim Akhtar

Students :-

Maitrayee Roy	—	5 th	Sem	(Hons)
Sudeshna Nandy	—	"	"	
Homa Kumari	—	"	"	
Bakul Keen	—	"	"	
Ankita Teewary	—	"	"	
Danish Ansari	—	3 rd	Sem	(Prog)
Akas Das	—	"	"	"
Aditya Mondol	—	"	"	"
Dhrubojoyoti Nath	—	5 th	Sem	(Hons)
Md. Zafar Alam	—	"	"	"

Objectives :-

- To come across new instruments
- To get the opportunity of ~~drawing~~ knowing various research works running at that department.
- To get demonstration of the instruments from esteemed professionals.



পশ্চিমবঙ্গ সরকার
গম শিল্প অধিক
কৃষি দপ্তর
সেরিকালচার

EDUCATIONAL TOUR



GPS Map Camera



Bolpur, West Bengal, India

Sriniketan Sericulture Composite Complex, Bolpur, West Bengal

731204, India

Lat 23.681493°

Long 87.672672°

09/09/22 11:10 AM GMT +05:30





GPS Map Camera

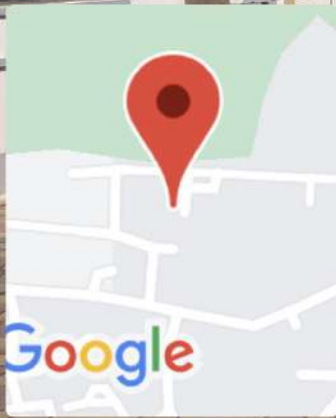
Bolpur, West Bengal, India

Bolpur Youth Hostel, Bolpur, West Bengal 731204, India

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Long 87.672672°

09/09/22 09:22 AM GMT +05:30





GPS Map Camera

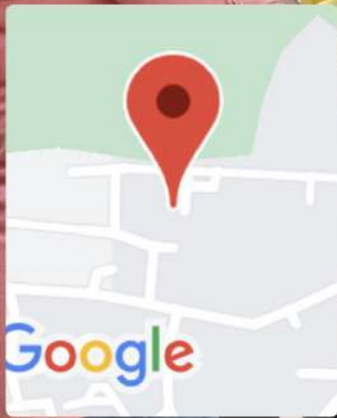
Bolpur, West Bengal, India

Zoology Department, SIKSHA BHAVANA Road, Bolpur, West
Bengal 731204, India

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Long 87.672672°

08/09/22 12:40 PM GMT +05:30





 GPS Map Camera

Bolpur, West Bengal, India

Physics Department, SIKSHA BHAVANA Road, Bolpur, West
Bengal 731204, India

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Long 87.672673°

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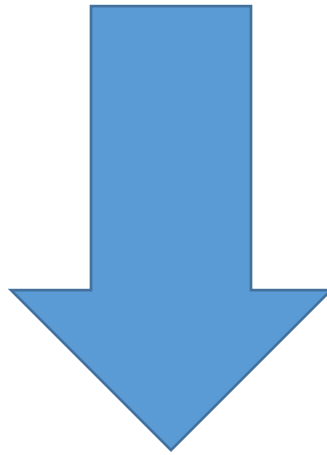


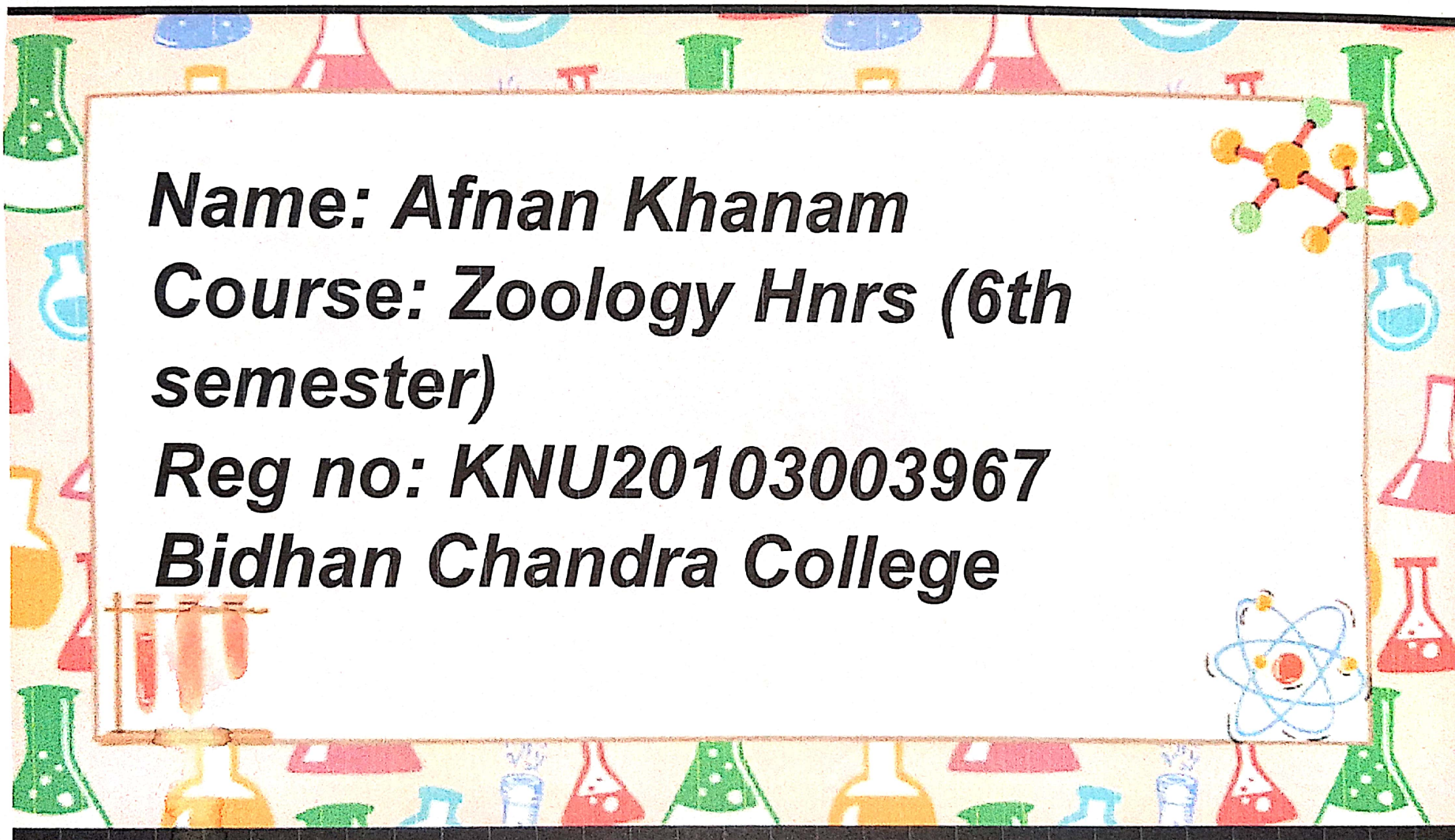
VISIT TO POULTRY FARM

ON 23.02.23



PROJECT ON AQUATIC BIOLOGY





Name: Afnan Khanam
Course: Zoology Hnrs (6th semester)
Reg no: KNU20103003967
Bidhan Chandra College

Sewage Treatment



25/4/23

Urban Waste Water

- Sewage:

Wastewater produced by residential and commercial establishments and discharged into sewers

- What is in it?

- Domestic waste
- Industry
- Rainwater run-off

- Waste Water Treatment Plants

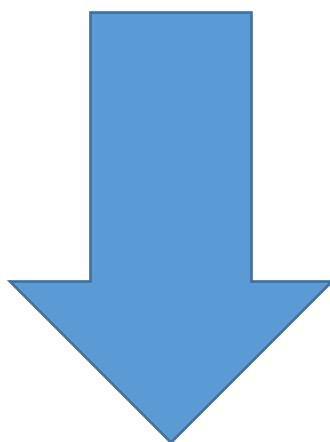
Treatment

- Pre-treatment
- Primary treatment
- Secondary treatment
- Tertiary treatment
- Sludge treatment
- Sludge disposal

Pre-treatment

- Grit traps
 - Slow down flow rate to allow coarse grit to settle out
- Screens
 - Remove large debris (large organic matter)
 - Remove suspended solids
- Mechanical
- Landfill or recycled

VISIT TO BARAKAR RIVER



No.

PAGE NO.

DATE

Folder



Copy...

Teacher's Signature.....



Scanned with OKEN Scanner

Name - Bhaskar Kundu.

Reg no - KNU20103003822

Sub - Zoology.

Sem - VI

(Barakar River)

Page No. 1

Date. 18/5/2023

The Barakar River is the main tributary of the Damodar River in eastern India. Originating near Padma in Hazaribagh district of Jharkhand it flows for 225 km (140 mi) across the northern part of the Chota Nagpur plateau, mostly in a west to east direction, before joining the Damodar, near Disbargarh is Asansol, Bardhaman district of West Bengal. It has a catchment area of 6159 square km. The main tributaries, Barsohi and Usri, flow in from the south and north respectively. Apart from the two main tributaries some fifteen medium or small streams join it.

The Barakar skirts the northern portion of Parasnath Hills, 1350 meters (4430 ft) above sea level, the highest hill in the region, located in Giridih district of Jharkhand and a centre of Jain Pilgrimage.

(Location)

Country	India
State	Jharkhand, West Bengal.

(Physical characteristics)

Source	Padma, Hazaribagh.
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Teacher's Signature



Location

Hazaribagh district, Chota Nagpur plateau, Jharkhand.

Length

225 km (140 mi)

(Basin features)

Tributaries

- Left Usri River.
- Right Barsoti River.

• Floods :- The river flows in all fury during the rains in its upper reaches and has washed away two bridges constructed successively on the Grand trunk Road. The great stone bridge across the ~~the~~ river near Barhi, in hazaribagh district, built around 1848 was washed away in 1913, after a fall of 250 mm of rain in 24 hours. The narrow iron bridge which is built to replace it, withstood the strains of troop movement during the second world war, but gave away in 1946, with another great flood. A new bridge built in 1950s has withstood the fury of the river.

Teacher's Signature

Dams & power Stations :-

Tilaiya - DVC's first dam, Tilaiya Dam, was across the Barakar at Tilaiya, in Hazaribagh district of Jharkhand, now in Koderma district of Jharkhand. It was inaugurated on 21 February 1953. The dam is 366 meters long and is 30.18 meter high from the river bed level. Tilaiya hydel power station is located on the left bank of the river Barakar.

Maithon - DVC's second dam was across the Koner, a tributary of the Damodar, in Hazaribagh district and third was across the Barakar at Maithon in Dhanbad district of Bihar, now Jharkhand. The rivers form the boundary between West Bengal and Jharkhand area. The dam was inaugurated on 27 September 1957. The dam is 4860 meters long, and the concrete dam is 43.89 meters high above the river bed level. The unique feature of Maithon is that the hydel power station is located underground in the left of the river and is the first of its kind in India. About 13 km downstream from Maithon, the Barakar joins the Damodar at Dishergarh.

Teacher's Signature

Fisheries :-

The reservoirs at Tilaiya and Maithon, provided scope for development of fisheries. Efforts were made to introduce carp once the water accumulated behind the dams but the results have not been commensurate with the efforts.

I. Ray
23/5/23

EXAMINED
K. K. Maipall
Signature 21.7.23

Teacher's Signature