
Project/Internship

INTERNSHIP

TOPIC

Nesting pattern of birds

Session: 2022-23

Submitted by: Sanskriti Joshi

BSc II year

Work done in

Sri Sathya Sai College for Women, Bhopal

Under the supervision of: Dr. Sunita Yadav



SRI SATHYA SAI COLLEGE FOR WOMEN BHOPAL

Sanskriti Joshi
11/4/2023

DECLARATION

I Poornima Singh student of BSc II year of Sri Sathya Sai College for Women, Bhopal declare that the internship report entitled "Grassland birds of van Vihar national park habit, habitat and role in ecosystem" has been carried out by me in SSSCW. No part of this was previously presented for another degree or diploma at this or any other institution.

Date: 01/04/2023

Name: Sanskriti Joshi

Place: Bhopal

Class: BSc II year

APPROVAL LETTER

I Dr. Sunita Yadav certify that the internship report submitted by Sanskriti Joshi is partial fulfillment of the curriculum required for the degree of Bachelor of Science, is a record of the candidates own work carried out by her under my supervision and guidance. This report is submitted to Sri Sathya Sai College for Women, Bhopal after my approval.

Date: 01/04/2023

Place: Bhopal

Supervisor:

Dr. Sunita Yadav

Department of zoology

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to Dr. Asha Agarwal, the Principal, for providing me with the opportunity to do my internship. I would also like to extend my special thanks to my teacher, Dr. Sunita Yadav, for her valuable guidance and support.

In addition, I would like to thank Dr. Renu Srivastav and the lab assistant, Mrs. Neelu Srivastav. I am very grateful to our Head of Department, Dr. Rupa Guhanandi, for providing us with permission and her support in completing our internship. I am also thankful to Shree Mohammad Khalique Founder & CEO and Dr. Sangeeta Rajgir Secretary, Bhopal Bird Conservation Society, Bhopal for their supervision and companionship throughout our internship.

Date: 01/04/2023

Sanskriti Joshi

Place: Bhopal

BSc II Year

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- Challenges in project work
- Recommendations based on findings



Yellow-green birds in a tree



Yellow-green bird on a nest

Topic

Date :

Chapter - 1

1 Introduction:-

For a wide array of species ornithologists and birdwatchers have studied and documented many aspects related to nesting biology.

Such as : pair formation, courtship, copulation, nest availability, nest site selection, nest building, nest maintenance, clutch size, incubation period, hatching success, fledging, survival, growth, parental care and parent off-spring behaviour: moult, nest re-use and population dynamics.

Nesting biology is a highly significant aspect of a bird's life history and is directly related to ecological aspects such as habitat selection and selection, as well as evolutionary aspects such as reproductive success and sexual selection.

The nests that birds make are extremely varied, from swiftlets nesting in caves, grikes and jacanas.

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Zoo/Bi

B Sc. I Year

B Sc. II Year

Prnc Zoo (S
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are

American Robin



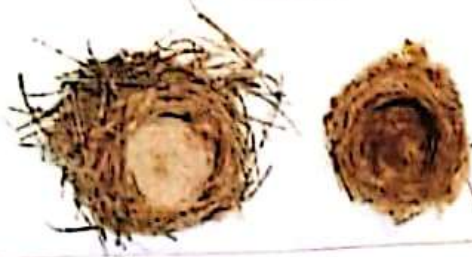
Yellow Warbler



Savannah Sparrow



Carduelis



Date :

pic

esting on open water bodies or marshes.
bblers nesting in tall grass, mound-
nesting megapodes, primary or secondary-
cavity- or hole nesting birds such
as wood-peckers, kingfishers, owls,
bee-eaters, and hornbills.
ground nesters like lapwings and larks,
birds that breed on cliffs, in
houses and on rooftops, to brood
parasites like many cuckoos that do not
build nests but lay their egg in other
birds nests.

Objectives:-

The primary function of nests is to provide
a suitable location for parents to
lay their eggs and/or raise their
offspring.

They provide a safe warm place for
parent birds to care for their
eggs and chicks, hidden from
predators and mainly to
be stay protected from
the bad weather.



Background :-

The nesting season is a particularly vulnerable time for birds as their eggs and young are nearly defenceless against predators, although parent birds may go to substantial lengths to protect nests and young through defensive, or evasive, behaviours and by careful selection of nest sites in secure or hidden locations.

Literature Review :-

In the case of nesting birds, field research or disturbances due to human observers, such as ecotourists and birdwatchers, may lead to changes in nesting habitat, nest site availability and safety, increases exposure and stress, compromise the survival of chicks and adults, cause nest desertion or modify predator behaviour and predation rates, all of which may affect nesting birds in ways that are negative, neutral or even positive.

Topic

Date :

Detail of work Place :-

We had done our internship at the Van Vihar National Park, Bhopal.

It is the characteristic combination of rich wetland areas, meadows, pools of water in different places, rugged slopes, mixed bamboo vegetation along with grass covered plateau and areas of mixed plantations support the rich floral & faunal diversity in the area. It was declared a national park in 1979. It covers an area of about 4.45

km². It has a status of a national park and is developed and managed as a modern zoological park, following the guidelines of the Central Zoo Authority. Animals are kept in near natural habitats. Most animals are either orphaned and brought from various parts of the state or are exchanged from other zoos.

Chapter - 2

Project Methodology :-

Thirteen bullfinch nest were collected September 2014 after the known end of





the breeding season. All birds constructs nests in which to lay eggs and/or raise offspring. Traditionally, it was thought that natural selection and the requirement to minimize the risk of predation determined the design of completed nests. However, it is becoming increasingly apparent that sexual selection also influences nest design. This is an important development as while species such as bowerbirds build structures that are extended phenotypic signals whose sole purpose is to attract a mate, nests contain egg, thereby suggesting a direct trade-off between the conflicting requirements of natural and sexual selection.

Information details :-

A bird nest is a place and structure where birds lay their eggs, incubate them, and attended by a pair, rear the nestlings. Nest can be built and attended by a pair or multiple individuals working together in a cooperative breeding system.



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Bird nest can be simple depression on the ground or an elaborate dome, all of which protect the eggs and young from the elements and detection by predators.

Because birds descended from dinosaurs called theropods, birds and reptiles show similarities in their nesting biology.

Analysis of the information:-

The most common type of nest built by birds is the cup-shaped nest, but there are many shapes, sizes, substrates, and materials that birds use to make their nests. The shape, material used and nest positioning respond to the birds' basic needs: to protect the eggs and chicks from inclement weather and, perhaps more importantly from the predators.

The choice of a nest-site and its construction are important because this will be where the egg-laying, incubation, and caring for the young activities occur.





Inferential modelling and analysis :-

Studies have suggested that birds and mammals select materials needed for nest building based on their thermal or structural properties, although the amounts or properties of the materials used have been recorded for only a very small number of species.

Some of the behaviours underlying the construction of nests can be indirectly determined by careful deconstruction of the structure and measurement of the biomechanical properties of the materials used.

The choices of the materials within different parts of a nest presumably reflect decisions made by the building bird and appear to have a structural role.

Recent studies have tried to determine the factors that affect nest construction both using captive species and by examining nests from the field.





Birds nest can have various roles but all act as the location for incubation, so at least have to serve to hold and support the incubating bird and its clutch of eggs. Nest construction is species specific and the use of material varies between different parts of the nest.

Challenges On the Project Work:-

- Too much time were spend on making the reports.
- There was also a lot of difficulties in the data collection
- Fear of the consequences and misunderstanding of data.
- Unsure how to improve performance based on reports
- The biggest challenge will be getting to know the members of the respective teams.



Recommendations based on findings:

Recommendations should directly respond to key findings arrived at through data collection and analysis.

You should wear dark colours like green, black, forest like clothes while bird watching to get to know about them better and about their habitat and nest.

You should remain calm and quite while observing them, their sounds and their callings.

There should not be any large no of groups, you should go a spread in a small groups so, that the bird's do all. fly of the fears and

SRI SATHYA SAI COLLEGE FOR WOMEN

PROJECT/ Internship

Internship

Topic → Nesting Patterns of
Birds in Van Vihar
National Park.

P - 1

Name → Sanskriti Joshi
Course → B.Sc II year.

Submitted to :-
Dr. Sevita Yadav

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- Introduction & scope
- Details of the work site
- Plan of Project work
- Purpose & Relevance.

Introduction & scope :-

Introduction :-

For a wide array of species ornithologists and birdwatchers have studied and documented many aspects related to nesting, biology such as: pair formation, courtship, copulation, nest availability, nest site selection, nest building, nest maintenance, clutch size, incubation period, hatching success, fledging survival and growth; parental care and parent-offspring behaviour; moult, nest re-use and population dynamics.

Nesting biology is a highly significant aspect of a bird's life-history and is directly related to ecological aspects such as habitat selection and selection, well as evolutionary aspects such as reproductive success and sexual selection. The nests that birds make are extremely varied from swiftlets nesting in caves, grebes and jacanas nesting on open waterbodies or marshes, babbler nesting in tall grass, mound-nesting megapode primary or secondary cavity or hole-nesting birds such as woodpeckers, kingfishers, owls, bee-eaters, and hornbills, ground nesters like lapwings and larks, birds that breed on cliffs, in

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Topic

Date

as ecotourists and birdwatchers, may lead to changes in nesting habitat, nest site availability and safety, increase exposure and stress, compromise the survival of chicks and adults, cause nest desertion or modify predator behaviour and predation rates, all of which may affect nesting birds in ways that are negative, neutral or even positive.

Scope:-

The primary function of nests is to provide a suitable location for parents to lay their eggs and/or raise their offspring. The nest facilitates efficient warming of the eggs by an incubating parent, usually the female. The curvature of the nest insures that the eggs nestle together to occupy the least possible area.

Place of Project Work:-

The project had been done at the Van Vihar National Park, Bhopal.

It is situated almost midst of the B city, the capital of Madhya Pradesh state, easily approachable by means of each of transportation such as Air and Road ways.

It lies between $23^{\circ}20'89''$ latitude and $77^{\circ}15'14''$ N to $77^{\circ}15'10''$ S longitude.

Details of the work site

Background

Aquaria and zoos are the most common conservation paradigms in context of endangered and threatened species. Due to habitat destruction, illegal poaching, hunting, population explosion, the world has lost most of the wild species and some become threatened and endangered species.

In this context, Vanvihar National Park is one of the appreciable efforts to conservation wild species, situated in the heart of Bhopal city, 445 hectare degraded hillock along with private village land was initiated in 1980 and finally notified as National Park in 1983.

It was declared as national park vide M.P. Govt. Notification number 15-1-83 (ten)-2 dated 18-2-83, effective from 26.1.83. For this purpose an area of 445.21 hectare was made available and further developed following the guidelines of CZM.

Historical Background:-

In 1980, the state govt. of Madhya Pradesh decided to formulate the VNVP, around 1000 hectare of land was proposed by a committee of experts.

Legal Status:-

Most of the land of VNVP is either Govt. revenue land or private village and agriculture land. Forest department acquired land by paying the desired compensation to the villagers and the revenue departments.

Geographical Features :-

terrain → The whole National Park makes catchment for big Bhopal lake. Around 65-75% of the park area is covered by hills and plateau rest of the terrain is plain.

Geology, Rock and Soil → The geology of the park is comprised of Deccan trap underlying basaltic rocks, which are exposed on cliffs. These basaltic rocks are red brown laterite of vidhyan formation of Bhandar Sandstone.

Climate →

Since, the park lies in the heart of Bhopal town, thus the climate of VNVP does not differ much from it. However, the big lake does effect the local climate of this area by lowering temp. around 1 to 1.5 degree celsius, general climate of the whole area is good and mainly southwest rains governs it.

Temperature →

The temp. of Bhopal city is also applicable to VNVP. It is typical tropical weather area, where temperature goes down in month of December-January and become high in month of April-June.

Plan of Project Work :-

Nests provide a safe place for eggs and young birds to develop. Bird nests are extremely diverse, although each species typically has a characteristic nest style. Some birds do not make nests at all and instead lay their eggs in a simple scrape in the ground. Other birds construct nests from natural materials, such as grass, leaves, mud, lichen and fur, or from human-made materials like paper, plastic or yarn. Nests can be found almost anywhere: on the ground, in trees, in burrows, on the sides of cliffs, in and on human-made structures, etc. Females typically build nests, but sometimes both parents or just the male will build it.

Purpose & Relevance :-

Many species of bird conceal their nests to protect them from predators. Some species may choose nest sites that are inaccessible or build the nest so as to deter predators. Bird nests can also act as habitats for other inquiline species which may not affect the birds directly. Birds have also evolved nest sanitation mechanisms to reduce the effects of parasites and pathogens on their nestlings. Some aquatic species such as grebes are particularly careful when approaching and leaving the nest, often using their bills to reveal the location. Some species will use twigs or leaves to cover up the nest prior to leaving.

SRI SATHI SAI COLLEGE WOMEN

Internship

P-2

Topic → Nesting Pattern of
Birds of
Vihar National

Submitted by:-
Ankita Joshi
Sc. II year

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Dr. Su

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- ① Project Methodology
- ② Details of Information Coll
- ③ Literature review
- ④ Progress of work

Date :

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Project Methodology:-

All birds construct nests in which to lay their eggs and/or raise their offsprings. Traditionally, it was taught that natural selection and the requirement to minimize the risk of predation determined the design of completed nests. However, it is becoming increasingly apparent that the sexual selection also influences the nest design. This is an important development as wild species as well as bowerbirds build structures that are extended phenotypic signals whose sole purpose is to attract a mate, nests contain egg, thereby suggesting a direct trade-off between the conflicting requirements of natural and sexual selection.

Information Details :-

A bird nest is a place and structure where birds lay their eggs, incubate them, and attended by a pair rear the nestlings. Nest can be built and attended by a pair or multiple individuals working together in a cooperative breeding system.

A bird nest can be simple depression on the ground or an elaborate hanging dome, all of which protect the eggs and young ones from elements and detection by the predators.

Literature review :-

In the case of nesting birds, field research or disturbances due to human observers, such as ecotourists and

Topic

Date :

Birdwatchers, may lead to changes in nesting habitat, nest site availability and safety, increases exposure and stress, compromise the survival of chicks and adults, cause nest desertion or modify predator behaviour and predation rates, all of which may affect nesting birds in ways that are negative, neutral or even positive.

① Progress of work :-

Nests provide a safe place for egg and young birds to develop. Bird nests are extremely diverse, although each species typically has a characteristic nest style. Some birds do not make nests at all and instead lay their eggs in a simple scrape in the ground. Other birds construct nest from natural material such as grass, leaves, mud, lichens, and

Topic

Date :

fur, or from human made materials like paper, plastic, and yarn. Nests can be found almost anywhere - on the ground, in trees, in burrows, on the sides of cliffs in and on human-made structures, etc. Females typically build nests, but sometimes both parents or just male will build it.

SRI SATHYA SAI

COLLEGE FOR
WOMEN

Internship

P-3

Topic → Nesting Pattern of birds
Van Vihar National Park

Submitted by:-

Sanskriti Joshi
B.Sc II year

Submitted to

Dr. Sunita

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Date :

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- Details of Work
- adjective of information
- Methodology
- Challenges faced in project Work

Details of work:-

For a wide array of bird species, ornithology and birdwatchers have studied and documented many aspects related to nesting biology such as:- pair formation, courtship, copulation, nest availability, nest site selection, nest building, nest maintenance, clutch size, incubation period, hatching success, fledgling survival and growth, parent care and parent offspring behaviour, moult, nest-reuse and population dynamics.

Nesting Biology is a highly significant aspect of a bird's life history and is directly related to ecological aspects such as habitat selection and survival, as well as evolutionary aspects such as reproductive success and sexual selection.



Adjective of information :-

A bird nest is the spot in which a bird lays and incubates its egg and raises its young. Although the term popularly refers to a specific structure made by bird itself - such as the grassy cup nest of the American robin or Eurasian blackbird, or the elaborately woven hanging nest of the Montezuma Oropendola or the village weaver - this is too restrictive a definition. For some species, a nest is simply a shallow depression made in sand, for others, it is the knot-hole left by a broken branch, a burrow dug in the ground, a chamber drilled into a tree, a snow rotting pile of vegetation and earth, a shelf made of dried saliva or a mud dome with an entrance with a tunnel.

Methodology :-

Birds construct nest to lay their eggs and/ or raise their young ones. Traditionally it was thought that natural selection and the requirement to minimize the risk of predators determined the design of completed nests. However, it is becoming increasingly apparent that the sexual selection also influences the nest design. This is an important development as wild species such as bowerbirds build structures that are extended phenotypic signals whose sole purpose is to attract a mate, nests contain egg, thereby suggesting a direct trade-off between the conflicting requirements of nature and sexual selection.

Challenges faced in Project Work

- Too much time were spent on making the reports.
- There was also a lot of difficulties in the data collection.
- Fears of the consequences and misunderstanding of data.
- Unsure how to improve performance based on reports.
- The biggest challenge will be getting to know the members of the respective teams.

INTERNSHIP

ON

'Museum Keeping Techniques

Internship Report Submitted for Partial Fulfillment of The Degree In

Bachelor of Science

Session: 2021-2022

Submitted by: Poornima Singh

BSc I year

Work done

in

Regional Museum in Natural History, Bhopal

Under the supervision of: Dr. Sunita Yadav



Meera
27/4/22

SRI SATHYA SAI COLLEGE FOR WOMEN, BHOPAL

(Affiliated to Barkatullah University, Bhopal)

DECLARATION

I Poornima Singh student of BSc I year Sri Sathya Sai College for Women, Bhopal declare that the Internship report entitled "Museum Keeping Techniques" prepared by me is my personal authentic work. This work is original and has not been submitted to any other degree or diploma or any other university.

Date: 20/4/22

Name: Poornima Singh

Place: Bhopal

Class: Bsc. I year

APPROVAL LETTER

I Dr. Sunita Yadav certify that the internship report submitted by Poornima Singh is partial fulfillment of the curriculum required for the degree of Bachelor of Science, is a record of the candidates own work carried out by her under my supervision and guidance. This report is submitted to Sri Sathya Sai College for Women, Bhopal after my approval.

Date: 20/4/22

Place: Bhopal

Supervisor:

Dr. Sunita Yadav

Department of Zoology



ACKNOWLEDGEMENT

I wish to Express my sincere gratitude to the Principal Ma'am "Dr. Asha Agarwal" for providing me this opportunity to do my internship. I would also like to express my special thanks of gratitude to my teacher "Dr. Sunita Yadav" Ma'am for her valuable guidance and support in completing my internship.

I would also like to express my special thanks to Dr. Manoj Kumar Sharma, Scientist-in-charge and "Mrs. Binish rafat Ma'am, RMNH Bhopal.

I would also like to express my gratitude towards, HOD of Biotechnology and zoology, Dr. Rupa Guha Nandi Ma'am.

I would also like to thanks "Dr. Renu Srivastav" Ma'am, lab assistant "Mrs. Neelu Shrivastava" Ma'am for providing me with all the facilities that was required.

I also thanks Mrs. Sunita aunty for her help in providing us with the materials we required in the internship as well as I am very thankful to my family and friends for supporting me in my internship.

Date: 20/4/23

Place: Bhopal

Poornima Singh

Bsc I year

प्रतिपत्ति प्रपत्र * (Feedback Form)

(परियोजना कार्य / प्रशिक्षण/ शिक्षण/ सामुदायिक जुड़ाव)

*सम्बंधित बाह्य संस्था (यदि कोई हो) के संस्था प्रमुख/ अधिकृत अधिकारी/ मार्गदर्शक द्वारा भरा जाए

प्रशिक्षु/विद्यार्थी का नाम : पूर्णिमा सिंह

महाविद्यालय का नाम : श्री सत्य साई महिला महाविद्यालय, भोपाल

कक्षा: बी.एससी-प्रथम वर्ष

सेक्शन एवं अनुक्रमांक :

स.क्र.	मूल्यांकन आधार	प्रदत्त मूल्यांकन श्रेणी (A/B/C)#	टिप्पणी
1.	विद्यार्थी की नियमित उपस्थिति	}	B
2.	विद्यार्थी द्वारा प्राप्त सैद्धान्तिक ज्ञान		
3.	कार्यावधि में विद्यार्थी द्वारा अजित कौशल, व्यावहारिक ज्ञान		
4.	कार्य के प्रति विद्यार्थी की रुचि, गंभीरता		
5.	कार्यावधि में विद्यार्थी का सीखने के प्रति रवैया (attitude) एवं व्यवहार		
6.	सहकर्मियों, अन्य सदस्यों से सामंजस्य, समूह में कार्य करने की क्षमता		
7.	विद्यार्थी की समग्र (Overall) श्रेणी		

श्रेणी : A->उत्कृष्ट, B->अच्छा, C->सामान्य

दिनांक : 05/04/2022

स्थान : Bhopal

अधिकृत व्यक्ति के

हस्ताक्षर

नाम : Dr. Manoj K. Sharma

पदमुद्रा (सील)

डा. मनोज कुमार शर्मा / Dr. Manoj Kumar Sharma
 वैज्ञानिक-डी एवं कार्यालयप्रमुख / Scientist-D & Head of Office
 क्षेत्रीय प्राकृतिक विज्ञान संग्रहालय, भोपाल
 REGIONAL MUSEUM OF NATURAL HISTORY, BHOPAL
 (पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
 (Ministry of Environment, Forest & Climate Change, Govt of India)



Established in
1974

ॐ श्री साईं राम

OM SRI SAI RAM

श्री सत्य साई महिला महाविद्यालय
SRI SATHYA SAI COLLEGE FOR WOMEN

(Autonomous College)

Kasturba Hospital Road, Habibganj, Bhopal - 462 024 (M.P.)

E-mail : ssswcbhopal@yahoo.co.in, Website : www.srisatyaaisai.edu.in

Phone : 0755-2451119, 2456308

NAAC

Re-Accredited



NO.: SSSC/A/2/A/185

DATE : 23/4/2022

CERTIFICATE

This is to certify that **MS. POORNIMA SINGH** student of B.Sc. I year from Sri Sathya Sai College for Women, Bhopal has completed the field project on the topic entitled "**Museum Keeping Techniques**". This work was carried out from 30 December 2021 to 30 March 2022 from SSSCW, Bhopal and **Regional Museum of Natural History, Bhopal (24 March 2022 to 30 March 2022)**.

MS. POORNIMA SINGH is hard working, dedicated and result oriented. She has done excellent work in institute during project period. We wish her for bright future.

Place- Bhopal

Date- 23/4/22


Institute Seal


23/4/22

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- General Preservation methods
- Preservation of animals
- Preservation of Skeleton
- Taxidermy
- Skinning
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CHAPTER 1

Introduction

Museum - "A museum is a non-profit permanent institution in the service of society and its development open to the public which acquires, researches, communicates and exhibits the tangible and intangible heritage of mankind and environment for the purposes of education."

Museum is an institution dedicated to preserving and interpreting the human tangible evidence of humankind and the environment. In all functioning of this human evidence, the museum differs markedly from the library which it has often been compared. For the items housed in a museum are mostly unique and constitute the raw material of study and research. In many cases they are removed in time, place, and circumstance from their original context, and they communicate indirectly to the viewer in a way not possible through other media.

Museums have been founded for a variety of purposes: to serve as recreational facilities, scholarly centers, or educational resources; to contribute to the equality of life of the areas where they are situated; to attract tourists to a region; to promote civic pride or nationalistic endeavours; or even to transmit certain ideological concepts.

History

As institutions that preserve and interpret the material evidence of humankind human activity, and the natural world, museums have a long and varied history. Springing from what may be an innate human desire to collect and interpret and having discernible origins in large collections built up by individuals and groups before modern era.

The word museum has classical origin. In its Greek form, *Museum*, it meant "seat of the Muses" and designated a philosophical institution or a place of contemplation. Use of the Latin derivation, *Museum*, appears to have been restricted in Roman times mainly to places of philosophical discussion.

Thus, the great Museum at Alexandria, founded by Ptolemy I, soon early in the 3rd century BC, with its college of scholars, was its famous library, was more a prototype university than an institution to preserve and interpret material aspects of one's heritage. The word museum was coined in 5th century Europe to describe the collection of Lorenzo de' Medici in Florence, but the term conveyed the concept of conspicuousness rather than denoting a building. By the 17th century, museum was being used in Europe to describe collections of curiosities. Ole Worm's collection in Copenhagen was so called in England visitors to John Tradescant's collection in Lambeth called the way there a museum; the catalog of this collection, published in 1656, was titled *Musaeum Tradescantianum*. In 1675 the collection, having become the property of Elias Ashmole, was transferred to the University of Oxford. A building was constructed to receive it and this soon after being opened to the public in 1683, became known as the Ashmolean Museum.

Although there is some ambivalence in the use of museum in the legislation, drafted in 1753, founding the British Museum, nevertheless the idea of an institution called a museum and established to preserve and display a collection to the public was well established in the 18th century. Indeed, Denis Diderot outlined a detailed scheme for a national museum for France in the ninth volume of *Encyclopedia* published in 1765.

Use of the word museum during the 19th and most of the 20th century denoted a building housing cultural material to which the public had access. Later, as museums continued to respond to the societies that created them, the emphasis on the building itself became less dominant. Open air museums, comprising a series of buildings, preserved as objects and ecomuseums, involving the interpretation of all aspects of an outdoor environment, provide examples of this.

In addition, so-called virtual museums exist in electronic form on the Internet. Although virtual museums provide interesting opportunities for and bring certain benefits to existing museums, they remain dependent upon the collection, preservation, and interpretation of material things by the real museum.

Different types of Museum

- (i) **Archaeology Museum:** They display archaeological artifacts. They can be open air museums or they can exhibit items in a building.
- (ii) **Art Museum:** Also known as Art galleries. They are spaces for showing art objects, most commonly visual art objects as painting, sculpture, photography, illustrations, drawings, Ceramics or metalwork. First publicly owned art museum in Europe was Amerbach cabinet in Basel.
- (iii) **Encyclopedic Museum:** They are usually large institutions and they offer visitors a wide variety of information on many themes, both local and global. They are not thematically defined nor specialized.
- (iv) **History Museum:** They collect objects and artifacts that tell a chronological story about particular locality. Objects that are collected could be documents, artifacts, archaeological findings and other. They could be in a building, historic house or a historic site.
- (v) **Living history Museum:** Type of a museum in which historic events are performed by actors to immerse a viewer and show how certain events looked like or how some crafts were performed because there is no other way to see them now because they are obsolete.
- (vi) **Maritime Museum:** - Specialized museum for displaying maritime history, culture or archaeology. Primarily archaeological maritime museum exhibits artifacts and preserved shipwrecks recovered from bodies of water. Maritime history

Museums, shows and educate the public about humanity's maritime past.

vii) Military and War Museum: Museum specialized in military histories. Usually organized from a point of view of a one nation and conflicts in which that country has taken part. They collect and present weapons, uniforms, decorations, war technology and other objects.

viii) Natural history Museums: Usually display objects from nature like stuffed animals or preserved plants. They educate about natural history, dinosaurs, zoology, oceanography, anthropology, evolution, environmental issues and more.

Importance of Museum

Museums play a crucial role in preserving local culture. With careful documentation and artifacts preservation, a culture can be recorded and remembered regardless of its future. It can also be shared and understood by those from different cultural backgrounds.

- Spark Curiosity
- Get access to a trusted source of knowledge
- Develop civic awareness and a sense of place
- Help to know about historical

SCOPE OF MUSEUM

A scope is a stand alone planning document of a museum that succinctly defines the purpose of its collection holdings at the present and for the future. It derives from the mission of respective museum, as well as laws and regulations mandating the preservation of collections. A museum

must have a Scope of Collection Statement. It guides a museum in the acquisition and management of those objects that contribute directly to the museum's mission, as well as those additional collections that the museum service is legally mandated to preserve. It is the critical basis for managing museum collections. Scope is referenced in museum management planning, resource planning, long-range interpretive plan, and other planning documents that may affect the collection of museum objects or their use.

Functions of Museum

Museum is the public service organisation and deals mainly with objects - its exhibition and visitors. It has some responsibility towards the objects and society and thus, performs manifold activities on regular basis. Image and popularity of a museum depends upon its public friendly approaches, entertainment and amusement facilities in addition to its contribution towards research and education.

- i. Collection
- ii. Storage
- iii. Preservation and Conservation
- iv. Documentation
- v. Research
- vi. Exhibition
- vii. Security
- viii. Publication

➤ Literature Review of Museum

I

- Research Paper Name: A review of Research and literature on museums and lib. libraries
- Date: September 2011
- Author: Rachel Smithies, Act's Council - England

II

- Name of Research Paper: A Review of museum literature and a personal critique museology: The evolution of a socially conscious institution
- Date: September 2011
- By - McKenna N. Friend

► Detail of the concerned site / Institution

I visited RMNH along with my classmates for Internship.
RMNH - Regional Museum of Natural History, Bhopal M.P

Regional Museum of Natural History is a subordinate office of the ministry of environment, forest and climate change, Government of India. Former Prime Minister Shrimati Indira Gandhi who initiated a new project in 1976 on the occasion of 25th Anniversary of Indian Independence and decided that the country needs a national museum of natural history to depict its flora, fauna and mineral wealth to promote environmental awareness among the masses.

The Regional Museum of Natural History, Bhopal is a branch of the National Museum of Natural History, New Delhi located in the Environment Complex on Shahpura Lake in Bhopal. The museum was inaugurated on 23 September 1997, by Minister of Environment and forest of India, Sajjuddin Loq. The program was chaired by then chief minister of Madhya Pradesh, Digvijaya Singh.

The museum's collection tells the story of the interactions between humans and the natural world, specifically in Central India, and its galleries are accompanied by transcripts, translations and audio tapes and include a replica of a Rajasaurus skull. The museum offers a unique opportunity to understand the biodiversity of Central India and the complex natural make-up surrounding it. In the galleries located in the museum, the exhibition has been displayed in collaboration



Building of RMNH



With transcripts. Translate and visual audio DVDs and Phenomena are presented in the under selected subjects. It also has a biology, computer and a research room meant for children to acquire knowledge in a fun way. A temporary exhibition site is also made in premises which exhibit dugout displays on various subjects from time to time. The museum is open daily from 10 am - 6 pm upon entry to the museum the exhibition of the family of Dinosaur called Triceratops is visible.

Purpose of Museum

- To develop the exhibits with the flora, fauna and geological information of Central India
- To explain the importance of plants, animals and human interaction and their protection through performance and educational activities
- Organizing special educational activities for the disabled
- To promote environmental education, organise teaching programs in collaboration with various institutions working in Central India
- Conducting statewide academic activities to broaden environmental education.

Displayed galleries

(i) Biodiversity This gallery offers the opportunity to understand the basic concept of types of forests and biological segments of plant and organisms. In this gallery, there are demonstrations for understanding the importance of natural conservation and promoting the intelligent full use of natural resources.

(ii) Biomes The seven natural habitats displaying biodiversity of various natural habitats are displayed here which are also called biomes. Biodiversity is being shown in various natural habitats in the Central India region. Here are the major ecological regions of the world such as Ocean, grass arena, deciduous forest, desert, tropical rain forest, coniferous forest and Polar Plate countries are explained shown.

have adaptation kusti specific housing of flora and fauna
distended found in natural voice.

iii) Geographical Information of Central India animals and
flora. The creatures like the eagle, Vulture and the wooden
wolf who are dependent on the service of the news services
are called dead beasts. The last stage of the flow of energy
in any ecosystem is the decomposition of the body and the
organism of the body. The bacteria and fungal circles divide
the organic matter into it (one by nature to return

- (iv) Biogeochemical cycle
- (v) Evolution of organisms
- (vi) Search Center
- (vii) Biological computer room
- (viii) Temporary exhibition
- (ix) library
- (x) Eco theater





CHAPTER 2

COLLECTION OF ANIMALS

Different animals are collected in different ways depending upon their habit and habitat. The important methods of collection are described here.

- Catching by hand**: Some of small sized terrestrial or fresh water animals can directly be picked up by hands for which hand gloves can be used or and when necessary.
- Netting**: Most of the aquatic animals such as fishes, frogs, crustaceans aquatic insects etc and flying animals like insects are usually collected with the help of net. For this purpose nets of different mesh sizes are used. For the collection of insects hand net are commonly used.
- Digging and Draining**: This method is employed for the collection of burrowing animals. Many burrowing aquatic animals are collected by digging the sand from which they are filtered out.
- Trapping**: Some of the smaller animals like birds and rats and few small carnivorous animals are caught with the help of different types of traps. Different types of baits are arranged in such traps to lure the animals. Auditory for bait brings the animal to the trap where it gets trapped.
- Shooting**: Animals like birds, squirrels, snakes and large carnivorous mammals are hunted with the help of an air-gun or a small gun. Hunting by gun requires extraordinary precautions to be taken.

GENERAL PREPARATION METHODS

The larger specimens, such as *Rana*, *Pila* and cockroach are preserved in Preservations like formalin or alcohol for the study of their external features and they do not need any elaborate Process. But for the study of micro-organisms, smaller animals and histological study of tissues, an elaborate technique is employed for making their Permanent Preparations. These are smaller objects are mounted in balsam on a slide. There is a series of Processes by which a living organism or its tissue is made fit for microscopic examination in a Permanent State. The utility of Permanent Preparation is that the animal cell or tissue remains as such without undergoing major changes. The Permanent Preparation includes:

- (i) Killing and Narcotization
- (ii) Fixing
- (iii) Washing
- (iv) Staining
- (v) De-staining or removal of excess of stain
- (vi) Dehydration or removal of water
- (vii) Clearing or de-alcoholization
- (viii) Mounting on slide

(i) Killing and Narcotization

The first step in Permanent Preparation is killing instantly in order to prevent the change in the form of the object as it had in living condition and immediately fixing the object.

Sometimes killing is preceded by narcotization. The narcotics used were chloroform, menthol, ether, alcohol, acetone, etc.

The Purpose of narcotization and killing is so important as to have the same form and chemically constructed tissues as organisms as it had during its lifetime. In certain cases for smaller animals, killing is cheating & done by the slide.

(II) Fixing

Fixing is done with various fixative agents for histological elements. Fixative is essential in every type of microscopic preparation either for sections or for whole mounts and also in larger specimens. The function of fixation is manifold.

(i) The tissues become hard and hardening resists further post-mortem changes.

(ii) Fixative agent coagulates and renders insoluble elements of tissues which are dissolved in further processing.

(iii) The fixative agent renders insoluble the various constituent elements of cells, alters their refractive indices and thus makes them optically differentiated under the microscope.

Because of Brownian motion there is no possibility of seeing the finest cellular structures in unfixed material but we must bear in mind that fixed details are the coagulated outfall of the living structures.

Various fixative agents generally used are absolute alcohol, 90% alcohol plus glycine, picric acid, chromic sublimite, formal, osmium tetroxide and nitric acid with or without water. Depending upon the material, chromic sublimite or alcohol (100% or 90%) is recommended for whole mounts, Carnoy's fluid for cytological studies and other fixatives for histochemical studies.

(III) Washing

Washing is essential as by this process the uncombined

and excess of fixative agent is removed. The presence of fixative agent in tissues or cells will inhibit good staining. The washing agent depends upon the type of fixative agent used. An alcoholic picric acid in water is removed by 70% alcohol. Formal and Lushine sublimate are washed with water while sublimate is washed in alcohol.

(iv) Staining

The tissue or cell components are stained in various dyes. The dye makes the tissue distinct in its histological sphere. The various dyes are Orange G, Bordeaux red, Sudan's Congo red, alizarine oxyquinoline, methylene blue, neutral red, borax carmine, haematoxyline, Picro-indigo carmine, eosin and Gower's carmine. Mainly two kinds of stains are used:

- i) Nuclear stain. Stain the nuclear parts of the cells, such as Delafield's or Ehrlich's haematoxylin
- ii) Cytoplasmic stain such as borax carmine, Picro-indigo carmine, Gower's carmine and eosin, etc. which stain cytoplasm.

For general staining borax carmine is used. Aqueous stains are prepared in water whereas alcoholic stains are prepared in alcohol. When a single stain is used the process is called as simple or single staining. In some cases two stains, i.e. nuclear and cytoplasmic are used and this is called as double staining. Generally single stain is used for whole mounts but for protozoans etc. both cytoplasmic and nuclear stain are used. For cytological and histochemical studies different stains used will be discussed in vertebrate practical book.

(V) Destaining

The removal of excess of staining is called as destaining or differentiation. De-staining agents are acid alcohol or acid water. The acid alcohol is used with alcoholic stains while acid water is used with aqueous stains.

(VI) Dehydration

This process is meant for removal of water from the tissues. The dehydration prevents putrefaction or decaying and maintains the same shape and size of tissues or cells. The moisture or water in tissues absorbs various forms of destructive nature so that the tissue may be destroyed, hence the necessity of dehydration. Dehydration is done by passing the mounting material through various grades of alcohol, such as 30, 50, 70, 90 and 100% alcohols. The tissues is soaked in gradually increasing strengths of alcohol. The lower grades of alcohol, such as 30, 50 and 70% alcohol are prepared either from 90% or absolute alcohol. The dehydration is carried out in corked or glass-stoppered tubes.

(VII) De-alcoholization or clearing

After dehydration, transparency in tissue is obtained by treating with a clearing agent, which removes alcohol and makes the tissue clear and transparent. The clearing agents are cedar wood oil, clove oil, xylol and benzol etc. Xylol is most commonly employed and it makes the tissue hard and brittle. Clove oil is a superior clearing agent specially in the whole mounts. It also possesses a higher index of refraction than balsam mounting media.

(VIII) Mounting

Mounting forms the end of permanent preparation. The choice of mounting media is not much but they should have

The same refractive index as that of the cleared tissue. The refractive index of such a stained, dehydrated and cleared tissue cells in $N=1.54$ Canada balsam or D.P.X. have almost the same refractive index. Mounting is very easy process.

The tissue is kept over glass slide in a drop of balsam and coverslip is lowered slightly. After mounting, the slide may be kept for drying in a hot chamber. The excess of balsam on slide, as generally happens with beginners, should be removed with cotton soaked with xylol or 90% alcohol. This should be done when the balsam has cleared for much better finishing the edge of lower glass may be sealed with a cement such as gold seal or a varnish. The air bubbles present in balsam under lower glass should be removed by gentle heating.

During all the chemical bathing of tissues, two changes of each reagent are necessary. The time of keeping tissue in various reagents may vary from 5-15 minutes.

PRESERVATION OF ANIMALS

Different types of preservatives are required for the preservation of different groups of animals and the process of preservation may also differ. The various methods of preservation of different animal phyla have been described below:

A) Protozoa

The members of Phylum Protozoa are mostly aquatic in their active and reproductive stages. Moreover, they are of minute size hence it is not possible to catch them by hands as such they have to be cultured prior to their preservation. Generally mixed protozoan culture lacks amoebae and even if they are present, their number is negligible and are found over some aquatic leaf or other objects. It is therefore necessary to culture amoeba separately.

- **Amoeba** - for culturing amoeba proteins about 100 cc of water is taken in a shallow container into which few ml. grains were are added after the rice grains are about

Water, the water is contaminated with water mold, Saprolegnia and few small protozoans are also liberated into the medium. After a few hours, amoeba are left into this culture medium reproduce quickly and abundantly which are fed upon by the amoebae which ultimately grow and become numerous within a short span of time.

For the culture of soil and fresh water amoebae, hay infusion method can be employed. In this method about 10-12 gm of hay is boiled in 100 cc of distilled water for about 10-20 minutes. The liquid is now decanted and few drops of Sodium hydroxide is added to make the liquid alkaline. After the liquid becomes cool, it is poured into small dishes and the amoeba to be cultured is inoculated into these dishes. After some time, numerous amoebae develop.

B) Sponges

For wet preservation, sponges are kept in 5% formalin solution in 70% alcohol. For dry preservation, sponges are dried carefully in open air and kept in an appropriate container.

C) Worms

(a) Parasitic flatworms and Roundworms:

The adults and larval stages of tapeworm (cestoda, Platyhelminthes) and flukes (Trematoda, Platyhelminthes) and the round worms are collected from appropriate places in the bodies of their hosts. The adult worms and their immature stages are kept in boiled normal saline to which has been added enough glucose to make a 0.2% solution of glucose. If this mixture is kept at 35-37°C and changed once everyday, the worms may remain alive for at least 2-3 days.

Preservation - It is more or less essential to kill worms prior to their preservation. For killing purpose, the worms are kept in water and heated slowly. The worms are preserved in 6-8% formalin solution. Killing of worms can also be done in alcohol after which they can be preserved in formalin.

PREPARATION OF SKELETON

The animal whose skeleton is to be prepared is first of all anaesthetized with any anaesthetic agent such as chloroform. Now a long incision is given on the ventral surface of the abdomen by a sharp knife. In case of birds, incision should be given just below the bulgy keel portion of the sternum. Through this slit, the entire viscera and other internal organs should be taken out. If possible, skin should also be removed. The animal is now kept in a jar or trough filled with dilute solution of potassium hydroxide (KOH) or sodium hydroxide (NaOH). After few days, when the flesh or muscles become soft enough, the animal is taken out and the flesh is removed carefully. The process should not be done hurriedly instead, care should be taken to leave the ligaments intact so that the bones remain fastened together. Now a thick wire is also inserted through the neural canal of vertebral column so that all the vertebrae may remain at their respective positions. Similarly, if desirable, thick wires are also inserted through limb bones. If still the muscles fibers are found attached over the bones, it is again kept in a dilute solution of potassium hydroxide for few hours after which the remaining muscle fibres can be removed with the help of a forceps or scalpel.

After skeleton becomes free of muscles, if the bones are found fatty or oily, then the skeleton should be kept in fat dissolving chemical fluids like benzene or carbon tetrachloride for few hours and then it should be washed in warm water.

For bleaching of bones, the skeleton should be kept in 10% solution of hydrogen peroxide or H_2O_2 for 2-3 days. Bleaching can also be done by keeping the bones in a solution prepared from baking soda and chloride of lime. To make



this solution 4 Pounds of baking Soda. is mixed in one gallon of water and the mixture is boiled and cooled. Then one pound of chloride of lime is added and the solution is kept in a covered container in a dark place. Skeleton is submerged into this fluid till bleaching of bones is completed.

Skeleton so prepared is mounted on a board.

TAXIDERMY

Taxidermy is the process of reproducing a life like three dimensional representation of an animal for permanent display. In this process either the actual skin including fur, feathers or scales of the specimen is preserved and mounted over an artificial armature or the specimen is reproduced completely with man-made materials.

The word taxidermy is derived from two Greek words, taxis meaning movement; and derma meaning skin. Thus the literal meaning of taxidermy is 'movement of skin' that is removal of natural skin from the animal and replacing the same over an artificial body.

The modern practice of taxidermy incorporates many crafts, such as carpentry, wood working, staining, molding and casting but it also requires great talent and skills like sculpturing, drawing and painting. Example can be taken of a modern deer head mount in which the only natural parts of the animal used are the antlers and the skin. All other organs and tissues are created with man made materials. The eyes are made from glass, the eyelids are sculptured from clay, the soft tissues of the nose and mouth are sculptured from epoxy or wax and the manikin which includes the venation of each muscle is made from polyurethane foam. Now a days some of the taxidermic mounts, for example of a saltwater fish, do not contain any. The method is fruitful in the sense that it is ideal for catch and release anglers, who can release their gamefish unharmed.

and can still have a life sized mount produced from a good coloured photograph and measurements.

In a broad sense, the taxidermy includes skinning, preserving, stuffing and mounting of vertebrate animals. The important ones are being described below:

SKINNING

One of the most important and desirable aspect of skinning is the fact that animal to be skinned should be in a good condition that is, it has not been damaged or down during trapping or shooting. If the animal is alive it should be anaesthetized first. Dead or anaesthetized animal is laid on its back and straight incision is given in the posterior half of the median ventral surface. Care should be taken not to cut anything other than the skin. This incision is extended upto the basal portion of the tail. Now edges of the incision are lifted up and the thin tissue connecting the skin to the muscles is carefully cut. The skin is fixed upto the basal portion of the legs. Borax powder is used freely between the skin and flesh to absorb blood if any and to prevent sticking. Dry corn meal can also be used in place of borax powder. After this the muscles at the hip region are cut and bones are separated at the joints. Later, the legs are pulled out through the opening in the skin by carefully removing the skin from leg muscles. Now leg muscles are removed from the leg bones. If the animal has much flesh under its paw, it becomes necessary to cut through the bottom of the foot for the removal of flesh. In the same manner, tail muscles are also removed. Thus the legs and tail are turned inside out.



After the hind portion of the animal is fixed, it becomes easier to pull the skin forward towards the shoulders. After the skin in the shoulder region is separated from muscles, front legs are also processed in the same way as the hind legs were processed. Now skin of the head region is detached from the skull. Ears are cut from the skull leaving them attached to the skin. In eye region unusual care must be taken in order to get the lids closed for the lips. The cartilage of the nose should be cut close to the bone and left attached to the skin. As the skin is completely fixed from the head it turns inside out. Now the skin should again be turned right side out and if any blood is found on the hairs it should be immediately washed off.

While skinning a bird, one should be careful that the skull should not be completely removed because the skull is attached with the beak. Thus when the skin has been brought forward from the skull to the base of the beak the eyes are removed from their sockets and the muscles are cut away from the jaws. Now brain is removed from the skull by the way of foramen magnum with the help of a forceps or a thick needle. Besides this it should also be carefully seen that during skinning feathers should not be broken and also they should also be carefully seen that during skinning feathers should not be broken and also they should remain free from any blood spot.

Preservation

For the preservation of skin, it is once again turned inside out and is cleaned so that remains of fat, muscles or any other tissue is scraped off from the surface carefully. Now

White arsenic mixed with powdered alum in equal proportion is dusted heavily over the inner surface of the moist skin. It may also be rubbed over the skin and after it gets dried, the excess powder is dusted off. If necessary, the same powder can be powdered over the skin after making it in solution form. It is useful in case the skin is dried.

The skull is to be returned to the skin so it must be detached and the tongue along with jaw muscles are cut off. The brain is washed thoroughly by inserting forceps or needle through the foramen magnum and is taken out in the form of pulp. The emptied skull is coated with a mixture of arsenic and alum powder before being kept in its original position in the skin.

Stuffing

First of all thin strips of cotton or cloth is wrapped around the leg bones until the legs assume the same thickness proportions as they had prior to the removal of muscles. If necessary, the cotton is tied around bones by means of thread. If cheek muscles were removed from the skull, they are to be replaced by cotton. Now a thick wire is taken over which cotton is wrapped and is inserted into tail. If necessary, this wire can also be extended upto the skull region. Similarly wire is inserted into fore neck and trunk is made which is tied and kept inside the skin. When the entire skin is stuffed the slit is saved.

Mounting

After the stuffing is completed, artificial eyes made up of glass are fitted into the sockets in place of original eyes. Now the specimen is mounted on a board. Wires inserted into legs are fitted in the holes drilled in the board.

CHAPTER 3

Conclusion

The scientific value of a museum specimen depends to a large extent on the information regarding its classification and to a lesser extent on such additional information as the habit and habitat of the specimen where the specimen was collected along with name of the collector. Thus a neatly written or typed label containing the aforesaid information should be pasted over the container.

The specimens of an insect collection is greatly influenced by the nature of the labels. Small, neat and properly oriented labels on a fairly stiff white paper, preferably not larger than $1\frac{1}{4}$ by $3\frac{1}{4}$ inches in size, adds much to the collection. They should contain such informations as the name of order and family to which they belong, scientific name, date and locality of its capture along with the name of its collector. They should be at uniform height on the pin, parallel to and underneath the insect about 5/8 inch above the point of the pin.

Both dry and wet specimens should be regularly inspected. A problem always encountered with specimens preserved in fluid is the evaporation of the fluid. If any shortage of the preservation medium is detected during inspection in any of the wet specimen it should immediately be added. To minimize the problem of evaporation one should use rubber corks instead of ordinary ones and it is often advisable to use oversized corks that do not extend very far into the bottle. Evaporation may also be retarded by covering the corks with some sort of sealing material such as,

Paraffin or petroleum jelly or by sealing the jar by rubber gasket

All dry specimens including the skeleton are subjected to attack by various domestic beetles, ants and other museum pests and if the collection is to last any length of time, certain precaution must be taken to protect them from these pests. Various materials can be used, but it volatilized more rapidly than naphthalene and hence should be renewed at more frequent intervals. If the collection has been found infested with pests, it should be fumigated with fumigating agents like carbon disulphide.

Dust is another problem for most of the museum keepers. Specimens can be saved from dust by keeping them in glass chambers. Moist dusting should be avoided which otherwise may cause breakage. A vacuum cleaner will do better.

A museum should also be provided with exhaust fans so that workers and users may be prevented from pungent fumes of various preservations and other chemical agents used.

Problems faced during Project work

- i) Problem in travelling; as I am new in Bhopal I face a problem in travelling
- ii) Long hours of continuously standing
- iii) Budgeting Problems
- iv) Poor Planning
- v) Lack of communication

Introduction and scope

"A museum is a non profit Permanent Institution in the Service of Society and its development open to the Public which acquires, researches, communicates and exhibits the tangible and intangible heritage of mankind and environment for the process purpose of edutainment".

Museum is an institution dedicated to preserving and interpreting the primary tangible evidences of humankind and the environment. In its preserving of this primary evidences, the museum differs markedly from the library with which it has often been compared for the items housed in a museum are mainly unique and constitute the raw material of study and research. In many cases they are removed in time, place, and circumstances from their original context, and they communicate directly to the viewer in a way not possible through other media.

Scope

A scope is a stand alone planning document of a museum that succinctly defines the purpose of its collection holdings at the present and for the future. It derives from the mission of respective museum, as well as laws and regulation mandating the preservation of collection. A museum must have a scope of collection. A museum must have a scope of collection statement. It guides a museum in the acquisition and management of those objects that contribute directly to the museum's mission.

as well as those additional collections that museum service is legally mandated to preserve. It is the critical basis for managing museum collections. Scope is referred in museums management planning, resource planning, long range interpretive plan and planning documents that may effect the collection of museum objects or their use.

Detail of concerned site

I visited RMNH along with my classmate for Internship RMNH (Regional Museum of Natural history)

RMNH is a subordinate office of the Ministry of environment forest and climate change, Government of India.

Regional Museum of Natural history, Bhopal is a branch of the National Museum of Natural history New Delhi located in the Environment Complex on Shahpura lake in Bhopal. The museum was Inaugurated on 29 September 1997, by Ministry of Environment and forest of India, Saifuddin Soz. The Program was chaired by then chief Minister of Madhya Pradesh, Digvijaya Singh

Division of work.

work was divided among the three student of one group

Purpose

- To know about the meaning of Museum
- To know the latest definition of Museum
- To understand various scopes of Museum
- To know about various functions & techniques of Museum

[Handwritten signature]

▶ Project
CHAPTER
India

Project Methodology

CHAPTER-1

- Introduction and history of Museum
- Different types of Museum
- Scope of Museum
- Function of Museum
- Literature review
- Detail of concerned site/Institution

CHAPTER-2

- Collection of animals
- General preparation methods
- Preservation of animals
- Preservation of Skeleton
- Taxidermy
- Skinning

CHAPTER-3

- Conclusion
- Problems faced

1) Detail of Information Collection

Model preparation

Model can be 2D or 3D.

Relief work: - term relief refers to a sculptural method in which the sculpted pieces are bonded to a solid background of the same material. To create a sculpture in relief is to give the impression that the sculpture material has been raised above the background plane.

When a relief is carved into a flat surface of stone (relief sculpture) or wood (relief carving) the field is actually lowered, leaving the uncarved areas seeming higher. The approach necessitates a lot of chiselling away of the background, which takes a long time. On the other hand, a relief saves forming the mass of a subject, and is less fragile and more securely fixed than a sculpture in the round, especially one of a standing figure where the ankles are a potential weak point, especially in stone.

Taxidermy:- the art of preparing, stuffing and mounting the skins of animals with lifelike effect.

Literature Review

- Research Paper name: A review of research and literature on museum and libraries

Date: September 2011

Author: Rachel Smithie, Arts, Council England

- Name of Research Paper: A review of museum literature and a personal critique museology: The evolution of a socially conscious institution

Date: September 2011

Author: M.C. Kenner N. Friend

Description of the work completed by student

- Collection of Euglena from college pond water containing decaying nitrogenous matter like urine and faeces of animals.
- For the preparation of culture, about one gram of dry chicken manure or sheep manure is boiled in 250 ml of water for 10-15 minutes. Then the mixture is cooled and kept open in an airy place so that it may get contaminated with bacteria coming along with dust.
- A couple of days later euglenae are inoculated into this culture medium. Within one week, euglenae divide and become abundant which results into greenish appearance of the culture. Other flagellates protozoans can also be cultured in same manner.
- For preservation :- Generally protozoans animalcules are preserved in 10% solution of formalin.

Method applied technique

For preservation of Annelida:

Segmented worms are collected from their respective habitat such as earthworms can be collected by digging soil, nereis by digging their burrows on the sea shore and leeches from freshwater ponds, pools, etc.

Preservation: All Annelida can be killed by anaesthetising in alcohol or by slowly heating in water. To preserve the worms in fully extended condition with their internal organs in perfect state, 6% formalin solution containing glycerine is injected into their body cavity by

means of a hypodermic syringe. Injection of the preservative into the body cavity after every 10-15 segments exerts sufficient pressure so that segments get fully extended. After this the worms are preserved in formalin solution.

Problems faced

- (i) Problem in traveling
- (ii) Poor planning
- (iii) Budgeting problems
- (iv) Long hours of continuous working
- (v) Lack of communication.

