



BIOARCHAEOLOGICAL STUDIES IN INDIA: AN ASSESSMENT OF PROGRESS AND PROSPECTS

Future of the Past

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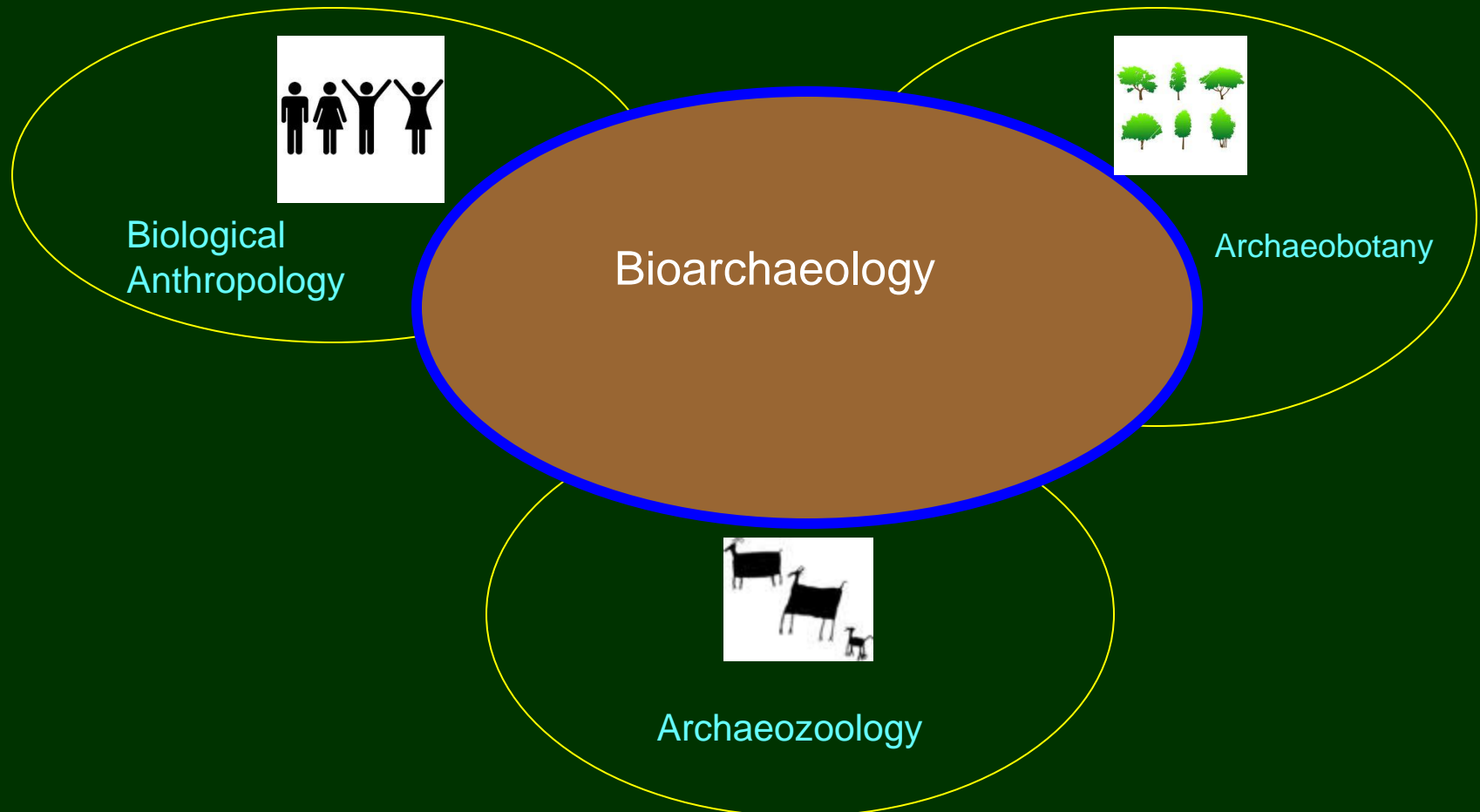
Schema of this presentation

1. What is the status of archaeo-faunal studies within the broader frame of archaeological investigations?
2. Which infrastructure is available and what is the condition of human resources?
3. What are the impacts of skewed Indian archaeo-faunal studies?
4. What are basic identification-related unresolved issues?
5. How to deal with taphonomy and site formation related interpretations?
6. How best biomolecular studies including aDNA and protein polymorphism can be applied to Indian archaeo-faunal enquiries?
7. How can inputs from other disciplines be used to look at humans and animals in the past?

This presentation aims to provide an introspective assessment of,
(a) what progress has been made in analytical methods,
(b) what are the methodological constraints, and
(c) to look for possible steps needed to take the discipline of Indian bioarchaeology forward.



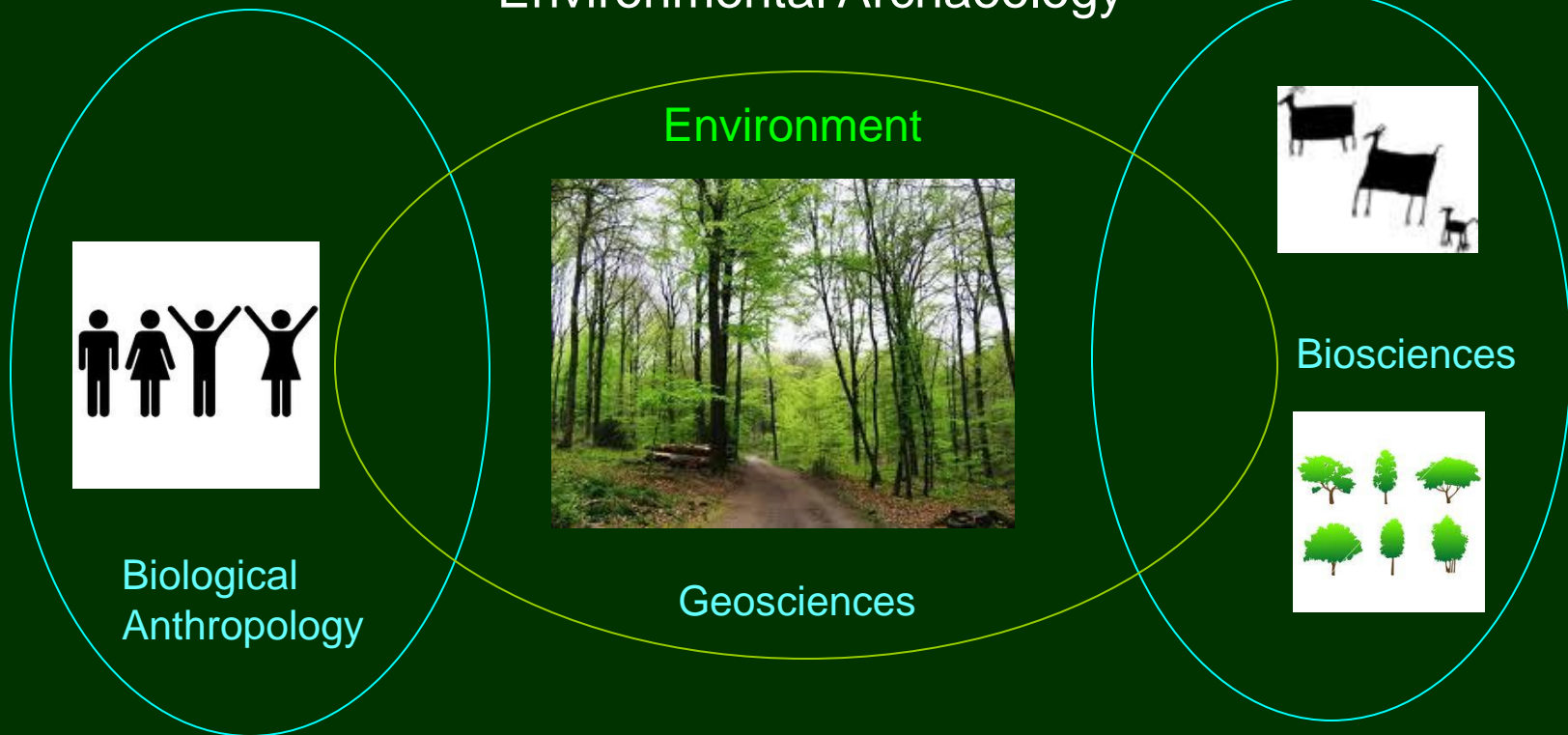
Study of past “Human-Plant-Animal” interactions





Study of past “Human-Environment- Plant-Animal” interactions

Environmental Archaeology





Archaeozoology/Zooarchaeology?

(Archaeo-faunal studies: :Study of animals in archaeological contexts)

Archaeozoology

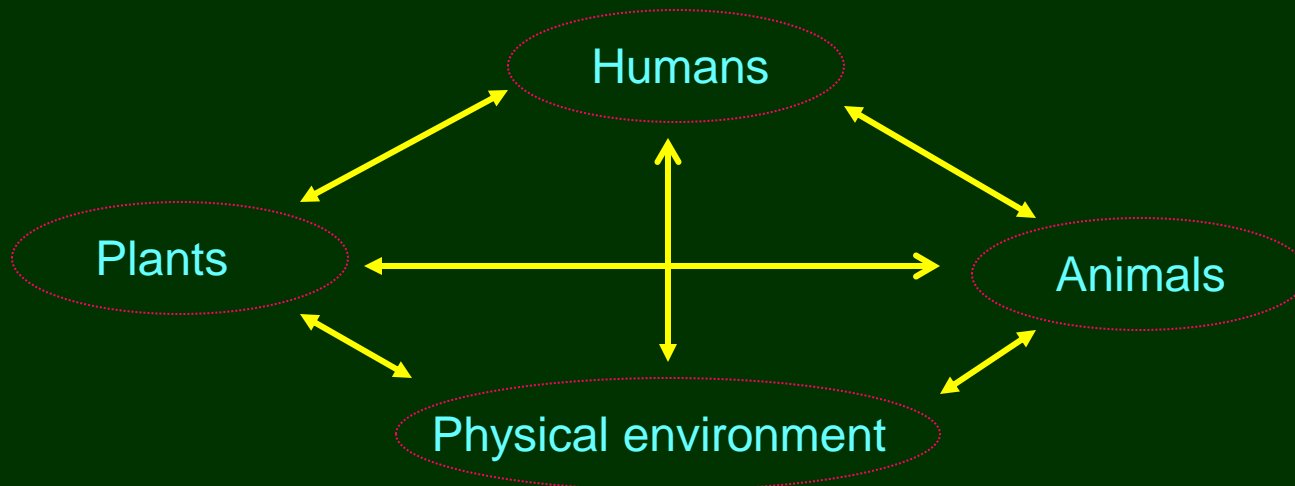
- More focus on zoological interpretations of animal remains
- European tradition

Zooarchaeology

- More focus on archaeological interpretations of animal remains
- American usage pattern

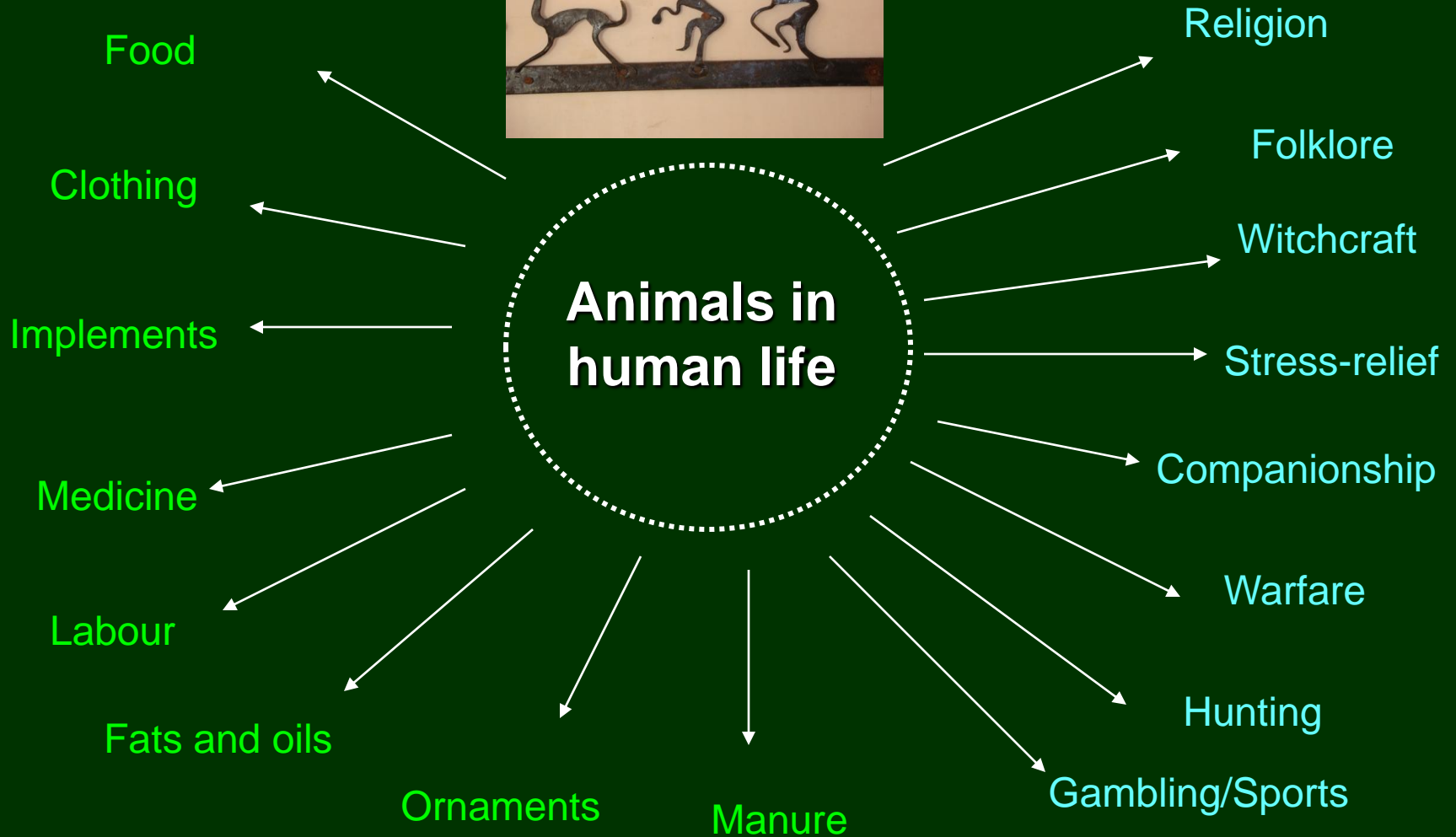
Primary goal

to shed light on the relationships between **humans and animals** and the consequences of these interactions for both humans and their environment.



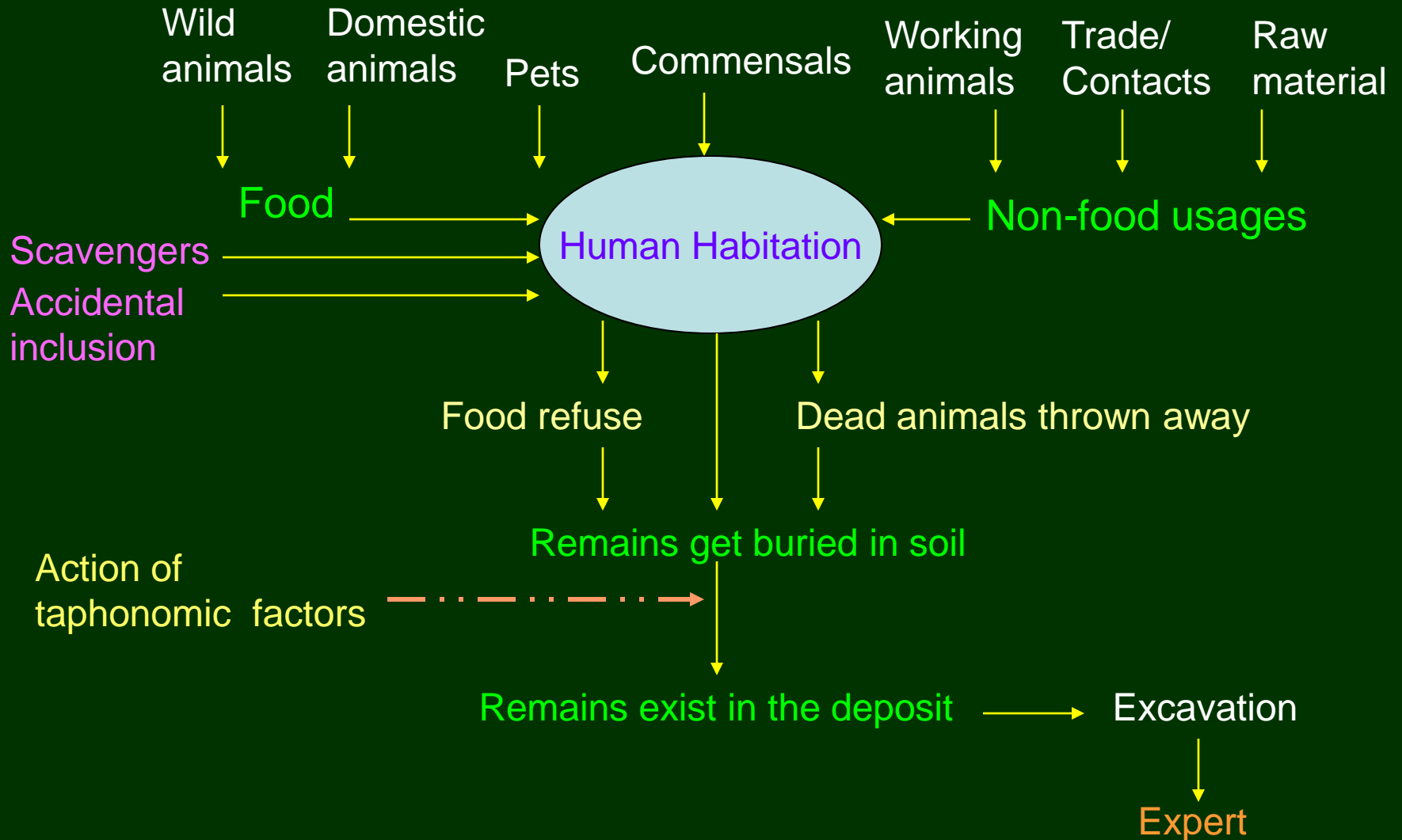


Wide Spectrum of Human-Animal Interactions





Why and how animal remains are found in archaeological contexts?





What information do archaeozoologists use?

Most archaeozoologists analyze the bones or other hard parts of animals recovered from archaeological sites. Archaeozoologists study all groups of animals, including mammals, birds, fish, reptiles, and amphibians, as well as molluscs and other invertebrates. Many archaeozoologists employ other sources of information in their studies, including historical documents, ethnographic studies, pictographic evidence, and palaeo-faecal remains, as well as the chemical composition, isotopic signatures, and genetic makeup of both human and non-human animal remains.

Variety of evidence

Direct evidence

Material remains

Primary



Indirect evidence

Visual evidence

Textual evidence

Oral evidence

Secondary: Only for corroboration



Information about Past Animals



Direct Sources

Macro-remains

Bones



Teeth



Antlers



Cartilage

Shells



Otoliths



Chitin

Egg shells



Stomach stones

Feathers or impressions

Bone, teeth, shell, antler objects



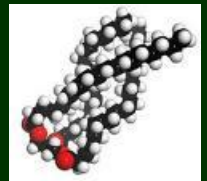
Micro-remains (biomolecules)

DNA



Proteins/
Amino acids

Lipids



Information about Past Animals

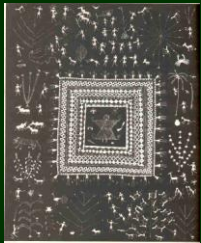
Indirect Sources



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Folk art



Icons



Figurines



Seals/Carvings
Engravings



Art objects



Foot prints



Coins

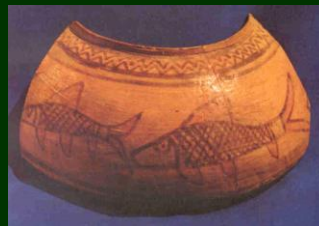


Literature

secular

religious

folk





Archaeo-faunal studies in India: Past Reviews

Thomas (1977): first thesis and a review of Indian faunal studies

Chattopadhyaya (1985): more emphasis on general methods

Sahu (1988): original thesis material of 1984, overview and compilation

Thomas and Joglekar (1994): site-wise and culture-wise discussion

Joglekar (1996): Specifically related to quantitative studies

Thomas (2000-2001): work done at the Deccan College laboratory

Joglekar (2000-2001): use of advanced statistical methods

Chattopadhyaya (2002): review of methods and other important issues

Joglekar (2007): methodological constraints, and future of studies

Joglekar (2007-08): review of faunal studies in the Ganga Valley

Joglekar and Goyal (2011*): review of the Harappan faunal studies



Archeozoology in Historical Perspective



The history of archaeozoological research goes back to about 150 years

STAGE A: the 19th century

Rutimeyer (1861) : *Die Fauna der Pfahlbauten der Schweiz*

First Archaeologist to recognize importance of faunal studies

Emphasis on :
(a) difference between domestic and wild animals
(b) history of domesticated animals
(c) methods of hunting in different cultural periods

Charles Darwin's *Variations of Plants and Animals Under Domestication* (1868)

Lydekker (1888): study of faunal material from Billa Surgam Caves, Andhra Pradesh (Upper Palaeolithic)

Main features of this stage

Mostly examined from geological contexts and “geoscience” approach dominated

Faunal collections were selective

Not much care to collect and preserve materials from stratified contexts

STAGE B: Early 20th century

Sewell and Guha (1931): Faunal study from Mohenjo-daro

Prashad (1934): Faunal study from Harappa

Main features of this stage: This was the beginning in Indian Subcontinent



Archeozoology in Historical Perspective

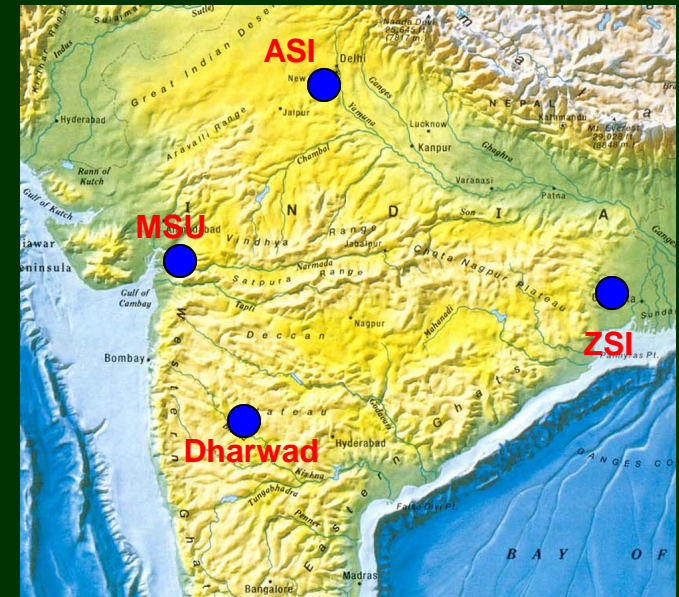


STAGE C: Mid-20th century (1950-1970)

Bhola Nath	Hastinapur (1954-55), Maski (1957), Sarnath (1958), Taxila (1959). Harappa (1962), Rangpur, (1962-63), Brahmagiri (1963), Nagda (1966) Prabhas Patan (1967), Rupar and Bara (1968), Alamgirpur (1969)
J.C. George	Nasik and Jorwe (1955)
J. Eapen	Nevasa (1960)
J. Clutton-Brock	Langhnaj (1965)
D.R. Shah	Chandoli (1965), Devnimori (1966), Nagara (1968), Kaundanyapur (1968)
V.V. Rao	Paunar (1968), Takalghat and Khapa (1970)
A.R. Alur	Sangankallu (1969)

Main features of this stage

- Mainly species lists given as per expected by archaeologists
- Faunal studied based on **selective** collections
- Not much focus on stratigraphic contexts
- Not much use of reference collections
- Zoologists not involved in archaeological work
- Beginning of recording measurements in Indian context



Places of faunal experts



Archeozoology in Historical Perspective



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STAGE D: Late 20th century (1970-1990)

A.R. Alur

D.R. Shah

Bhola Nath

V.V. Rao

A.T. Clason

G.L. Badam

P.K. Thomas

A.K. Sharma

U.C. Chattopadhyaya

Paul Rissman

Victoria Cane

T. Narasipur (1971), Teredal (1971), Kayatha (1975)

Pochampad (1979), Yelleswaram (1979)

Jokha (1971), Navdatoli (1971), Kodekal (1973), Dhatva (1975)

Tilura Kot and Kodan (1972)

Bhokardhan (1974), Mahurjhari (1977)

Inamgaon, Nevasa, Kodekal, Budihal, Mallur (1977)

Inamgaon (1977), Apegaon (1979), Naikund (1982)

Bagor, Tilwara, Khanpur, Prabhas Patan (1977)

Veerapuram (1984), Inamgaon (1988)

Surkotada (1979), Gufkral (1980-81)

Ganga Valley Sites (1988)

Oriyo Timbo (1985)

Rojdi (1989)

Main features of this stage

Input from veterinary biology

revealing of use-related pathologies (e.g. ankylosis)

More diversification of periods

Harappan to Early Historic Phases

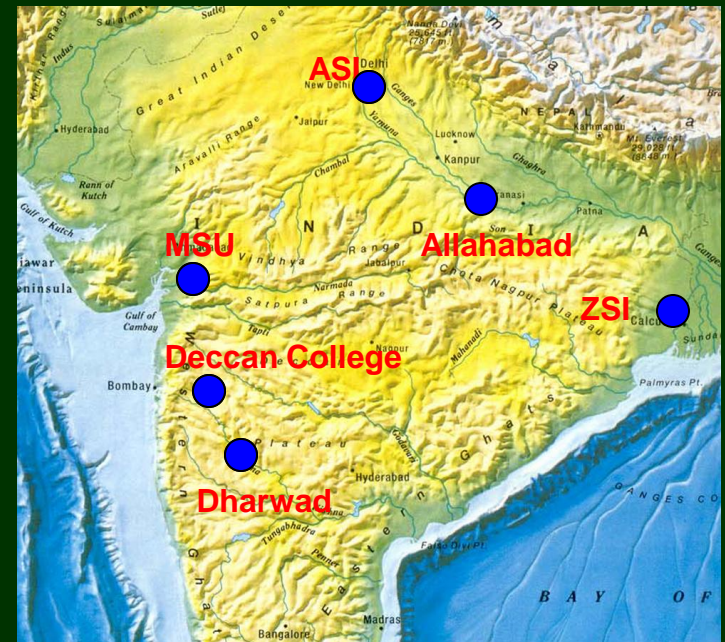
Establishment of Archeozoology Laboratory at DC

Beginning of reference collection

Systematic training

Standardization of analytical procedures

DCPARZ (Computerized analysis system)



Places of faunal experts



Archeozoology in Historical Perspective



STAGE E: Late 20th century (1990) onwards

V.N. Misra****

P.K. Thomas***

P.P. Joglekar**

Arati Deshpande-Mukherjee**

Seema Pawankar**

R.M.M. Chandraratne**

David Tetso*

Pankaj Goyal*

C.V. Sharada*

Gauri Bedekar*

G.S. Abhyan*

Main features of this stage

Other centres (than DC) dysfunctional

At Archeozoology Laboratory of the DC

Growth of comprehensive reference collection

Input from ethnoarchaeology,

statistics and mathematics

Diversification of periods and animal taxa studied

Experimental archaeozoology

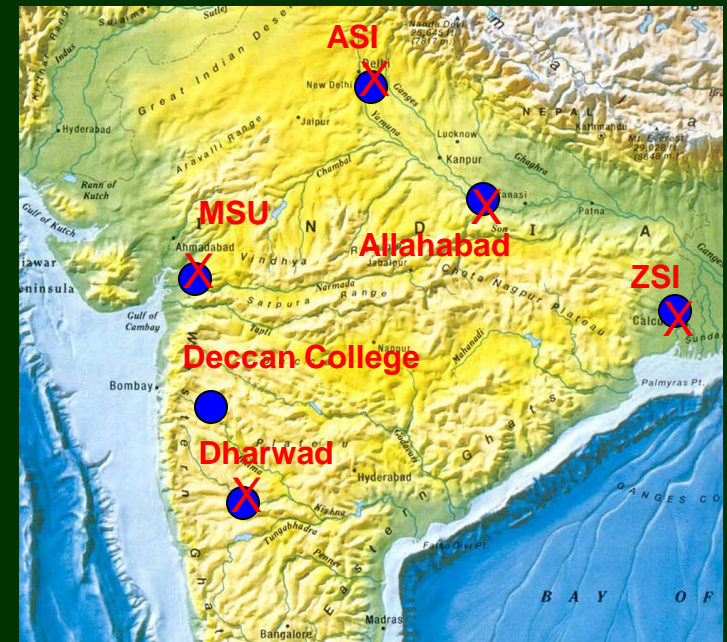
Training to archaeozoology students

Providing service to all India

Service to Sri Lanka, Turkmenistan, Mauritius

Beginning of ancient DNA studies

Staff and Students: Reports of 51 sites



Deccan College emerges and continues as the only centre for such work



Manpower: Past and present Contributors to Archaeo-faunal Studies



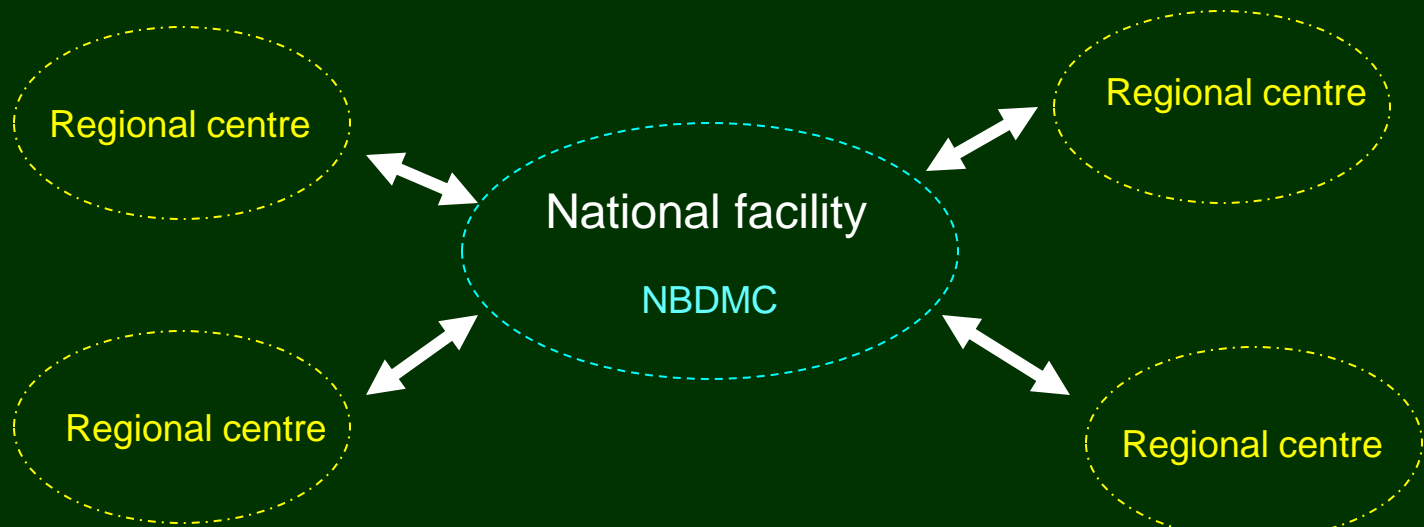
No. of Sites	Number of scholars	Names of the scholars Number in parentheses refers to no. of sites analysed
1	28	----
2	7	Allchin, B., Paddayya, K., Belcher, W.R., Sharma, A.K, Campagnoni, B., Patel A.
3 to 10	8	George, G.C. (4), Rao, V.V. (4), Badam, G.L. (4), Bhan, K.K. (4), Deshpande-Mukherjee, A. (5), Misra, V.N. (6), Meadow, R.H. (6), Chattopadhyaya, U.C. (6), Clason, A.T. (10)
11 to 20	3	Shah, D.R. (13), Alur, K.R. (15), Nath, B.(18)
21 and more	2	Thomas, P.K. (22), Joglekar, P.P. (46)

Name	Period	Ms	Neo	Chal	Harp	Ir/Hist	Med	Total
Misra, V.N.	1971-1988	2	0	4	0	0	0	6
Meadow, R.H.	1979+	0	1	5	0	0	0	6
Chattopadhyaya, U.C.	1991+	4	2	0	0	0	0	6
Clason, A.T.	1974-77	0	6	0	4	0	0	10
Shah, D.R.	1965-1980	3	1	0	4	4	0	12
Alur, K.R.	1969-1980	3	7	1	1	3	0	15
Nath, B.	1954-1971	1	6	6	0	5	0	18
Thomas, P.K. <i>et al.</i>	1975+	4	1	2	8	7	0	22
Joglekar, P.P. <i>et al.</i>	1991+	2	16	5	10	10	3	46



Action plan/ Vision Statement 2025

1. Strengthen existing laboratory at Deccan College (upgrade to a National Facility)
2. To revive the earlier University centres of study (e.g. MSU and Allahabad)
3. To create new centres/laboratory facilities (regional level)
4. To create a national bioarchaeology data management centre (NBDMC)
5. To co-ordinate research programme of all centres
6. To develop each centre/laboratory for a specialized task (e.g. fish, insects, mites, ancient DNA etc.)





Bioarchaeology: what next?



What is needed?

- (a) Identify the needs of the centres and acquire necessary equipment
- (b) Create training modules for professional archaeologists for research orientation
- (c) Develop expertise in sub-disciplines to study non-mammalian remains, especially microvertebrates
- (d) Continue to enhance reference collections
- (e) Develop expertise to study phytoliths, ostracods, parasites, fungal spores
- (f) Develop laboratory and personnel to study ancient DNA as well as mitochondrial DNA of contemporary animals and plants
- (g) Conduct actualistic/experimental studies for understanding role of site formation processes.
- (h) Create an archival facility of biological remains and generate a database
- (i) Identify future research areas and interact with archaeologists to achieve the goals



THANKS