SRI Y.N.COLLEGE (AUTONOMOUS) - NARSAPUR

(Affiliated to Adikavi Nannaya University)
Thrice Accredited by NAAC at 'A' Grade
Recognized by UGC as 'College with Potential for Excellence'

DEPARTMENT OF HISTORY AND TOURISM

INVITATION

President of the function

Dr.APV Appa Rao

Principal In - charge,

Sri YN College (A), Narsapur

Guest Lecture

On

ARCHAEOLOGY: THE SCIENCE OF RECONSTRUCTING THE PAST

By

Dr.K.P. Rao

Professor

Hyderabad Central University

Date & Time: **08-03-2022 at 10:00AM**

Venue: HRD CENTER

Sri Y.N College (A), Narsapur.

By

DEPARTMENT OF HISTORY AND TOURISM

STAFF & STUDENTS

Sri YN College (A), Narsapur

A

GUEST LECTURE

ON

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A Guest Lecture was Conducted by the Department of History and Tourism on **08-03-2022** **By** **Dr.KP Rao** Professor, Hyderabad Central University, on the Topic "**Archaeology: The Science of Reconstructing The Past "** In this Guest Lecture 8 Staff members and 45 Students Participated.

Brief Report:

SCIENCE AND HUMAN PAST

ARCHAEOLOGICAL SCIENCE IN RECONSTRUCTING THE HUMAN PAST

PRESENTATION

BY

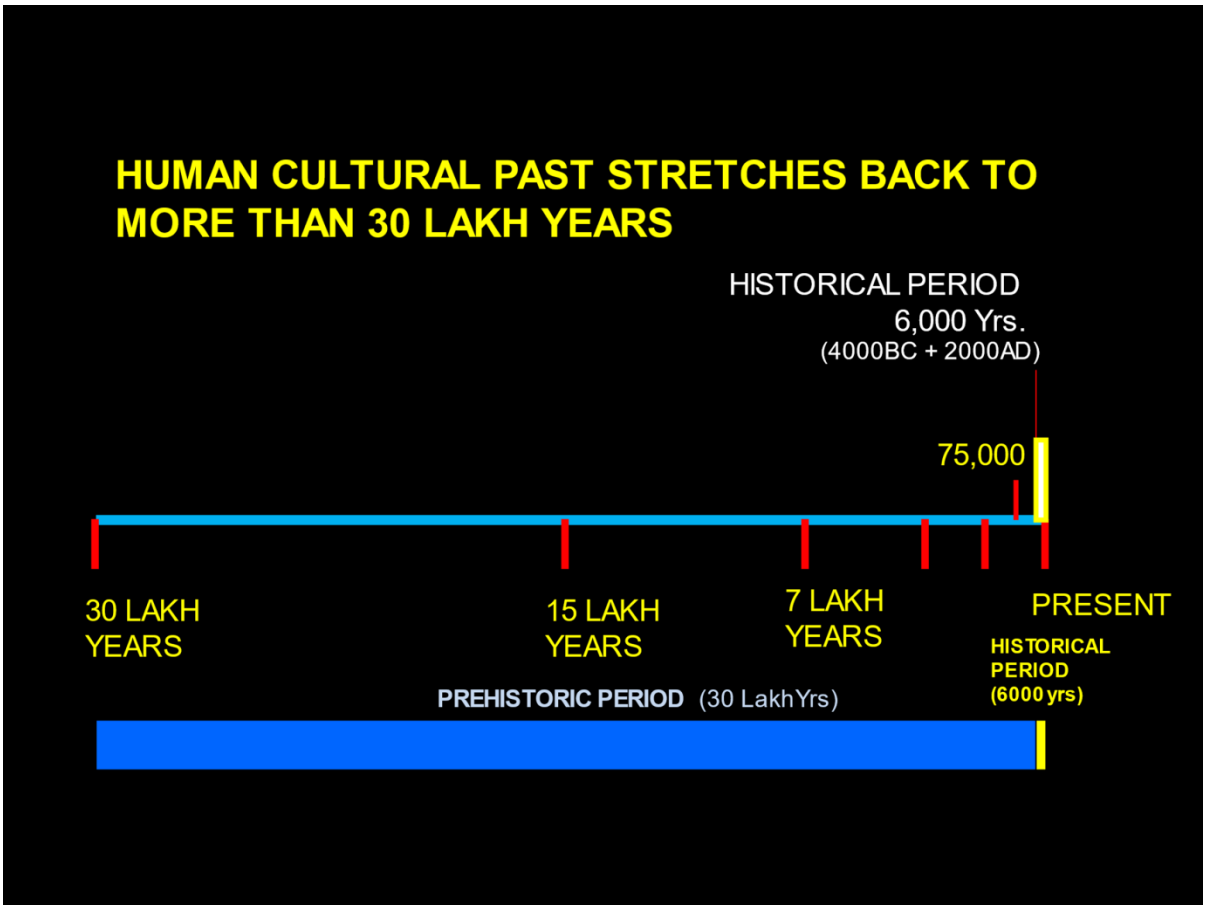
PROF. K.P.RAO

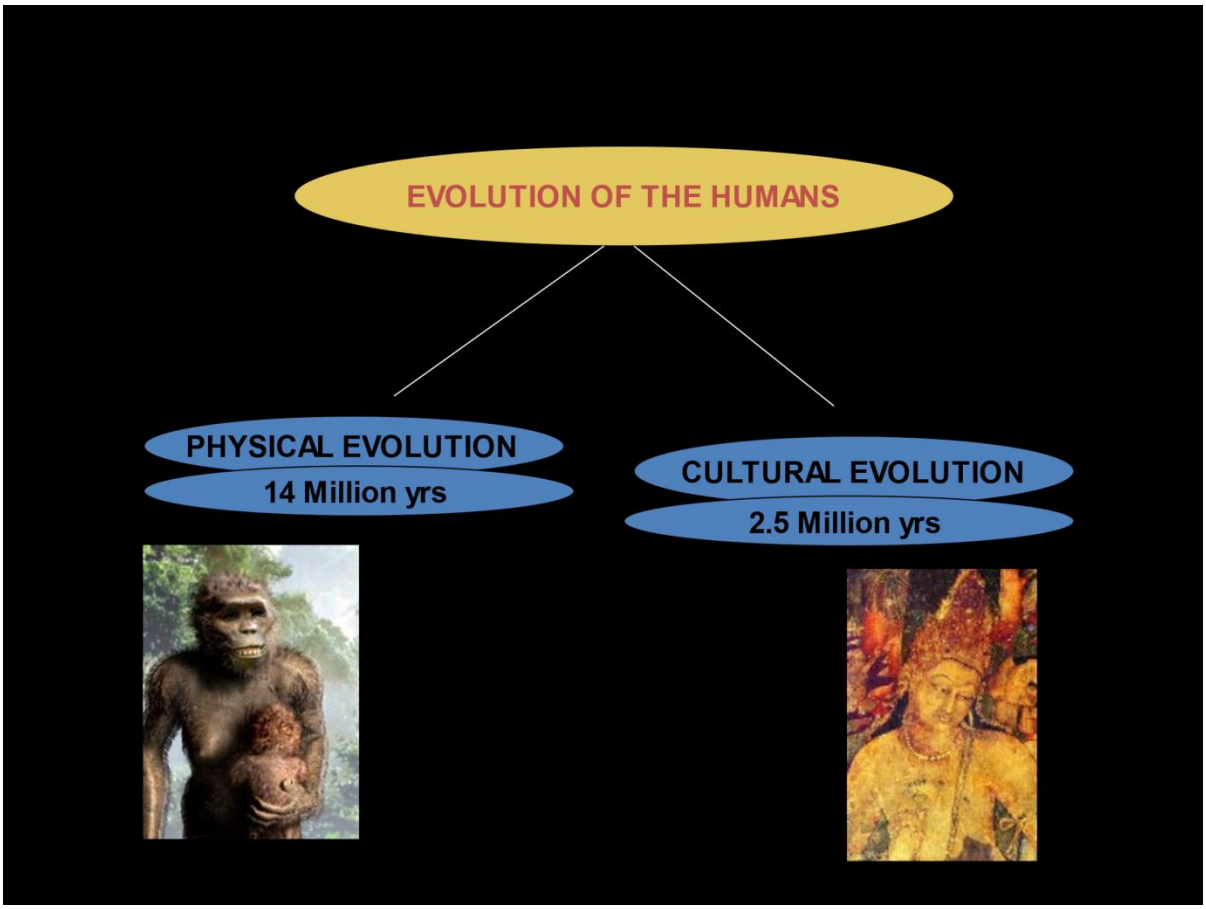
UNIVERSITY OF HYDERABAD

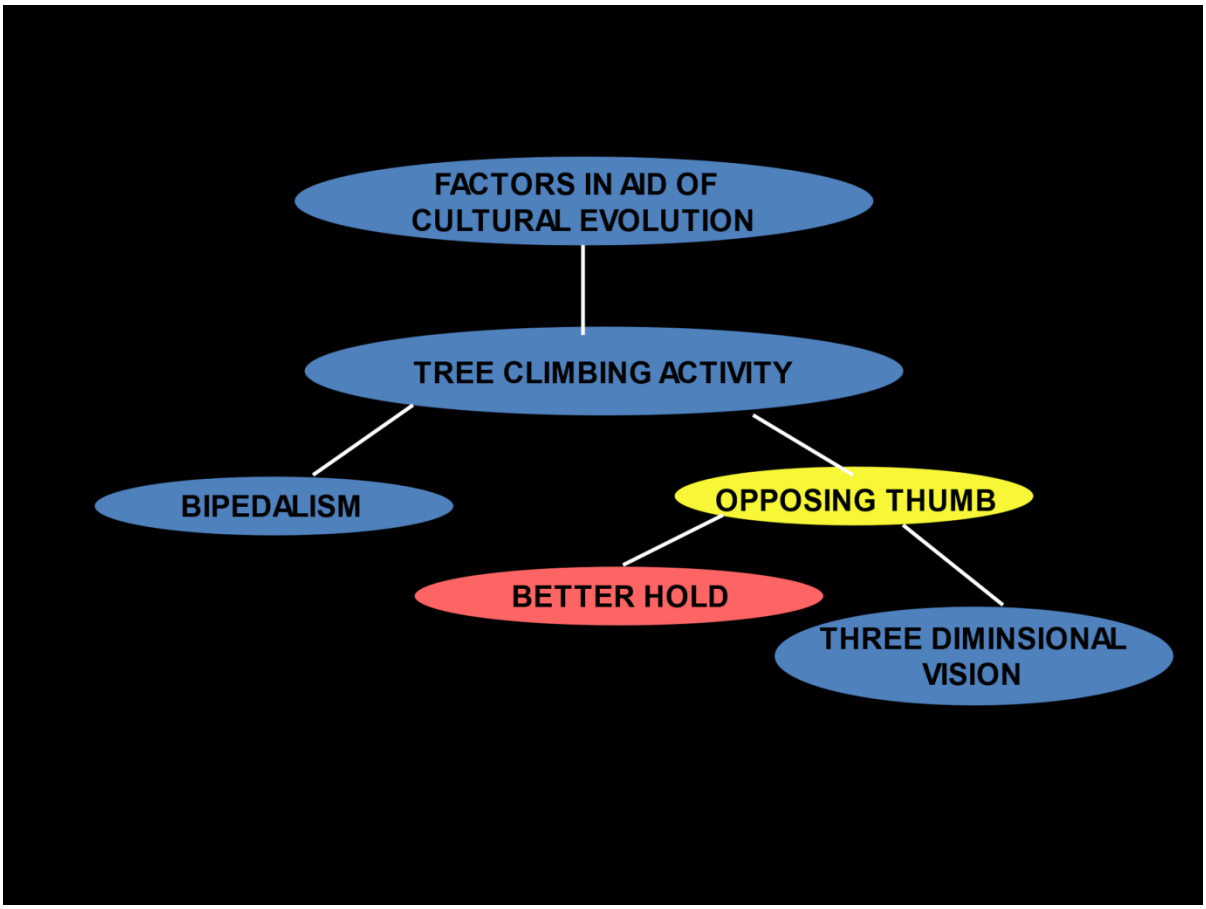
WHAT IS ARCHAEOLOGY?

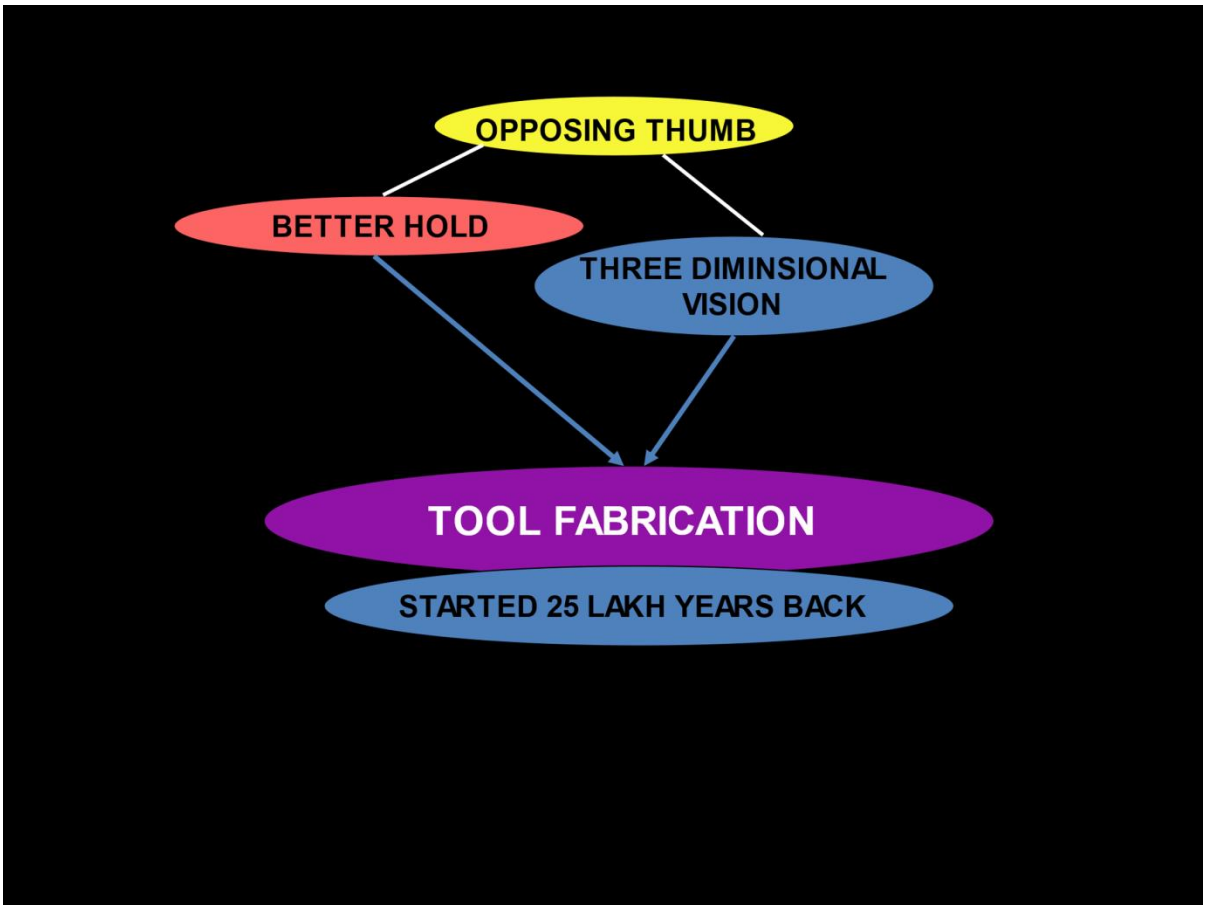
ARCHAEOLOGY IS A SCIENCE THAT RECONSTRUCTS THE HUMAN PAST BASED ON MATERIAL REMAINS

The word “Archaeology” is derived from Greek `archaios’ meaning “ancient” and `logos’ meaning “knowledge”


HUMAN CULTURAL PAST STRETCHES BACK TO MORE THAN 30 LAKH YEARS
HISTORICAL PERIOD
6,000 Yrs.
(4000BC + 2000AD)
75,000
30 LAKH YEARS
15 LAKH YEARS
7 LAKH YEARS
PRESENT
HISTORICAL PERIOD (6000 yrs)
PREHISTORIC PERIOD (30 LakhYrs)


EVOLUTION OF THE HUMANS
PHYSICAL EVOLUTION
14 Million yrs
CULTURAL EVOLUTION
2.5 Million yrs


FACTORS IN AID OF CULTURAL EVOLUTION
TREE CLIMBING ACTIVITY
BIPEDALISM
OPPOSING THUMB
BETTER HOLD
THREE DIMINSIONAL VISION


OPPOSING THUMB
BETTER HOLD
THREE DIMINSIONAL VISION
TOOL FABRICATION
STARTED 25 LAKH YEARS BACK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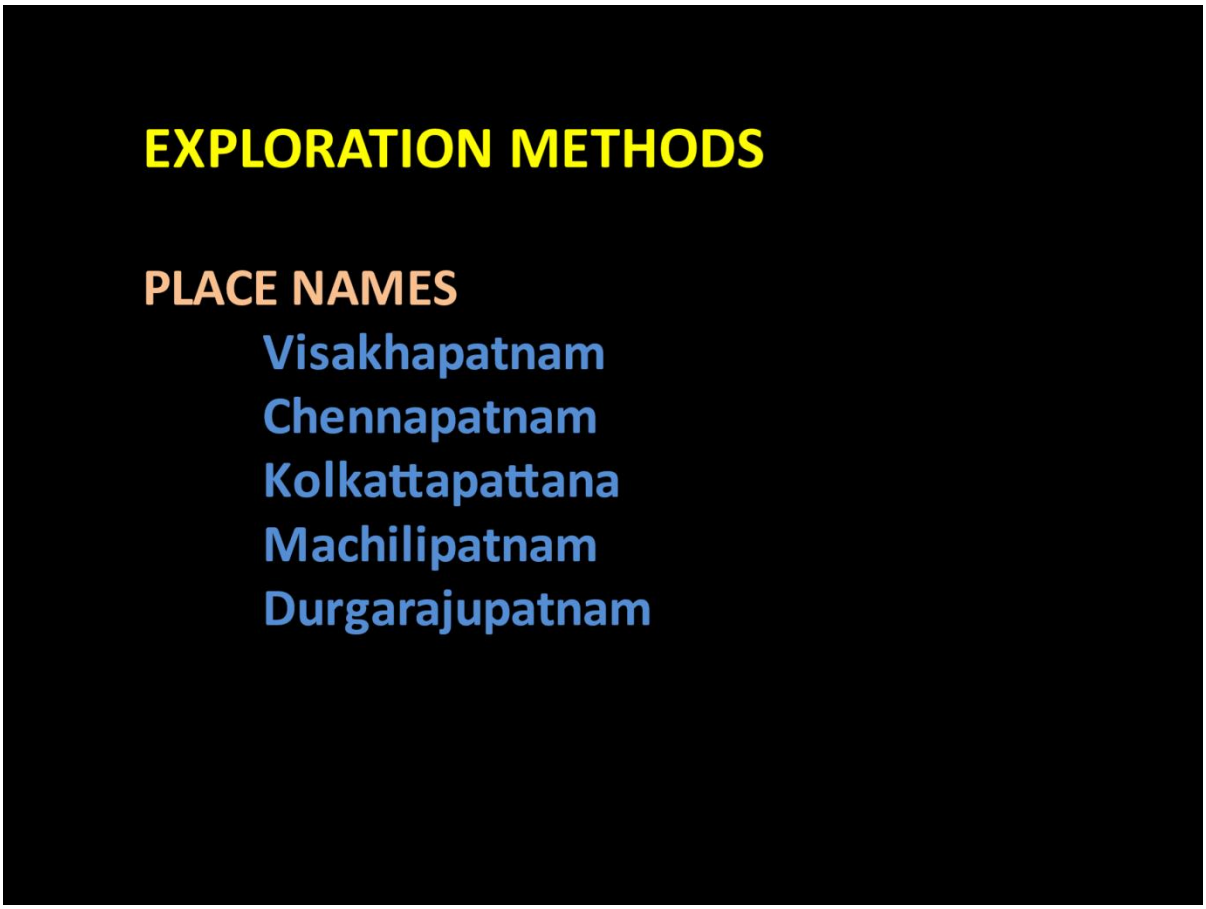
Why the global epidemic for Obesity, Diabetes mellitus and Cardiovascular Disease
hunter gatherer.....to fast food junkie

SOMETIMES THE ARCHAEOLOGICAL SITES LOOK VERY SIMPLE. THE ELEVATION OF THE ANCIENT HABITATION IS KNOWN AS ‘MOUND’.

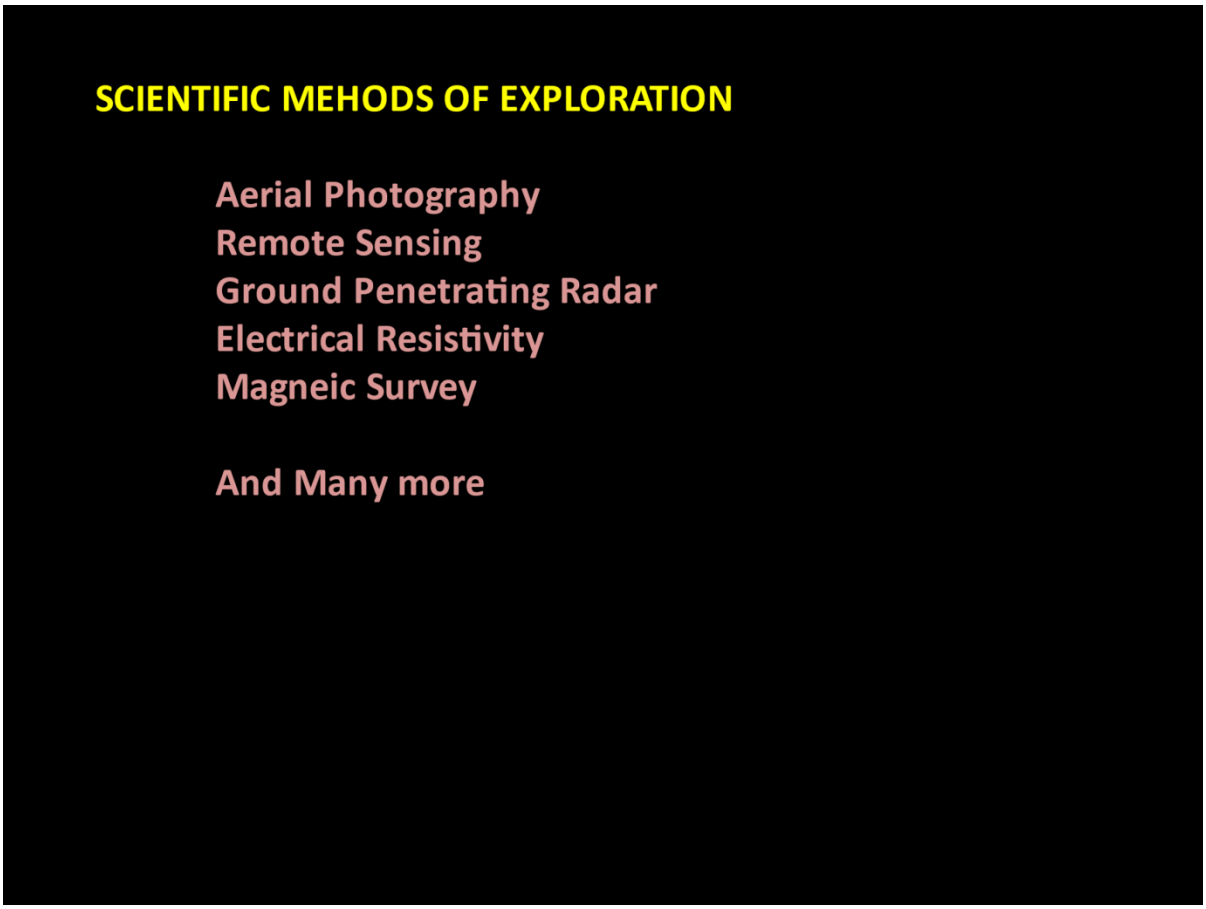
A MOUND CONTAINS MANY ANTIQUITIES. SOME OF THEM VERY SIMPLE LIKE THE PIECES OF POTTERY. STILL THEY ARE IMPORTANT AS THEY CAN TELL US THE ANTIQUITY OF THE SITE, THE TECHNOLOGY, THE TRADE RELATIONS, ETC.

HOW DOES ARCHAEOLOGISTS DO?

- EXPLORATIONS
- EXCAVATIONS
- ANALYSIS AND DATING
- REPORTING
- CONSERVATION

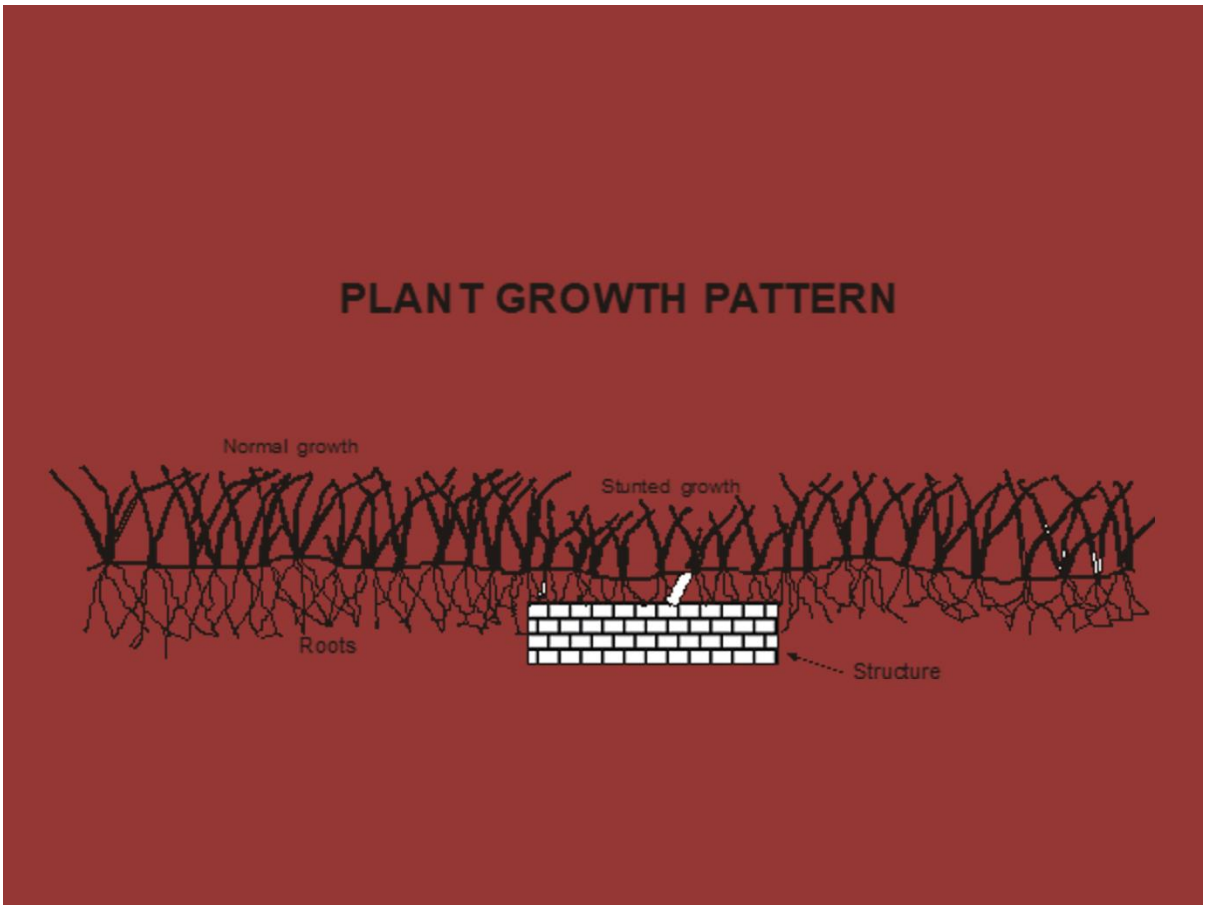


SOMETIMES VERY SIMPLE METHODS LIKE THE NAME OF THE PLACES ARE USED TO DETECT ANCIENT SITES, LIKE IN THIS EXAMPLE, THE PLACES WITH MARITIME CONTACTS.



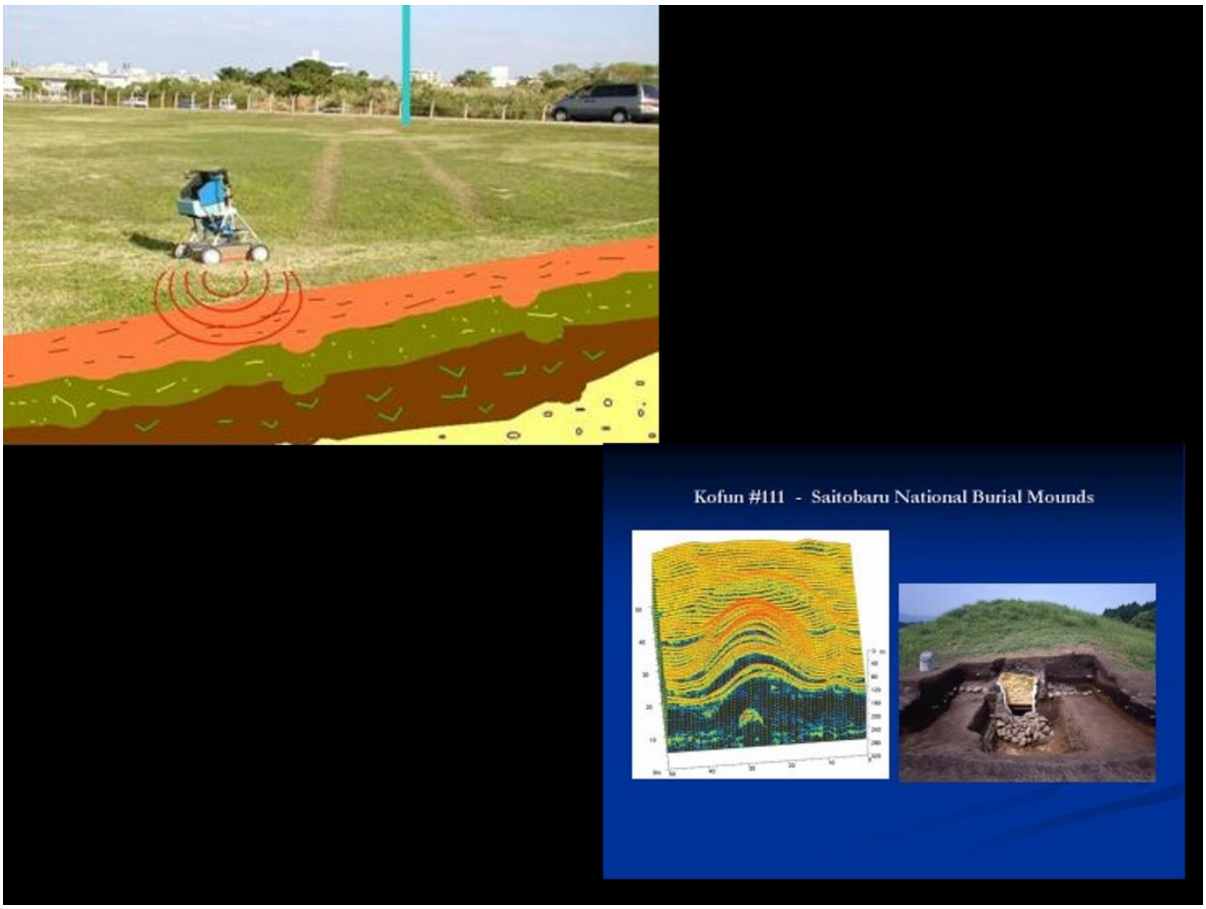
APART FROM THE SIMPLE METHODS, WE ALSO USE HIGHLY SCIENTIFIC METHODS LIKE THE METHODS MENTIONED ABOVE.

PHOTOS TAKEN FROM THE AEROPLANES CAN REVEAL US THE BURIED ANCIENT STRUCTURES

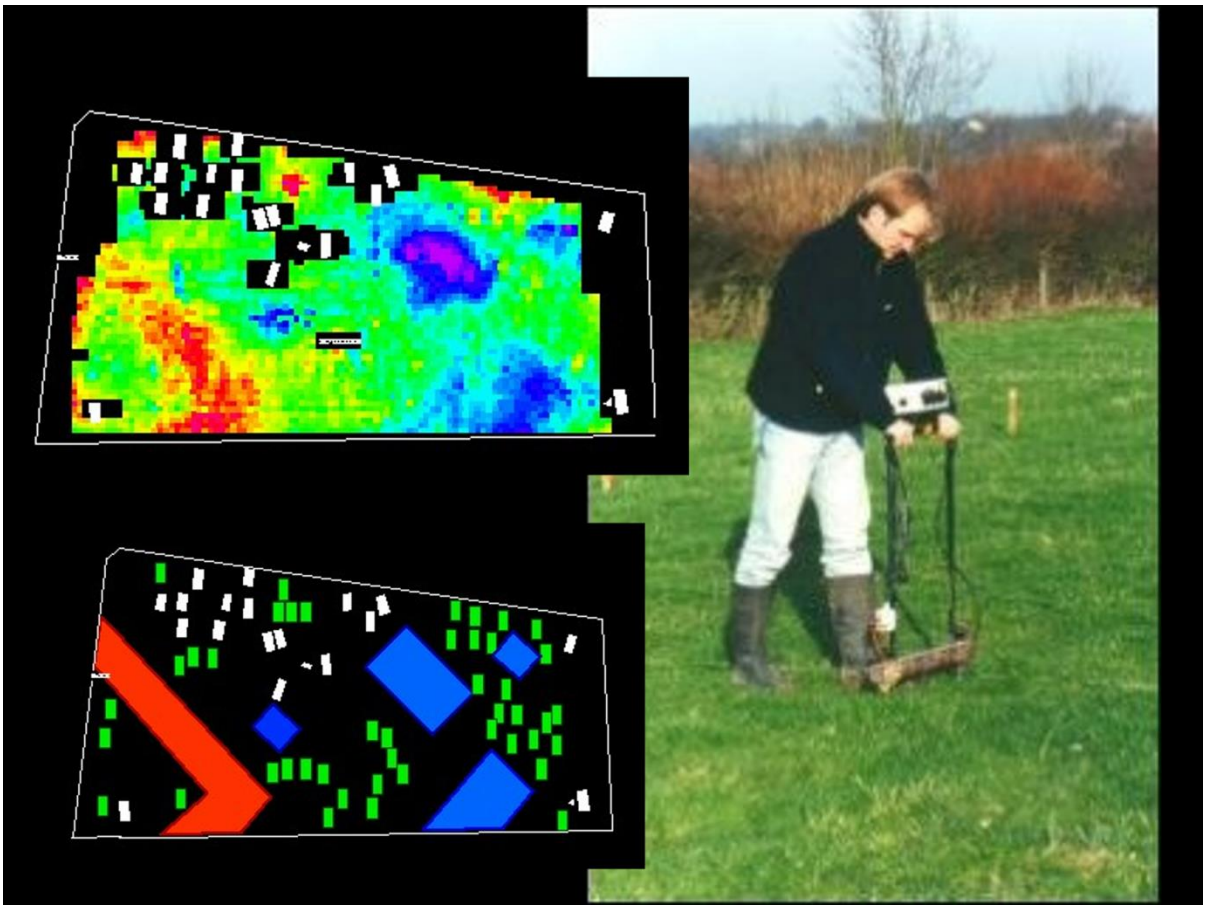


THE AERIAL PHOTOGRAPHY METHOD DEPENDS ON THE PLANT GROWTH OVER THE BURIED STRUCTURES.

TO DETECT THE BURIED STRUCTURES AND FEATURES, WE CAN ALSO USE THE DGROUND PENETRATING RADAR. GPR USES MICROWAVES TO DETECT BURIED FEATURES.

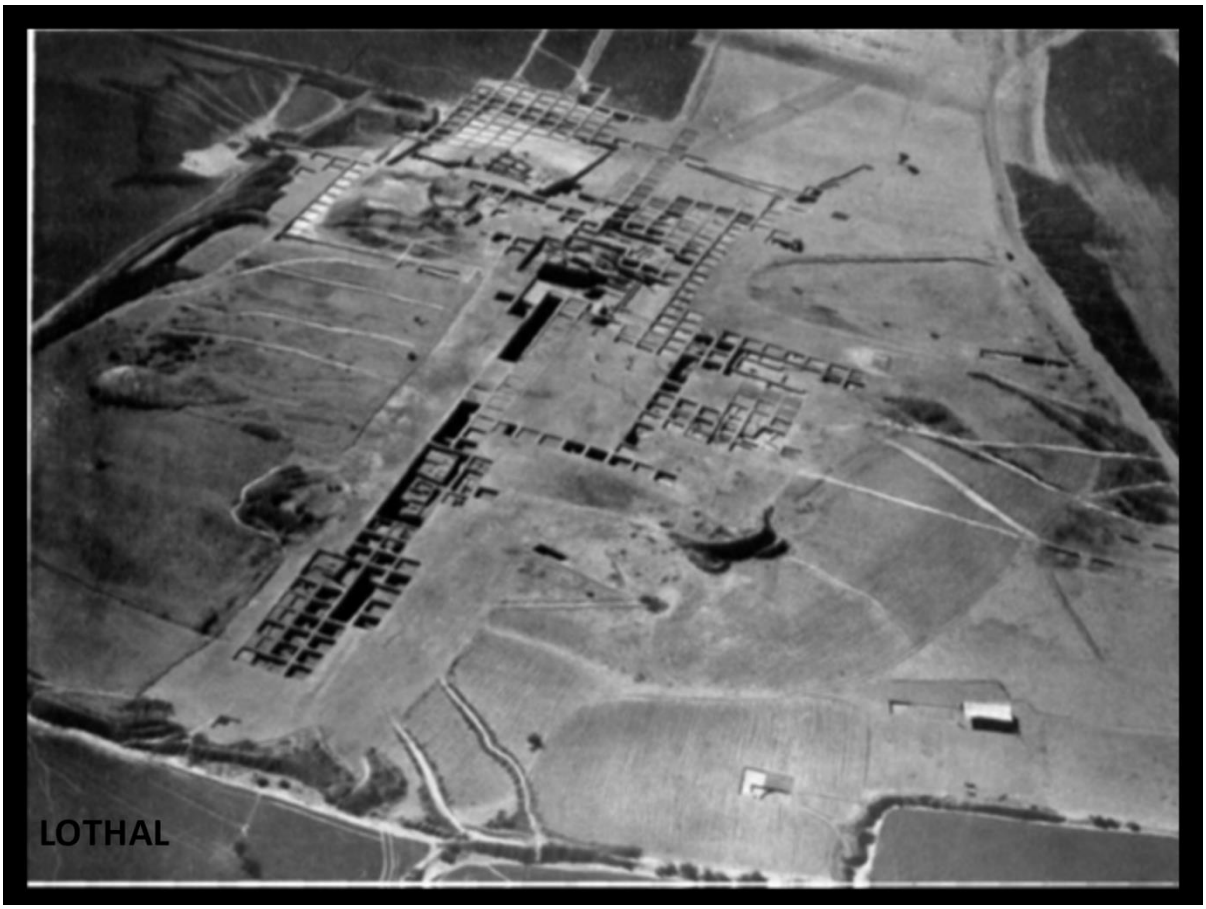


HERE IS AN EXAMPLE OF A BURIAL DETECTED USING GPR. THE HARD MATERIAL LIKE THE STONES REFLECT THE WAVES MORE STRONGER THAN SOFT SOIL.

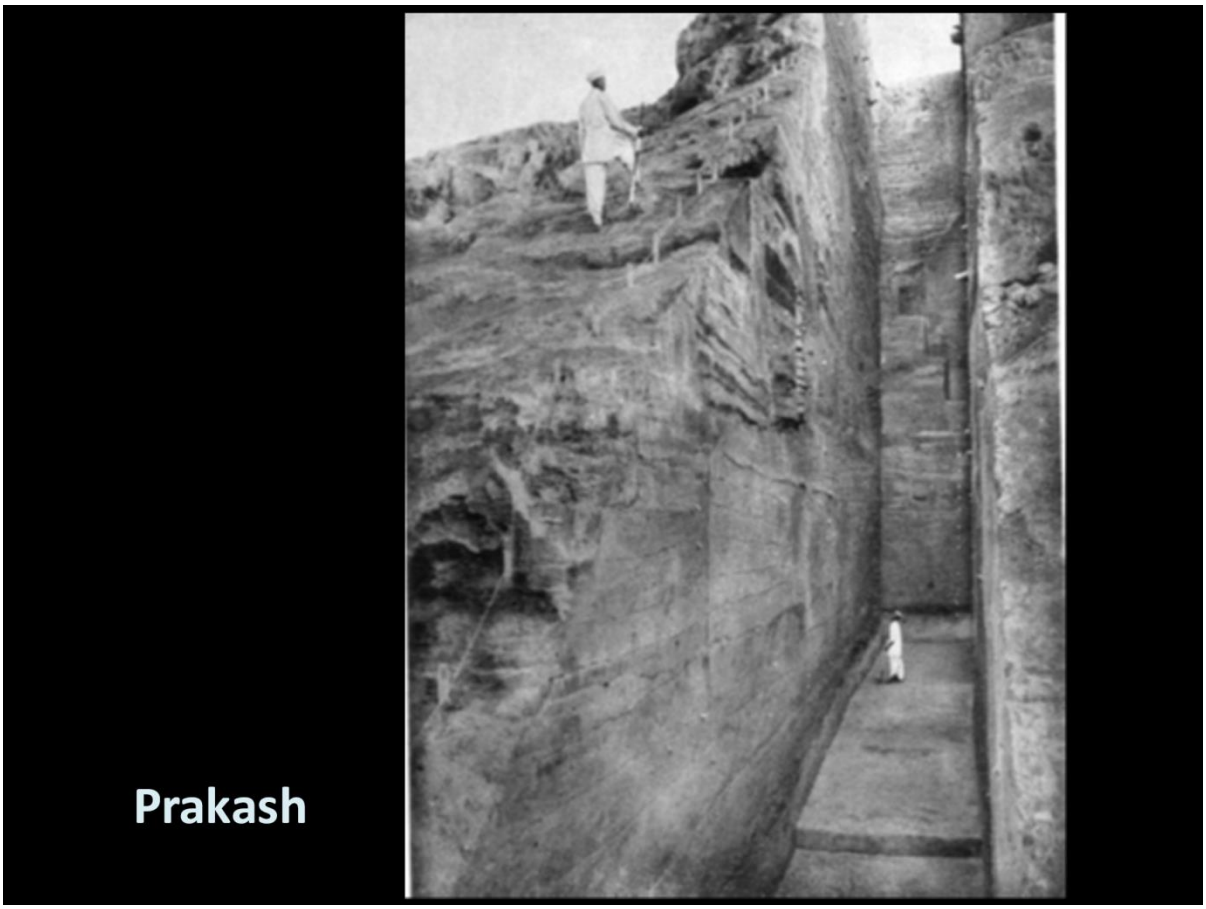


ELECTRICAL RESISTIVITY SURVEY IS ANOTHER METHOD TO DETECT BURIED FEATRUES. THE METHOD USES THE PROPERTIES OF ELECTRICITY, LIKE THE RESISTNCE TO PASSAGE OF ELECTRONS. IN THE EXAMPLE, BURIED GRAVES ARE DETECTED USING ELECTRICAL RESISTIVITY SURVEY.

IN ARCHAEOLOGICAL WORK, EXCAVATION IS AN ESSENTIAL PART. THE ANCIENT FEATURES GET BURIED, AND UNLESS WE EXCAVATE SYSTEMATICALLY, THEY CANNOT TBE REALISED. HERE YOU CAN SEE THE STREET AND ROW OF STRUCTURES REVEALED IN THE EXCAVATED PORTION AT DHOLAVIRA, A HARAPPAN SITE, WHEREAS, IN THE UNEXCAVATED AREA THE STRUCTURES ARE NOT VISIBLE.



SOMETIMES, THE EXCAVATIONS ARE VERY EXTENSIVE COVERING HUGE AREA AS AT LOTHAL IN GUJARAT.



SOMETIMES, THE EXCAVATIONS GO VERY DEEP.

SOMETIMES, WE HAVE TO OPERATE IN DIFFICULT SITUATIONS LIKE IN WATER LOGGED AREAS.

SEARCHING FOR THE ANCIENT SITES IS KNOWN AS ‘EXPLORATION’. WE TAKE HELP OF THE MAPS TO PLAN THE EXPLORATION AND TO DETECT POTENTIAL AREAS.

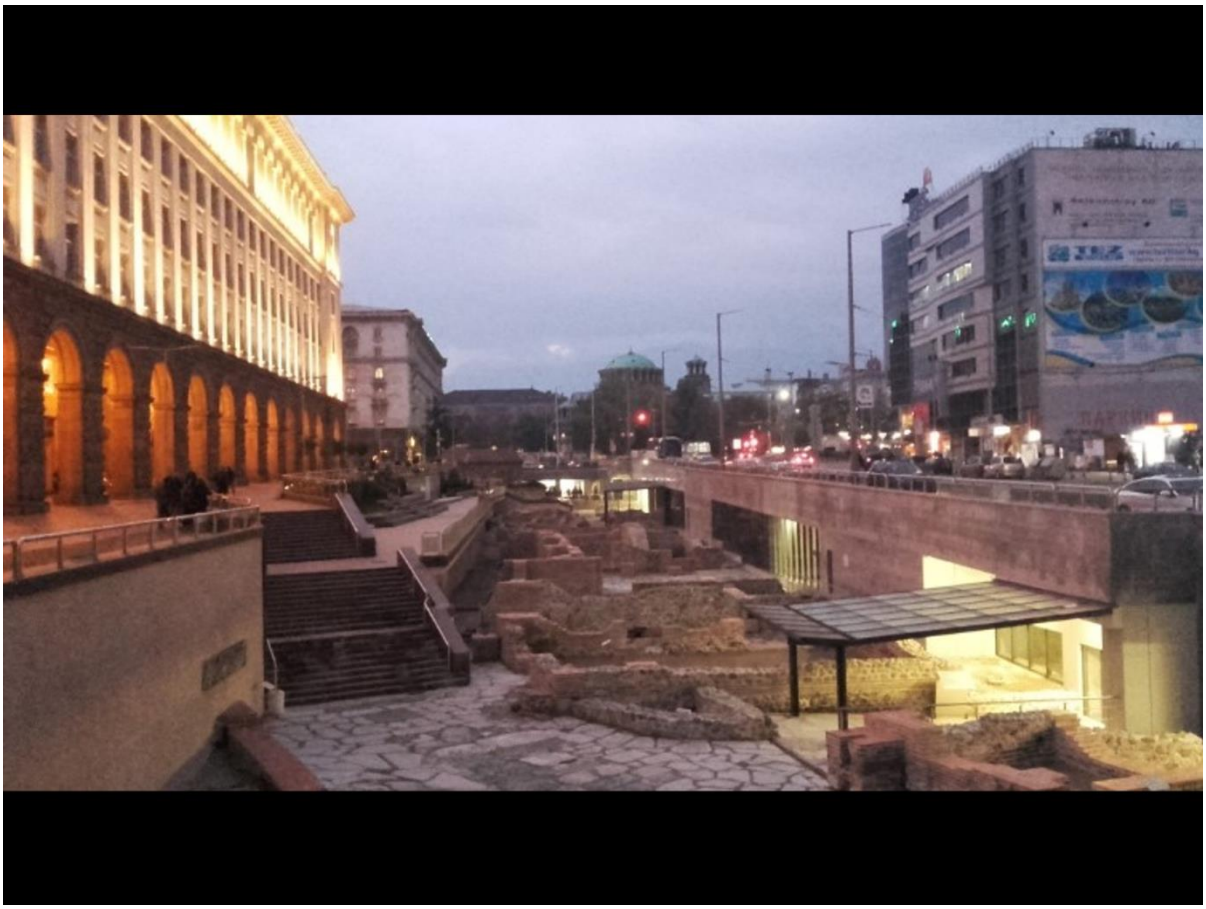
EXCAVATION HAS TO BE CONDUCTED VERY CAREFULLY, SO THAT THE MATERIAL IS NOT DAMAGED AND THE CONTEXT IS NOT DISTURBED.

ALL THE EXCAVATED MATERIAL, INCLUDING THE SKELETAL REMAINS ARE VERY IMPORTANT. HERE YOU CAN SEE A ARCHAEOZOOLOGICAL LABORATORY IN JAPAN, WHERE THE REMAINS ARE STUDIED USING COMPARITIVE MATERIAL.

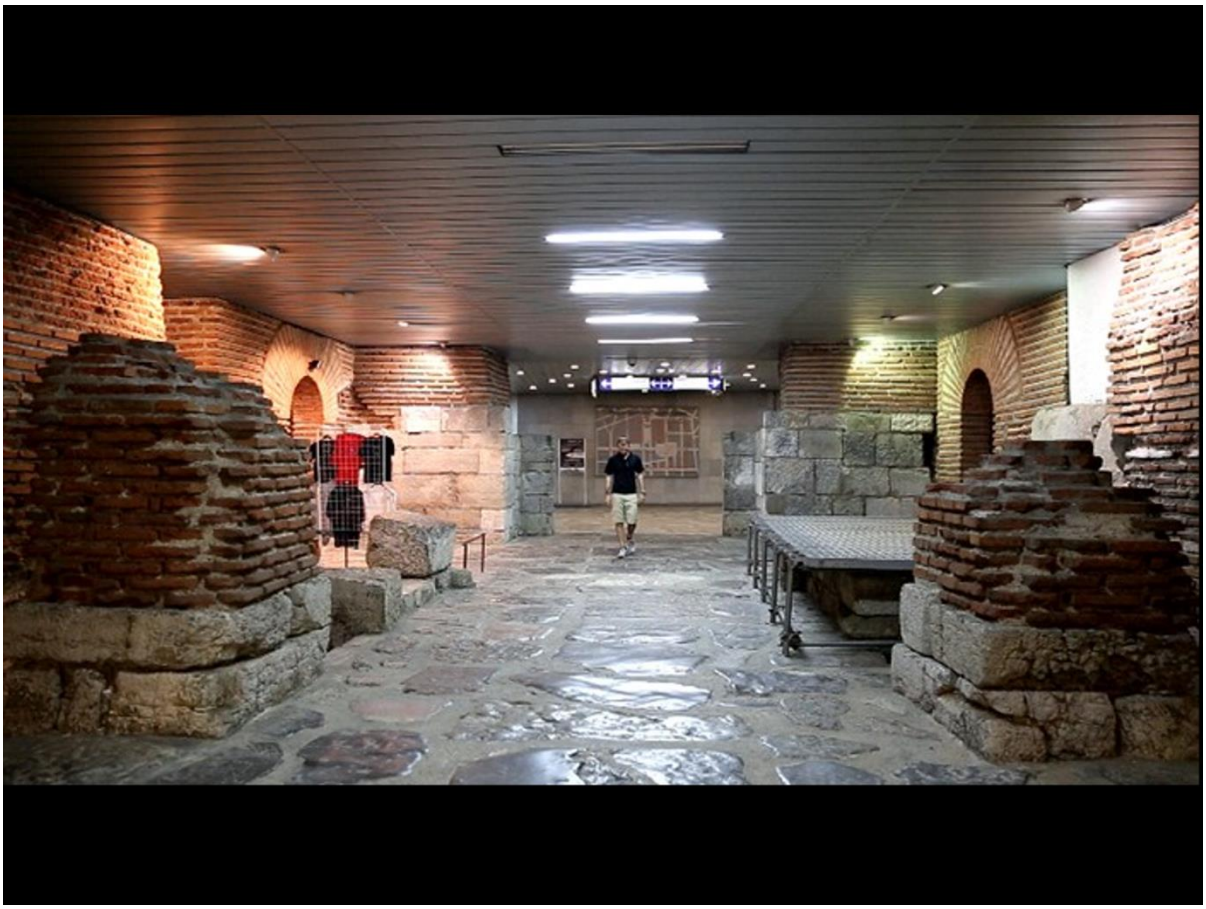
MATERIAL LIKE POTTERY IS CLEANED, NUMBERED, PHOTOGRAPHED AND DRAWINGS MADE IN THE POTTERY LAB.

ANY HABITATION WHERE HUMANS LIVE. HERE, YOU CAN SEE ALEXANDRIA WHERE THE MODERN STRUCTURES CAN BE SEEN OVER THE DEPOSIT CONTAINING THE 3RD CENTURY REMAINS.

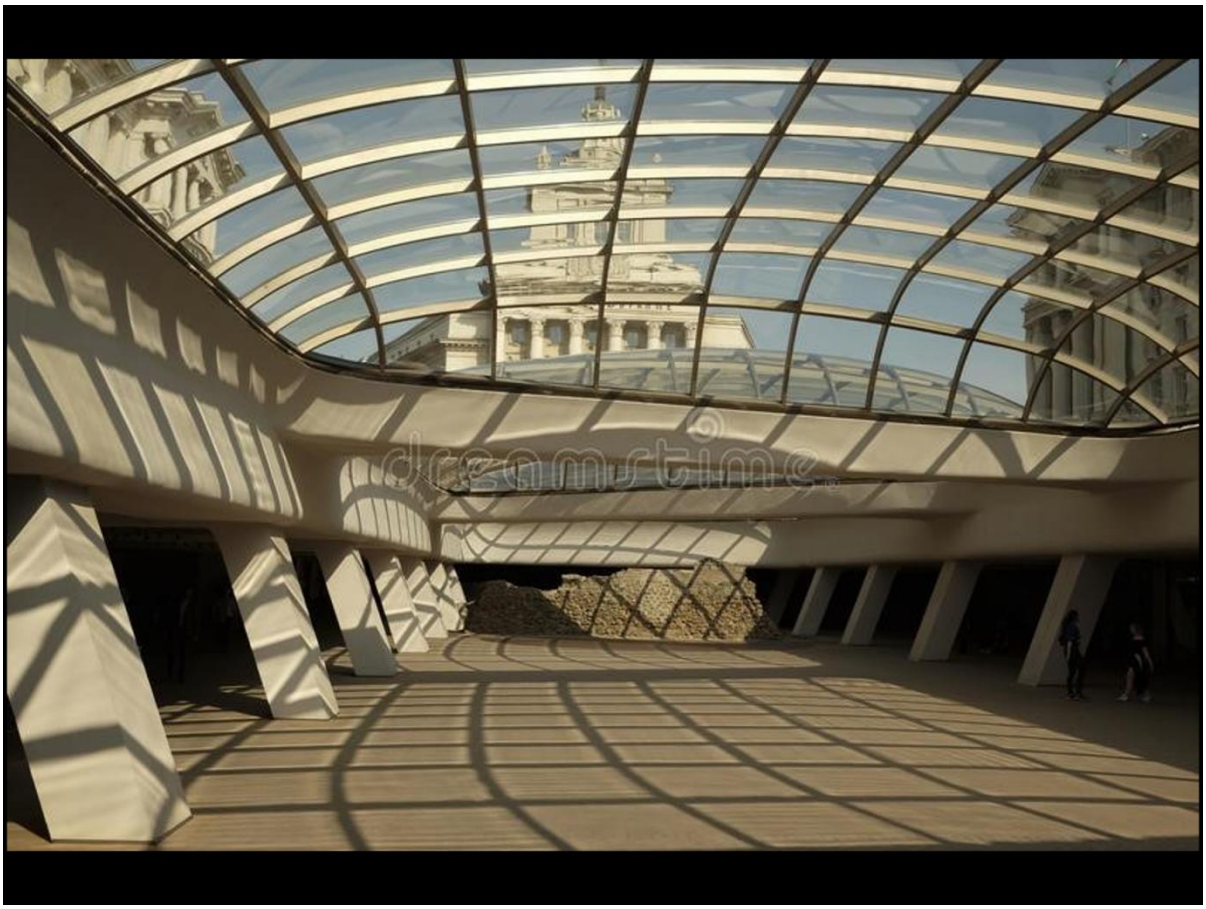

29/10/2009



SOMETIMES, SIGNIFICANT ANCINET REMAINS LIE BELOW IMPORTANT STRUCTURES LIKE PALACES AS SEEN HERE IN THE CENTRE OF SOFIA CITY IN BULGARIA



AFTER EXCAVATION, SOME SITES ARE PRESERVED *INSITU,* THAT IS ‘AT THE SAME PLACE’, HERE, THE MAIN ROAD ALSO HAS BEEN RESTORED AFTER PRESERVING THE REMINS UNDERGROUND.



GLASS DOME FOR NATURAL LIGHTING

SOMETIMES, WE DETERCT THE SITES ON THE BASIS OF SURFACE INDICATIONS.

THE CIRCULAR FORMATION OF THE EMBEDDED STONES INDICATED PRESENCE OF A BURIAL

LAYOUT OF THE SITE IS DONE ON QUADRANT METHOD.

AFTER DIGGING 4 FEET, WE FOUND THE BURIAL WITH SKELETONS, POTTERY AND OTHER REMAINS

HERE ON THE SURFACE, ONLY A REDGRAM CROP WAS VISIBLE. NO INDICATION OF ANY ANCIENT REMAINS. THE ELECTRICAL RESISTIVITY SURVEY INDICATED PIT

ACTIVITY.

THE AREA IS CLEANED AND PEGMARKS PLANTED.

AT ONE FEET DEPTH, DISCOLOURATION WAS VISIBLE

AT ONE AND A HALF FEET, THE PIT IN OVAL SHAPE COULD BE DETECTED.

THE FIRST ANTIQUITY, A STONE POUNDER WAS NOTICED

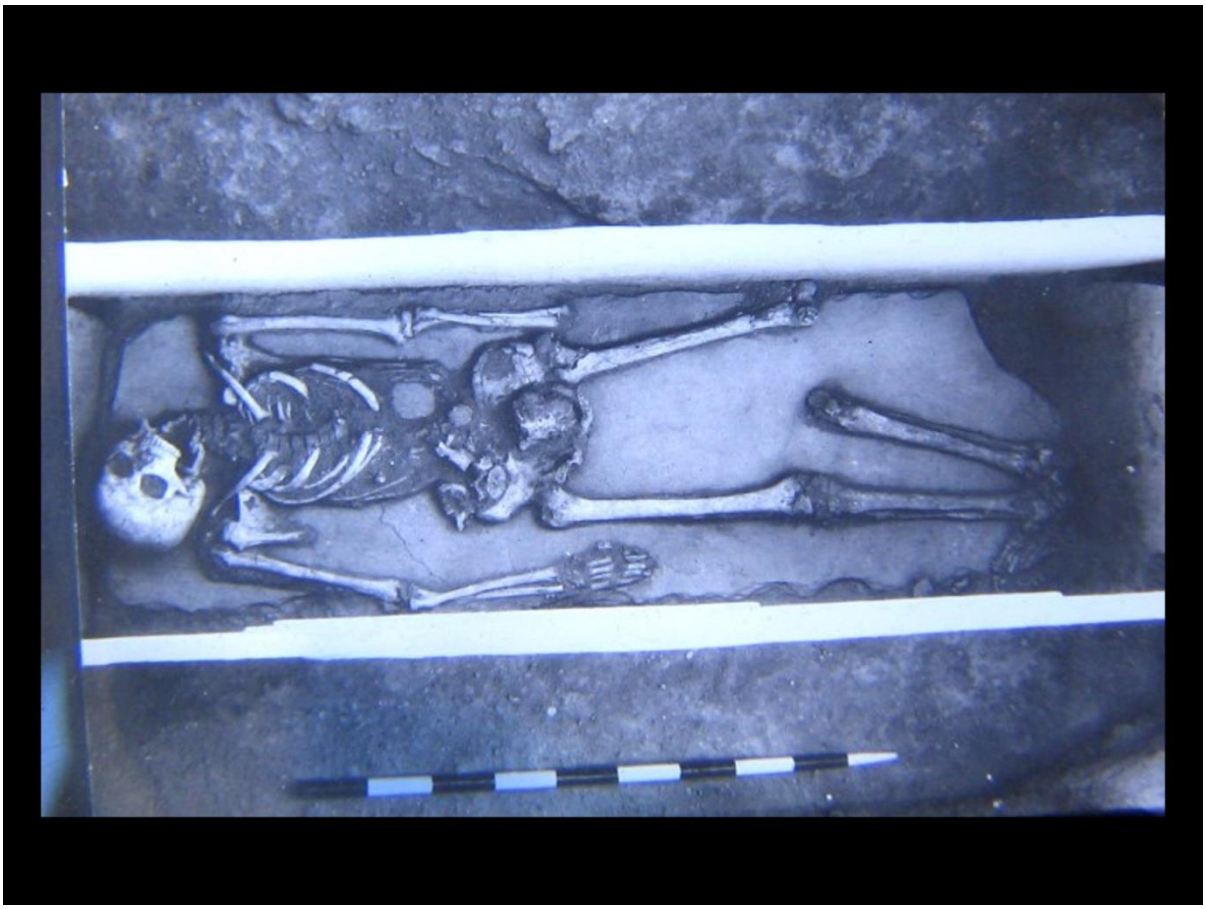
MORE ANTIQUITIES, BURIAL CHAMBER AND PIT OUTLINE COULD BE DETECTED

SIDE VIEW OF THE BURIAL CHAMBER

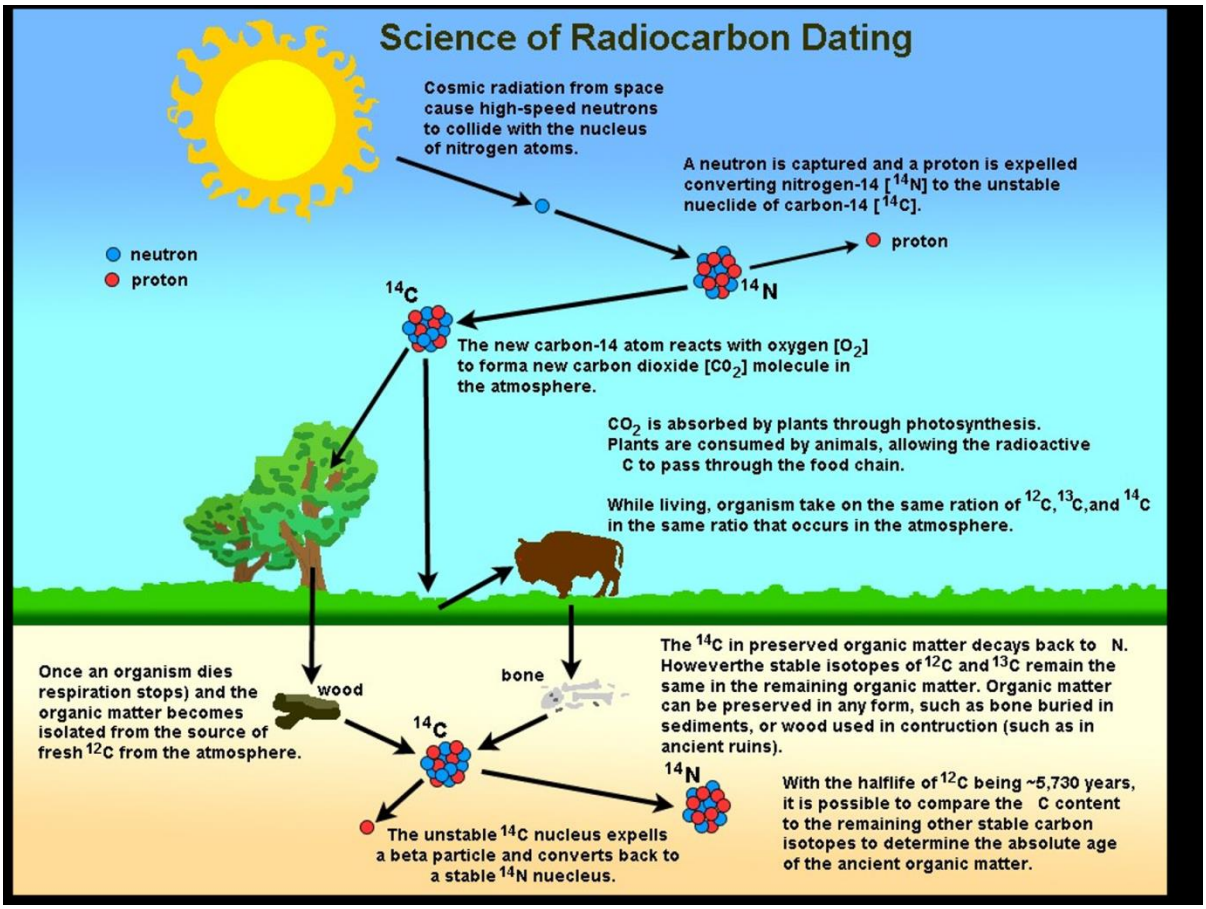
POTTERY, IRON OBJECTS AND SKELETAL REMAINS IN THE BURIAL CHAMBER

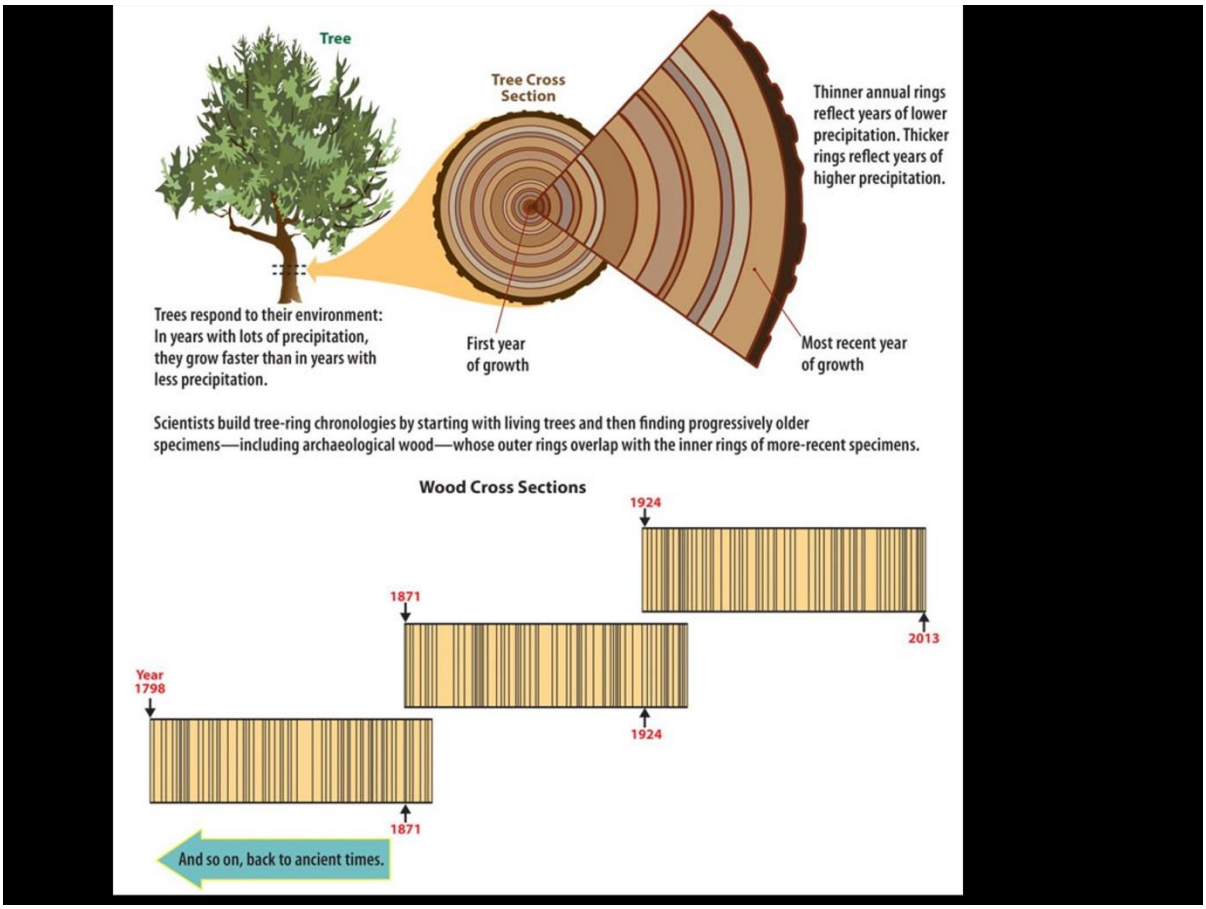
ANTIQUITIES FLOUND IN THE BURIAL

IRON CHISELS, SPEAR-HEAD

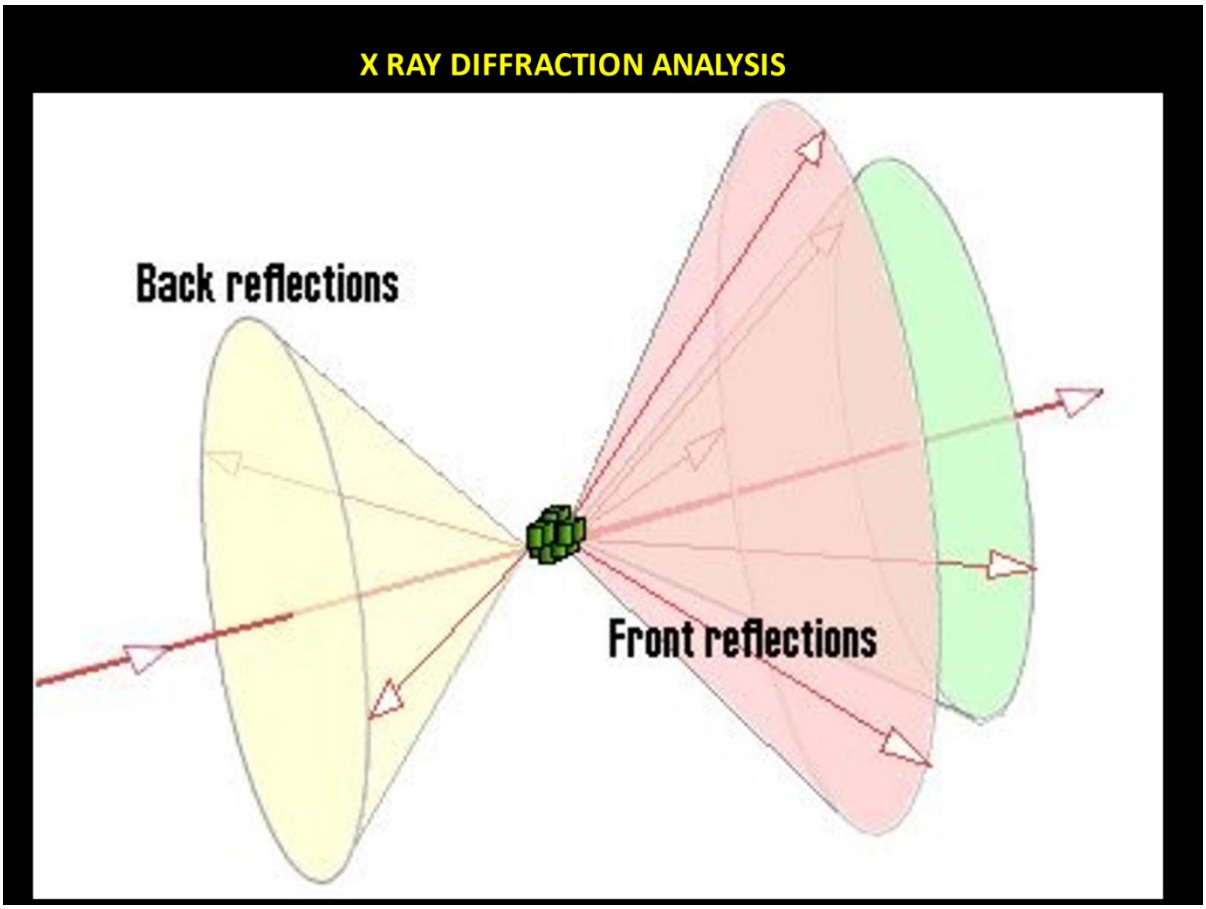


SOMETIMES, INFORMATION COULD BE INFERRED WITHOUT MUCH ANALYSISS. THE SEVERED LEG INDICATES THAT THE PERSON HAS DIED UNNATURALLY, MAY BE IN A FIGHT OR DUE TO AN ANIMAL ATTACK

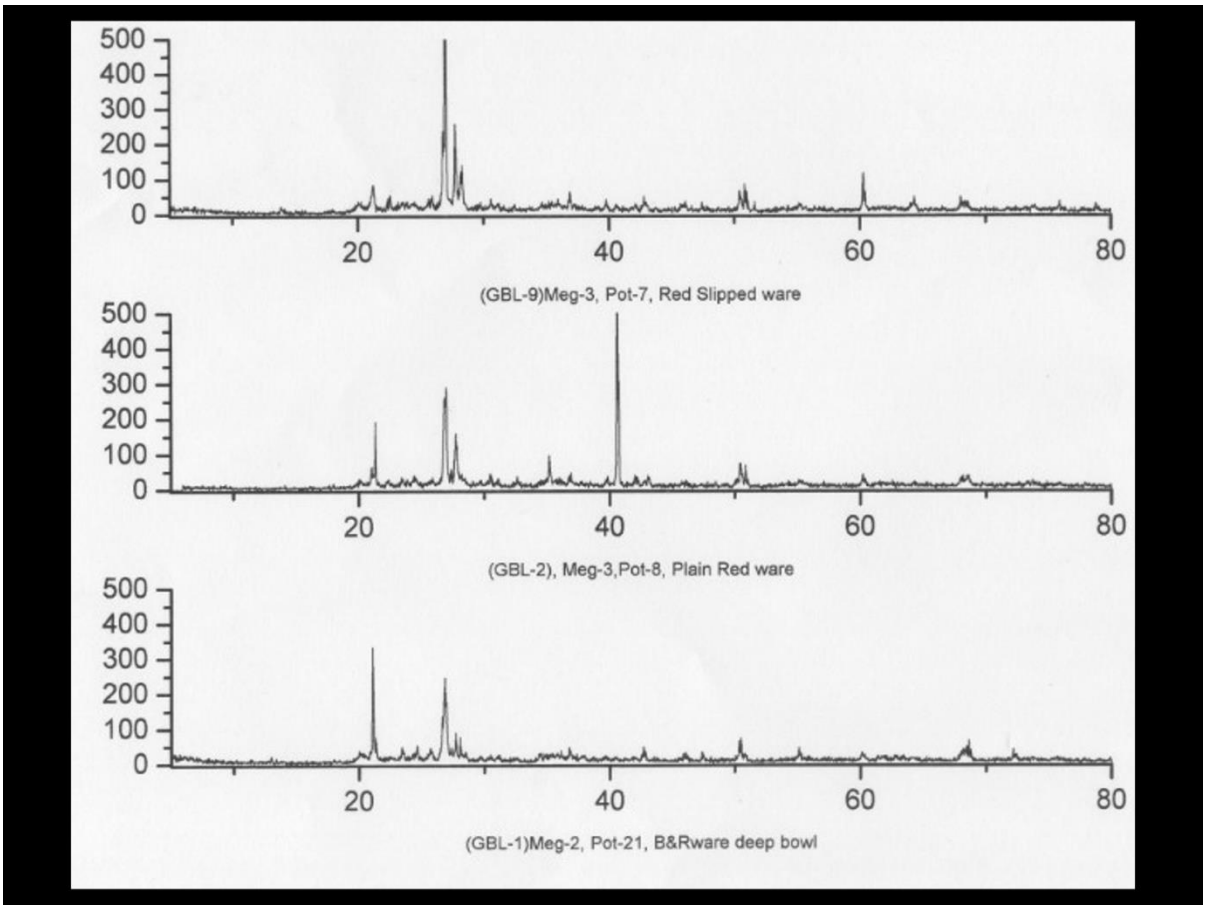

Science of Radiocarbon Dating
Cosmic radiation from space cause high-speed neutrons to collide with the nucleus of nitrogen atoms.
A neutron is captured and a proton is expelled converting nitrogen-14 [^{14}N] to the unstable nueclide of carbon-14 [^{14}C].
neutron
proton
proton
^{14}C
^{14}N
The new carbon-14 atom reacts with oxygen [O_2] to forma new carbon dioxide [CO_2] molecule in the atmosphere.
CO_2 is absorbed by plants through photosynthesis. Plants are consumed by animals, allowing the radioactive C to pass through the food chain.
While living, organism take on the same ration of ^{12}C, ^{13}C, and ^{14}C in the same ratio that occurs in the atmosphere.
Once an organism dies respiration stops) and the organic matter becomes isolated from the source of fresh ^{12}C from the atmosphere.
wood
bone
^{14}C
The ^{14}C in preserved organic matter decays back to N. Howeverthe stable isotopes of ^{12}C and ^{13}C remain the same in the remaining organic matter. Organic matter can be preserved in any form, such as bone buried in sediments, or wood used in contruction (such as in ancient ruins).
^{14}N
With the halflife of ^{12}C being ~5,730 years, it is possible to compare the C content to the remaining other stable carbon isotopes to determine the absolute age of the ancient organic matter.
The unstable ^{14}C nucleus expells a beta particle and converts back to a stable ^{14}N nuecleus.


Tree
Tree Cross Section
Thinner annual rings reflect years of lower precipitation. Thicker rings reflect years of higher precipitation.
Trees respond to their environment: In years with lots of precipitation, they grow faster than in years with less precipitation.
First year of growth
Most recent year of growth
Scientists build tree-ring chronologies by starting with living trees and then finding progressively older specimens—including archaeological wood—whose outer rings overlap with the inner rings of more-recent specimens.
Wood Cross Sections
1924
1871
2013
Year 1798
1924
1871
And so on, back to ancient times.

WHEN DIFFERENT POTTERIES ARE FOUND ON A SITE, WE HAVE TO DETECT, WHETHER ALL THE POTS WERE MADE AT THE SAME PLACE OR WHETHER ANY OF THEM ARE IMPORTED.

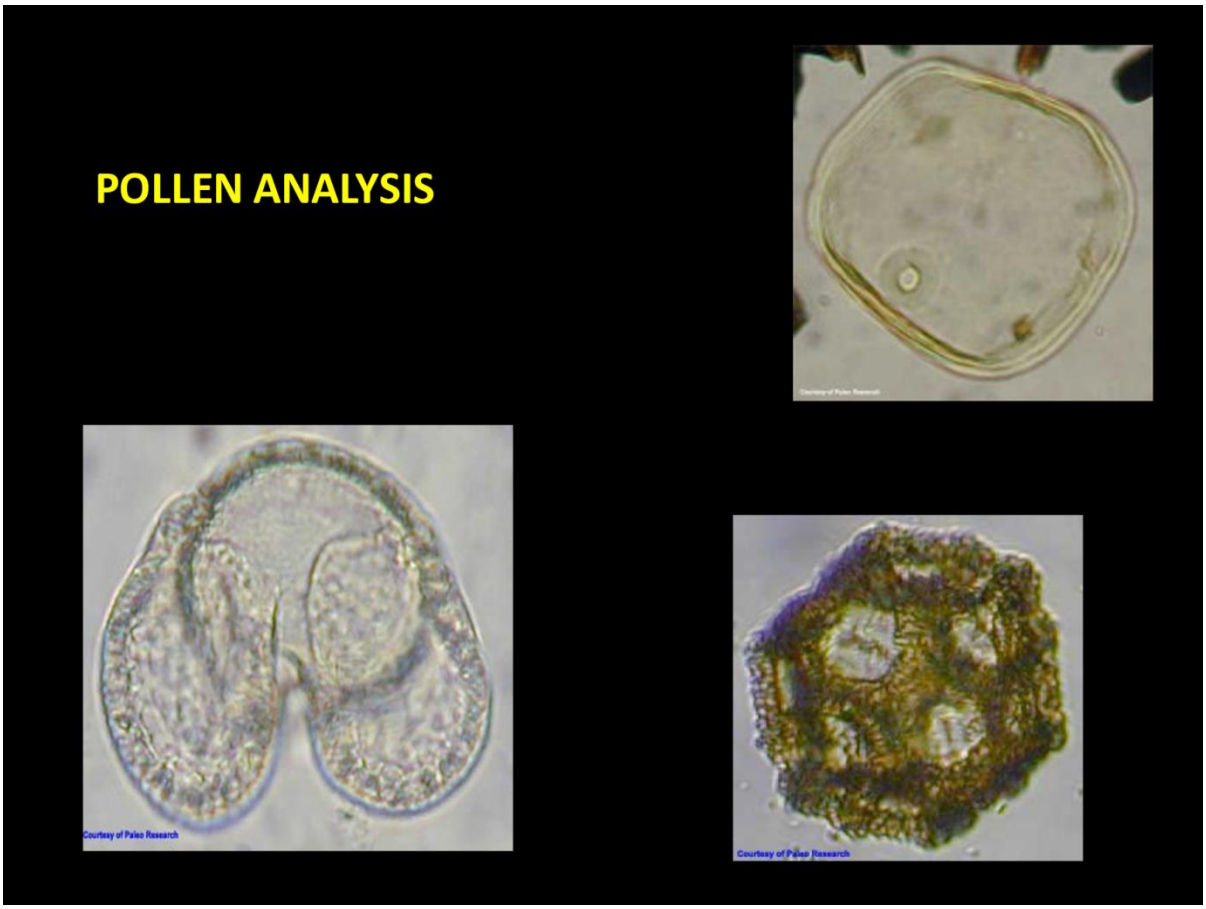


X-RAY DIFFRACTION ANALYSIS IS USED IN DETECTING THE MINERALOGY, WHICH HELPS IN FINDING THE PROVENANCE OF THE MATERIAL.



HERE, WE CAN NOTE THAT THE THREE VARIETIES OF POTS WERE MADE AT THREE DIFFERENT LOCALITIES.

THE POLLEN FROM THE FLOWERS HELP US IN KNOWING THE ENVIRONMENT AND THE AGRICULTURAL PRACTICES



DIFFERENT PLANTS HAVE DIFFERENT POLLEN, WHICH HELPS IN IDENTIFYING THE SPECIES

SOIL FROM THE ANCIENT DEPOSIT IS MIXED IN WATER TO FLOAT THE POLLEN, CHARRED GRAINS AND BOTANICAL REMAINS TO UNDERSTAND THE ECONOMY, FOOD HABITS AND ENVIRONMENT.

THUS LOT OF SCIENCE IS INVOLVED IN RECONSTRUCTING OUR ANCIENT PAST AND IN WRITING HISTORY

ARCHAEOLOGISTS ARE THE ONLY SCIENTISTS WHO DESTROY THEIR OWN LABORATORY.

Archaeologist's Career Lies in Ruins.

THANQ

drkprao@gmail.com
9440375303

INIVITATION

OUR FINAL YEAR STUDENT SHALINI INIVITING THE GUESTS.

Kum. D. APARNA FROM II B.A. GIFTED A SAPLING TO Prof. K. P. RAO

Kum. M. SATYA DEVI FROM I B.A., READING THE PROFILE OF THE GUEST SPEAKER.

PRINCIPAL Dr. A.P.V. APPARAO GARU GIVING HIS OPENING REMARKS.

Dr.KP Rao, Professor, Hyderabad Central University, Giving his key note address

PARTCIPANTS

PRINCIPAL AND FACULTY FACILITATING THE GUEST SPEAKER.

MR. S. SOMA SEKHAR HOD OF HISTORY & TOURISM GIVING VOTE OF THANKS.